[Air Operator's Company Name]

[Aircraft Manufacturer]
[Aircraft Type]

MULTI CREW AIRCRAFT STANDARD OPERATING PROCEDURES

Edition 1
Issued 1 September, 2001

INTRODUCTION

INTRODUCTION

Distribution List Copies

[Insert the distribution list for your company. The following distribution is an example only. Depending on the size of your operation, you may also wish to control individual copies of your SOPs. Note that a copy of the SOPs must be carried on board the aircraft, either by a crew member or as part of the aircraft equipment. If you intend to carry a copy of the SOPs as part of the aircraft library you should indicate the individual aircraft on the distribution list.]

Flight Crew	32
Chief Pilot	1
C FXXX	1
Director of Flight Operations	1
Transport Canada	1
Total	34

Record Of Amendment

No.	Date of Amendment	Date Entered	Entered By
1/2001	initial issue		

INTRODUCTION

List Of Effective Pages

Pages No will differ once corrected

Page No.	Amdt No.	Date
Intro 1	0	Sept 01, 2001
Intro 2	0	Sept 01, 2001
Intro 3	0	Sept 01, 2001
Intro 4	0	Sept 01, 2001
Intro 5	0	Sept 01, 2001
Intro 6	0	Sept 01, 2001
Intro 7	0	Sept 01, 2001
1-1	0	Sept 01, 2001
1-2	0	Sept 01, 2001
1-3	0	Sept 01, 2001
1-4	0	Sept 01, 2001
1-5	0	Sept 01, 2001
1-6	0	Sept 01, 2001
1-7	0	Sept 01, 2001
1-8	0	Sept 01, 2001
1-9	0	Sept 01, 2001
1-10	0	Sept 01, 2001
1-11	0	Sept 01, 2001
1-12	0	Sept 01, 2001
1-13	0	Sept 01, 2001
1-14	0	Sept 01, 2001
1-15	0	Sept 01, 2001
1-16	0	Sept 01, 2001
1-17	0	Sept 01, 2001
1-18	0	Sept 01, 2001
1-19	0	Sept 01, 2001
1-20	0	Sept 01, 2001
1-21	0	Sept 01, 2001
1-22	0	Sept 01, 2001
1-23	0	Sept 01, 2001
1-24	0	Sept 01, 2001
1-25	0	Sept 01, 2001
1-26	0	Sept 01, 2001
1-27	0	Sept 01, 2001
1-28	0	Sept 01, 2001
2-1	0	Sept 01, 2001
2-2	0	Sept 01, 2001
2-3	0	Sept 01, 2001
2-4	0	Sept 01, 2001
2-5	0	Sept 01, 2001
2-6	0	Sept 01, 2001
2-7	0	Sept 01, 2001
2-8	0	Sept 01, 2001
2-9	0	Sept 01, 2001
2-10	0	Sept 01, 2001
2-11	0	Sept 01, 2001
2-12	0	Sept 01, 2001
2A-1	0	Sept 01, 2001
2A-2	0	Sept 01, 2001
2A-3	0	Sept 01, 2001
3-1	0	Sept 01, 2001
3-2	0	Sept 01, 2001
3-3	0	Sept 01, 2001
3-4	0	Sept 01, 2001
3-5	0	Sept 01, 2001
3-6	0	Sept 01, 2001
3-7	0	Sept 01, 2001
3-8	0	Sept 01, 2001
3-9	0	Sept 01, 2001
3-10	0	Sept 01, 2001
3-11	0	Sept 01, 2001
3-12	0	Sept 01, 2001
3-13	0	Sept 01, 2001
3-14	0	Sept 01, 2001
3-15	0	Sept 01, 2001
3-16	0	Sept 01, 2001
3-17	0	Sept 01, 2001
3-18	0	Sept 01, 2001
3-19	0	Sept 01, 2001
3A-1	0	Sept 01, 2001
3A-2	0	Sept 01, 2001
4-1	0	Sept 01, 2001
4-2	0	Sept 01, 2001
4-3	0	Sept 01, 2001
4-4	0	Sept 01, 2001
4A-1	0	Sept 01, 2001
5-1	0	Sept 01, 2001
5-2	0	Sept 01, 2001
5-3	0	Sept 01, 2001
5-4	0	Sept 01, 2001
5-5	0	Sept 01, 2001
5-6	0	Sept 01, 2001
5-7	0	Sept 01, 2001

INTRODUCTION

5-8	0	Sept 01, 2001	7-12	0	Sept 01, 2001
5-9	0	Sept 01, 2001	7-13	0	Sept 01, 2001
5-10	0	Sept 01, 2001	7-14	0	Sept 01, 2001
5-11	0	Sept 01, 2001	7-15	0	Sept 01, 2001
5-12	0	Sept 01, 2001	7-16	0	Sept 01, 2001
5-13	0	Sept 01, 2001	7-17	0	Sept 01, 2001
5-14	0	Sept 01, 2001	7-18	0	Sept 01, 2001
5-15	0	Sept 01, 2001	7-19	0	Sept 01, 2001
5-16	0	Sept 01, 2001	7-20	0	Sept 01, 2001
5-17	0	Sept 01, 2001	7-21	0	Sept 01, 2001
5-18	0	Sept 01, 2001	7-22	0	Sept 01, 2001
5-19	0	Sept 01, 2001	7-23	0	Sept 01, 2001
5-20	0	Sept 01, 2001	7-24	0	Sept 01, 2001
5-21	0	Sept 01, 2001	7-25	0	Sept 01, 2001
5-22	0	Sept 01, 2001	7-26	0	Sept 01, 2001
5-23	0	Sept 01, 2001	7A-1	0	Sept 01, 2001
5-24	0	Sept 01, 2001	7A-2	0	Sept 01, 2001
5-25	0	Sept 01, 2001	7A-3	0	Sept 01, 2001
5-26	0	Sept 01, 2001	7A-4	0	Sept 01, 2001
5-27	0	Sept 01, 2001	7A-5	0	Sept 01, 2001
5-28	0	Sept 01, 2001	7A-6	0	Sept 01, 2001
5-29	0	Sept 01, 2001	8-1	0	Sept 01, 2001
5-30	0	Sept 01, 2001	8-2	0	Sept 01, 2001
5-31	0	Sept 01, 2001	8-3	0	Sept 01, 2001
5-32	0	Sept 01, 2001	9-1	0	Sept 01, 2001
5-33	0	Sept 01, 2001	9-2	0	Sept 01, 2001
5-34	0	Sept 01, 2001	9-3	0	Sept 01, 2001
5-35	0	Sept 01, 2001	9-4	0	Sept 01, 2001
5A-1	0	Sept 01, 2001	9-5	0	Sept 01, 2001
5A-2	0	Sept 01, 2001	9-6	0	Sept 01, 2001
6-1	0	Sept 01, 2001	9-7	0	Sept 01, 2001
6-2	0	Sept 01, 2001	9-8	0	Sept 01, 2001
6-3	0	Sept 01, 2001	9-9	0	Sept 01, 2001
7-1	0	Sept 01, 2001	9-10	0	Sept 01, 2001
7-2	0	Sept 01, 2001	10-1	0	Sept 01, 2001
7-3	0	Sept 01, 2001	10-2	0	Sept 01, 2001
7-4	0	Sept 01, 2001	10-3	0	Sept 01, 2001
7-5	0	Sept 01, 2001	10-4	0	Sept 01, 2001
7-6	0	Sept 01, 2001	10-5	0	Sept 01, 2001
7-7	0	Sept 01, 2001	10-6	0	Sept 01, 2001
7-8	0	Sept 01, 2001	10-7	0	Sept 01, 2001
7-9	0	Sept 01, 2001			
7-10	0	Sept 01, 2001			
7-11	0	Sept 01, 2001			

INTRODUCTION

Table Of Contents

List of Tables

List of Figures

Chapter 1. General

1.1. Introduction

a) These Aircraft Standard Operating Procedures (SOPs) are issued by [operator's company name] for guidance in the operation of [aircraft manufacturer] [aircraft type] aircraft. The SOPs cannot cover all circumstances. However, they are intended to assist personnel to operate aircraft within the limitations of the aircraft flight manual. All personnel are expected to exercise sound judgment and consistency in their application.

b) The greatest advantage of multiple crew members on board an aircraft is that more than one person can contribute to the safety and effectiveness of the operation. In order for individual crew members to contribute as much as they can, they must both meet a standard, and (for the most part) carry out their duties in a standard manner. The SOPs deal primarily with the standardization of how the crew completes their duties. Standardization is one of the most powerful tools available to the crew to prevent the undesirable, to determine when something undesirable is occurring, and to deal with the undesirable should it occur. These SOPs are provided as a part of the standardization tool. However, a standard procedure cannot be devised to cope with all situations. Although the SOPs are to be complied with to the extent practical, there may be situations where compliance with some part is inadvisable. Should it be appropriate to deviate from the SOPs all applicable personnel shall be thoroughly briefed.

c) This chapter contains information of a general nature that applies to several aspects of the operation or does not conveniently fit into the other more specific chapters.

1.2. Application

a) Publications The SOPs supplement and expand on the information contained in numerous publications. In particular the SOPs supplement the following publications:

i) [Aircraft Manufacturer] [Aircraft Type] approved Aircraft Flight Manual (AFM);

ii) [Operator's Company Name] Operations Manual; and

iii) Canadian Aviation Regulations (CARs).

b) Aircraft Flight Manual Every effort has been made to ensure that the SOPs are compatible with the approved Aircraft Flight Manual. The SOPs are designed to promote the coordination of the multiple crew members during operation of [Aircraft Type] aircraft. The SOPs are not intended to replace the Aircraft Flight Manual, but to

supplement it. Therefore, there are many cases where the SOPs detail additional requirements to the AFM.

c) Company Operations Manual Some areas of the SOPs deal with similar subjects that are found in the Company Operations Manual. The SOPs supplement the Company Operations Manual. However, the SOPs detail the procedures specifically for when the aircraft is operated by multiple crew members. Therefore, where a difference exists from the Company Operations Manual, the SOPs shall be followed unless safety is jeopardized.

1.3. Amendment

a) Suggestions for amendment of these SOPs are to be forwarded in writing, to [insert the title of the person to action amendments, ie. Chief Pilot, Operations Manager, or insert the routing that requests are to be sent through] Whether or not a suggestion is implemented, a written reply will be provided to the person who has submitted the suggestion.

b) The Edition Number and date that the edition was issued will be indicated on the cover page. The Edition Number and date will not change with subsequent amendments until a new edition is issued. The edition number will be shown in the header for each page.

c) Amendments will be designated by number and date of issue. Amendment status of each page is indicated at the bottom left of the page. The current amendment status of the entire Standard Operating Procedures document is shown at the "List of Effective Pages" and at the bottom left of the title page. Amendment "0" indicates an not amended or original page. A list of all of the amendments in the current edition is shown at the top of the "List of Effective Pages & Amendment Record." Subsequent amendments will be given sequential numbers. When a new edition is issued, the amendment numbers will begin again at "0." The periodic amendments will replace the cover page, the "List of Effective Pages & Amendment Record", and the pages that have changed. Included with each amendment will be instructions designating the pages to be removed and inserted, as well as a summary of what has changed in the body of the SOPs.

d) When an amendment is issued, it shall be distributed as indicated at the "Distribution List" in the pre-chapter of the SOPs.

1.4. Distribution

[In this section specify who is responsible to ensure that a copy of the SOPs is carried on board the aircraft. Specifically, indicate if a pilot is responsible for this duty or come other person in your organization.]

a) The distribution of the SOPs is shown at the "Distribution List" in the Intro.

b) At least one copy of the SOPs shall be carried on board the aircraft during flight.

1.5. Abbreviations and Acronyms

a) The following abbreviations and acronyms are used in the SOPs. Where the abbreviation or acronym is derived from another document (such as the Aircraft Flight Manual), the reference for that acronym is shown by the title of the publication preceded by the abbreviation "ref." The expanded text for the abbreviation or acronym is shown in this section. For definitions of terms see the Definitions section. Items are sorted in ascending alphabetical order sorted by abbreviation or acronym - vice the expanded text. Generally, the periods "." have been omitted from the abbreviation unless required for clarity.

[The abbreviations, acronyms and expanded text are examples only. A number of them are included only because they have been used in examples in these generic SOPs. The relevant acronyms and expanded text that are used by your organization should be inserted here. However, many of the items shown will apply to your operation. To reduce the likelihood of an incorrect interpretation, we recommend that you include a complete list of any abbreviations and/or acronyms that are used in your SOPs]

ACAS Airborne Collision Avoidance Systems, (ref. AIP) [insert only if your aircraft is so equipped]

AIP Aeronautical Information Publication Canada

AFM Aircraft Flight Manual

APU Auxiliary Power Unit

ASR Airport Surveillance Radar (ref. CAP)

ATC Air Traffic Control, (ref. AIP)

CAP Canada Air Pilot

Capt. Aircraft Captain

CARs Canadian Aviation Regulations

CDU Control Display Unit

CFR Airport Crash, Fire Fighting and Rescue Services (DND) (ref. CAP)

DH Decision Height (ref. CAP)

FE Flight Engineer [insert only if an FE is used on the aircraft]

FA Flight Attendant [insert only if an FA is used on the aircraft]

FAF Final Approach Fix (ref. CAP)

FAWP Final Approach Waypoint (ref. CAP)

FL Flight Level (ref. CAP)

FMS Flight Management Systems, (ref. AIP) [insert only if your aircraft is so equipped]

FO First Officer

FOD Foreign Object Damage

GPS Global Positioning System (ref. AIP)

GPWS Ground Proximity Warning Systems [insert only if your aircraft is so equipped]

HAA Height Above Aerodrome (ref. CAP)

HAT Height Above Touchdown Zone Elevation (ref. CAP)

IAF Initial Approach Fix (ref. CAP)

IAS Indicated Airspeed (ref. AIP)

IAWP Initial Approach Waypoint (ref. CAP)

IF Intermediate Fix (ref. CAP)

ILS Instrument Landing System (ref. CAP)

IMC Instrument Meteorological Conditions (ref. CARs)

INS Inertial Navigation System (ref. AIP)

IWP Intermediate Waypoint (ref. CAP)

KIAS Knots Indicated Airspeed

MDA Minimum Descent Altitude (ref. CAP)

MLS Microwave Landing System (ref. AIP)

NAVAID Navigational Aid (ref. AIP)

N_H High Pressure Compressor/Turbine speed (ref. AFM)

PAR Precision Approach Radar (ref. CAP)

PF Pilot Flying

PNF Pilot Not Flying

RCR Runway Condition Report (ref. AIP)

RNAV Area Navigation (ref. AIP)

RWY or Rwy Runway (ref. CAP)

SO Second Officer [insert only if an SO is used on the aircraft]

SOP(s) Aircraft Standard Operating Procedure(s)

STAR Standard Terminal Arrival (ref. CAP)

TCAS Traffic Alert and Collision Avoidance Systems, (ref. AIP) [insert only if your aircraft is so equipped]

TCS Touch Control Steering (ref. AFM)

V_1 Take-off decision speed, (ref. AFM) [or as per the AFM]

V_2 Take-off safety speed, (ref. AFM) [or as per the AFM]

VAC Volts Alternating Current

V_{app} Approach Speed, (ref. AFM or SOP) [or as per the AFM] [insert only if published in the AFM or if used as part of the SOP]

V_{broc} Best Rate of Climb Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{climb} Single engine zero flap climb speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

VDC Volts Direct Current

V_{fe} Maximum Flap Extend Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{fri} Flap Retraction Initiation Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

$V_{go\ around}$ Go Around Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{le} Maximum Landing Gear Extended Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{lo} Maximum Landing Gear Operating Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

VMC Visual Meteorological Conditions (ref. CARs)

V_{mc} Minimum Control Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM

V_{mca} Minimum Control Speed Air, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{mcg} Minimum Control Speed Ground, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{mo} Maximum Operating Limit Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

VNAV Vertical Navigation

V_{ne} Never Exceed Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_r Rotation Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{ref} Final Approach Reference Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

VS Vertical Speed

V_s Stalling speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

VSI Vertical Speed Indicator (ref. Instrument Procedures Manual)

V_{so} Stalling Speed in the landing configuration, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{sse} Safe Single Engine Speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{xse} Best single engine angle of climb speed, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

V_{yse} Best singe engine rate of climb, (ref. AFM) [or as per the AFM] [insert only if published in the AFM]

1.6. Definitions

a) The following are selected definitions. Although other meanings may apply to some words or terms, the definition indicated applies in this manual. Where the definition is derived from another document (such as the Aircraft Flight Manual), the reference for that definition is shown by the title of the publication preceded by the abbreviation "ref." Where a commonly used abbreviation or acronym applies, it will be shown with the definition.

b) There are a number of items that have more than one term, title, or name applied to them. In such cases the terms that are found in official or semi-official documents are used in these SOPs. Nevertheless, some items have different terms in the CARs/CAP/AIP and the AFM. In such cases both terms will be used in the SOP. However, most verbal commands and calls will use the term from the AFM.

[The terms and definitions shown here are examples only. The terms that are used by your organization should be inserted here. In particular the definitions that are used in this section are to be consistent with your Aircraft Flight Manual. Most of the items shown will apply to your operation.]

Abnormal Bank For the purpose of these SOPs, Abnormal Bank is a bank angle of more than 30^{o} that has not been briefed to occur.

Abnormal Rate of Descent For the purpose of these SOPs the following are Abnormal Rate of Descent situations:

a) 1. During an instrument final approach, an unplanned and/or not briefed descent rate of more than 1000 FPM.
b) 2. During unpressurized flight with passengers on board, other than on an instrument final approach, a descent rate of more than 500 FPM.

Abnormal Speed For the purpose of these SOPs the following are Abnormal Speed situations:

a) 1. Within 5 KIAS [or MPH if applicable] below the maximum allowable airspeed (V_{mo}, V_{ne}).
b) 2. More than 5 KIAS below or more than 10 KIAS above the briefed or target airspeed on an instrument approach (V_{app}), or for any situation where a specific airspeed is required such as an engine out procedure.

Aircraft Flight Manual (AFM) (ref. CARs) Is the manual furnished by [operator's company name] that meets the requirements specified in the CARs for the operation of the [aircraft manufacturer] [aircraft type]. For these SOPs the AFM is the [name and stock/manual number of Flight Manual, Pilot's Operating Handbook, or other document].

NORMAL PROCEDURES

[The following definition may need to be modified for your type of aircraft, operating environment, or company policy.]

Altitude Deviation For the purpose of these SOPs an Altitude Deviation occurs when the aircraft is at or beyond the limits described in the following situations:

a) 20 ft below or 60 ft above an MDA;

b) 40 ft below or 100 ft above: any other minimum altitude on an instrument approach once that altitude has been achieved; or a published maximum and/or minimum altitude other than a MDA (such as an altitude specified on some foreign procedures with a bar above and below an altitude);

c) 3. 200 ft above or below an en route altitude once that altitude has been achieved.

This definition should not be considered as condoning deviations from altitudes. It is merely a tool to be used to trigger a coordinated crew action to correct an undesirable situation.

Approach In these SOPs, "Approach" means the arrival at an aerodrome and includes: Instrument Approaches, Visual Approaches, Contact Approaches, Circuits, Circling from an Instrument Approaches, and Landings

Area Navigation (RNAV) (ref. TP2076E Instrument Procedures Manual) A method of navigation that permits aircraft operation on any desired course within the limits of station-referenced navigation signals or within the limits of a self contained system capability, or a combination of these. Navigation systems that provide RNAV capability include (but are not restricted to) VOR/DME (RHO/THETA), DME/DME (RHO/RHO), LORAN C, GPS, OMEGA, INS/IRS, FMS.

ATC Heading A heading issued by ATC that the aircraft is to turn to and maintain. May be part of a vector and may include a speed and/or an altitude.

ATC Speed A speed issued by ATC that the aircraft is to maintain. May be part of a vector and may include a heading and/or an altitude.

Captain (Capt.) The person assigned as "in-command" of an aircraft during flight.

Crew Member (ref. CARs) A person assigned to duty in an aircraft during flight time.

Co-Captain A person carrying out the duties of captain under supervision of the "pilot-in-command."

Co-pilot The flight crew member occupying the [right (aeroplanes) or left (rotorcraft)] pilot seat regardless of who is the Captain or who is in control of the aircraft [or insert the company or AFM definition].

First Officer (FO) The person assigned as the "second-in-command."

NORMAL PROCEDURES

Flight Crew Member (ref. CARs) A crew member assigned to act as a pilot or flight engineer of an aircraft during flight time.

Flight Engineer (FE) The flight crew member occupying the Flight Engineer seat.
The person assigned as the Flight Engineer during flight.

Full Power The maximum power available as limited by the engine controls themselves when they are set to their absolute maximum limit of travel. This definition should not be considered as condoning the setting of engine power that is not approved in the AFM. It is a tool to facilitate crew coordination for setting of all available power as a final resort to prevent an accident.

Glide Path (ref. Instrument Procedures Manual) A descent profile which is electronically determined for vertical guidance during a final approach. The term Glide Path is used in a number of official and semi-official documents, such as: CARs, CAP, Instrument Procedures Manual. In this manual it is used interchangeably with the term "Glide Slope."

Glide Slope Has the same meaning as "Glide Path." The term "Glide Slope" is primarily found in technical manuals such as the AFM.

Heading Deviation For the purpose of the SOPs a Heading Deviation is an apparent deviation from the assigned or briefed heading of more than 5^{o}.

May Indicates permission.

Maximum Continuous Power (ref. AFM) The maximum power that may be used without time restriction.

Maximum Power [or if applicable "Maximum Take-off Power", use the AFM definition for the aircraft type] (ref. AFM) The maximum power that may be used during a take-off in the event of a failure of a power plant, or if required in other circumstances. The power setting is time limited to [insert the AFM time limit (normally 5 minutes)].

Must Primarily mandatory; may be used in a permissive sense.

Non-Precision Approach (ref. CARs) An instrument approach by an aircraft using azimuth information (only).

Pilot

a) 1. The flight crew member occupying the [left (aeroplanes) or right (rotorcraft)] pilot seat regardless of who is the Captain or who is in control of the aircraft [or insert the company or AFM definition].

b) 2. A flight crew member authorized to operate the flight controls of an aircraft.

Pilot Flying (PF) The pilot or copilot that is (see "Aircraft Control"):

a) 1. taxiing the aircraft or,

b) 2. during flight, operating the flight controls directly or through the [autopilot, autoflight system, or flight management system; insert the term(s) that your operation or AFM uses].

Pilot Not Flying (PNF) The pilot or copilot that is not taxiing the aircraft or operating the flight controls see pilot flying).

Practicable Physically possible.

Practical Available or useful.

Precision Approach (ref. CARs) An instrument approach by an aircraft using azimuth and glide path information.

Ranking Crew Member The Ranking Crew Member for any situation is the highest ranking of the following who is present and not incapacitated (listed in order of decreasing rank): Capt., FO, FA in charge, FE, FA (other than in charge), Other crew member. [Amend this definition to suit your operation.]

Required Visual Reference (ref. CARs) Required visual reference, in respect of an aircraft on approach to a runway, means that section of the approach area of the runway or those visual aids that, when viewed by the pilot of the aircraft, enable the pilot to make an assessment of the aircraft position and rate of change of position, in order to continue the approach and complete a landing.

Second Officer (SO) The person assigned as "third-in-command."

Shall Indicates an imperative. Compliance is mandatory (similar to "will"). Note that the use of the imperative "shall" requires caution. Its usage is only effective if the object applies in all cases. For example, issuing a directive using the imperative "shall" that applies in normal but not in abnormal situations would be inappropriate. In most cases, use of the term "should" is more appropriate.

Should Indicates an obligation. Compliance is expected but not mandatory.

Take-off Power (ref. AFM) The power setting to be used for a normal take-off or go-around. The standard call is "Set Take-off Power."

Will Indicates that compliance is mandatory (similar to "shall").

1.7. Notes, Cautions, and Warnings

a) Some information that requires emphasis is expanded upon in the form of a note, caution, or warning. The usage of each and method of display follow.

[If your AFM has definitions for notes, cautions, and warnings, either use the AFM definitions or ensure that the SOPs definitions are consistent.]

NOTE

Expands on information which has already been provided

CAUTION

Provides information to prevent damage to equipment

>> WARNING <<

Emphasizes information of immediate flight safety importance

1.8. Units of Measure

a) Unless otherwise specifically stated the following units of measure (and their abbreviations) are used in these SOPs and are to be used during the operation of [aircraft type] aircraft:

[The units of measure shown here are examples only. The units of measure that are used by your organization should be inserted here. In particular, the units of measure that are used in this section are to be consistent with your Aircraft Flight Manual. However, most of the items shown will apply to your operation.]

i) Airspeed: Indicated Airspeed in Knots, (KIAS) [or MPH specified in the AFM or by your company];

ii) Altimeter Setting: Inches of Mercury, (In Hg);

iii) Altitudes, elevations, heights: Feet, (ft, or '), note that heights Above Sea Level (ASL) or Above Ground Level (AGL) imply feet as the unit of measure;

iv) Distances:

a) Navigation: Nautical Miles, (NM);

b) Pay calculation: Statute Miles, (SM);

c) Visibility: Statute Miles, (SM);

d) Short distances (ie. runway length): Feet, (ft, or ');

e) Very short distances (ie. weight and balance calculation): Inches, (in., or ") [or millimeters (mm) if specified in your AFM];

v) Fuel:

a) Volume: Liters, (L);

b) Weight: Pounds (LBS) [or Kilograms (Kg) if specified by your company];

vi) Horizontal Speed: Knots, (KTS);

vii) Temperature: degrees Celsius, (^{o}C);

viii) Vertical Speed: Feet Per Minute, (FPM)

1.9. Checks, Checklists, and Drills

a) General Checks, Checklists, and Drills have been developed for the operation of the [insert aircraft type] aircraft to ensure that the required actions are not inadvertently omitted or completed in an inappropriate sequence. In this manual a check is a series of actions; a checklist is the physical written document that is associated with the check. A drill is a check for an abnormal or emergency situation that requires immediate action and is therefore, carried out from memory without reference to the checklist. Copies of the abbreviated checklists are found in annexes following the applicable chapter. The checklists are expanded upon in the body of the chapters. If a check forms part of a procedure where crew coordination is required, the items comprising the check will be included in the table describing the procedure. The individual check items will be the on the first line of each of the cells that describe a portion of the procedure. The expanded procedure is divided into columns of PF and PNF actions. Therefore, the references in the checklist to PF and PNF are not shown in the expanded procedures. The expanded checklists provide additional detail (if applicable) for each checklist item. The abbreviated form of the checklists are found on [insert whether abbreviated checklists are on cards, a quick reference handbook, or both, or whatever is used for this type of aircraft] that shall be carried onboard the aircraft.

b) Completion of Checks and Drills All checks and drills once initiated shall be carried out in the sequence that they are listed until complete. No items may be deleted nor the order be altered. If it is necessary to interrupt a check or drill, the person saying the Challenge or the Action shall indicate the item that the check is being held at by stating "Holding at (item)." Should the crew lose track of the progress of the check then the check must be re-started from the beginning or commenced from the last item known to

be completed. Check and drills are not to be completed from memory unless indicated. Generally, the only memory procedures are for emergency drills that require immediate action; and checks that are typically done in a high workload environment where a memory procedure would be advantageous.

c) Checklist Verbal Procedures When saying a check item or response, the specific wording in the checklist shall be used. Whenever a specific quantity is involved, that quantity shall be stated in the response, eg. "Flaps 15 set." When more than one crew member is required to respond, the standard sequence shall be: Pilot, Co-pilot, FE, cabin crew. An example for a challenge as to whether harnesses are secure would be responded to as follows: "Pilot secure", "Co-pilot secure", "FE secure", "Cabin secure."

d) Situational Awareness Checks and drills are specified as either verbal or non-verbal. Verbal checks are so designated to further the situational awareness of and to provide a measure of monitoring by other crew members. Situations may arise where it is more desirable to silently carry out a specific check or drill that is normally done verbally. In such a situation the Captain or PF may direct that a specific check or drill be carried out silently. The applicable crew member will then verbally state only when the check is complete.

e) Crew Members Assigned to Complete Checks The actions required to be carried out during a check are normally assigned to a specific crew member (indicated in the checklist by (PF), (Co-pilot), (FE) and so on). However, situations may arise where it is inadvisable for the assigned crew member to carry out the action. In such cases the Captain may assign another crew member to complete the task. When a check or portion of a check is assigned to a crew member other than as indicated in the checklist, all flight crew members are to be clearly apprised of the assignment.

f) Layout of Checklists Checklists are laid out using the following conventions:

[The following are the conventions that are used for checklists in these generic SOPs. The conventions that your organization uses may differ. However, they should be described here.]

i) The title block is printed at the left margin with the title in bold, underlined, uppercase text. Any symbols (such as bullets) are to the left of the title by two spaces. Any direction about who is to read the check may be printed in bold face type and enclosed in brackets two spaces to the right of the main title. An example follows:

• **BEFORE LANDING CHECK (Challenge and Response)**

ii) To the extent practical, the actual text of labels that are found on switches or controls are used in the checklists. If a label is available for the setting or position that a switch or control is to be moved to, the actual text of the setting or position is used in the checklist. When the actual text of a label is used in a checklist it is printed in uppercase type. When other than the actual text of a label is used, the item is printed in standard title format, ie. first character uppercase and remaining characters lower case. Any symbols (such as bullets, 24 hour check indicators) are to the left of the item by two spaces.

iii) The subject or target of the desired action is shown at the left side of the checklist in normal type (not bold).

iv) The action to be taken is shown on the right side of the checklist in bold face type.

v) The items on the left and the items on the right side are joined by dot leaders.

vi) When a specific person must carry out an action or, if an action can only be carried out from a specific seat, the requirement is indicated by the person/position shown in normal face type enclosed in brackets at the centre of the line, ie. (Co-pilot) or (PNF).

g) Types of Checks and Drills The checks and drills for the [aircraft type] are divided into two primary categories: Abnormal/Emergency Procedures, and Normal Procedures.

i) The Abnormal and Emergency checks and drills are found in the second part of the checklist document and can be differentiated from the normal checks by [insert the method used to differentiate Abnormal Checks and Drills, ie., different colour of paper or red tabbed pages]. The Abnormal and Emergency checks and drills are expanded upon and discussed in the chapter dedicated to those procedures.

ii) The checks for Normal Procedures can further be divided as follows:

a) Non-verbal checks These checks are completed silently with or without reference to the printed checklist. The following are the Non-verbal Checks for the [insert aircraft type] aircraft. All checks are to be completed verbally.

[Typically, the external before flight check, the flight deck geographic check, and the internal before flight check, would be non-verbal checks.] [Insert the names of the non-verbal checks for your type of aircraft.]

(1) Pre-external Check;

(2) External Check;

(3) Internal Check;

(4) Flight Deck Geographic Check (Pilot);

(5) Flight Deck Geographic Check (Co-pilot);

(6) Flight Deck Geographic Check (FE).

b) Verbal Challenge and Response Checks These checks require participation by two or more crew members. [Insert the checks for your type of aircraft that are challenge and response] are challenge and response checks. Challenge and Response checks are indicated by the words "(Challenge and Response) in the title block of the check. The challenge portion of these checks is not done from memory unless specifically indicated by a large bullet "●" in the title block for the check or by a medium bullet "●" next to an item. Checks that are done from memory are done in the same manner as non-memory checks except that the challenge is issued from memory. Challenge and Response checks are typically completed in the following manner:

(1) The check is called for by the PF (ie. "Before Start Check").

(2) The PNF [or FE] acknowledges by repeating the name of the check (ie. "Before Start Check").

[Some aircraft operate with three pilots, or two pilots and a FE. For such aircraft it is required to describe the method used to determine who is to say the challenge portion of which check. This may be done by a statement in the SOPs or by an indication in the title block of the checklist itself.]

(3) The PNF [or FE] says the challenge item on the left side of the line on the checklist.

(4) The responder carries out the required action, then says the appropriate response which is found on the right side of the line. The responder is assumed to be the PF unless otherwise indicated on the checklist line. Due to the construction of the aircraft or due to company policy, it may be necessary that an item be completed by a person other than the PF. In such a case that person would complete the item and say the appropriate response.

(5) At the completion of all items of the check the PNF [or FE] will say the name of the checklist and that it is complete (ie. "Before Start Check complete").

c) Verbal Action and Confirmation Checks These checks do not require the challenge of other crew members. The checks are carried out by one person either from memory or by reference to the checklist. Verbal Action and Confirmation Checks are indicated by the lack of the words "(Challenge and Response)" in the title block. The title of the person that is to carry them out is shown in the title block as either (PNF) or (FE). Checks that are to be carried out from memory are indicated with a large bullet "●" in the title block for the check. Verbal Action and Confirmation Checks are typically completed in the following manner:

(1) The check is called for by the PF.

(2) The PNF [or FE] says the action on the left side of the checklist line.

(3) The PNF [or FE] carries out the required action then says the applicable confirmation on the right side of the checklist line.

(4) At the completion of all items of the check the PNF [or FE] will say the name of the check and that it is complete.

1.10. Aircraft Control

a) General It is absolutely essential that during all phases of ground and flight operation, all flight crewmembers clearly understand which pilot has control and is therefore the Pilot Flying (PF). In most cases it is quite obvious which pilot is the PF. However, during some phases of flight and, in particular, during some emergency situations, it is not so apparent. Such situations are discussed in the relevant areas of the SOPs. For situations not covered in the SOPs the Captain shall specifically advise the flight crew of who is the PF. Whenever control is passed from one pilot to the other, the pilot relinquishing control must provide the pilot assuming control with any relevant aircraft performance information. Such information could include current or target altitude, airspeed, heading, autopilot status, and navigation status.

b) Assumption of Control The Captain may assume control at any time. When advised that the Captain is assuming control the FO shall relinquish control immediately. Notwithstanding the previous, the FO shall assume control when necessary to protect the safety of the aircraft. It may be necessary for the FO to take control to avoid

collision when there is inadequate time to properly communicate the requirement to the Captain or due to pilot incapacitation.

c) Transfer of Control – PF Initiated When the PF initiates transfer of control the following procedure shall be used:

i) the pilot relinquishing control will say "You have control";

ii) the pilot relinquishing control will retain control until;

iii) the pilot assuming control says "I have control."

d) Transfer of Control – PNF Initiated When the PNF initiates transfer of control the following procedure shall be used:

i) the pilot assuming control will say "I have control";

ii) the pilot relinquishing control will say "You have control" and will release control.

1.11. Crew Coordination

a) General In any multi-crew operation, crew coordination is vital to the safe and effective accomplishment of all flights. The Captain has overall responsibility for the safety and success of the operation. This fact does not absolve the other crew members from their responsibility for doing all that is reasonable to improve safety and enhance the operation. An individual crew member's responsibility does not stop at the boundary of the job description for that position. Rather it extends to any area of the operation that the crew member comes in contact with. Flying in a multi-crew environment is unquestionably a team effort. No single member is any less, or any more valuable than any other. During periods of high workload or high stress, it may be very difficult to ensure that critical information is assimilated and acted upon appropriately. It is the responsibility of the crew collectively and individually to ensure that critical information is passed, understood, and acted upon in a manner that fits the situation.

b) No crew member need fear retribution for making an input with the intent of improving the operation.

c) Harassment in any form in response to a crew member attempting to improve the operation will not be tolerated.

d) Crew coordination is a theme that is dealt with throughout these SOPs. Almost every section contains some direction or discussion pertaining to crew coordination. The information on crew coordination that is contained in this particular section does not fit

into other sections and/or is sufficiently broad in application that it is more appropriate to place it here, in a general area.

e) Procedures Description Procedures and the crew coordination involved are detailed in tables distributed throughout these SOPs. The tables are in two or more vertical columns, dependent on the number of flight crew that are involved in the procedure. Each action is contained in a single lateral row and contains all of the actions and verbal calls of the relevant crew members. The situations are aligned with the left margin. The actions to be taken are shown with a dash "-" and indented one tab stop. Any verbal calls are treated as actions and are distinguished by being enclosed in brackets.

f) Abnormal and Emergency Procedures The crew coordination for Abnormal and Emergency situations is discussed in the chapter dedicated to those procedures.

g) Procedures – Common to All Crew Members To the extent that their duties permit, all flight crew members are to monitor other crew members in the performance of their duties. Any deviation or omission by a person is to be brought to the attention of that person as soon as practicable. It is in the interest of safety and efficiency that all flight crew members have as high a situational awareness as is possible. Therefore, any action that is taken by one crew member that may be relevant to other crew members shall be brought to their attention. It should be noted that activities that superficially appear to apply only to an individual crew member, in fact, have at least indirect or perhaps delayed relevance to other members of the crew.

h) Flight Deck Absences Flight crew who leave the flight deck during flight are to advise the remaining flight crew member(s) of the expected duration of their absence. Upon return to the flight deck the member is to be briefed of any changes including but not restricted to:

i) Current ATC agency and frequency,

ii) Changes to the ATC clearance,

iii) Changes to speed, altitude, heading, and navigation aid or control status,

iv) Changes in altimeter setting,

v) Changes in engine power setting,

vi) Changes in flight control to or from autoflight.

i) Flight Relief [If your operation does not make use of Flight Relief delete this section. If your operation does make use of flight relief, insert the pertinent details of crew

coordination for assumption, transfer, and relinquishment of flight crew duties at one of the flight crew stations.]

1.12. Communication

a) General To foster crew coordination and to avoid misidentification and misinformation in dealing with outside agencies (such as ATC), the crew must communicate effectively. To improve the likelihood that information is passed correctly or that a deviation from the desirable is detected, much of the communication that goes on must be standardized in content and phraseology. Specific direction as to the exact wording to be used and related actions, is located throughout the SOPs. The information on communication that is contained in this section does not fit into other sections or is sufficiently broad in application that it is more appropriate to place it here, in a general area.

b) Intercom Usage [Specify when the intercom is to be used for your type of aircraft and operation. For some aircraft it may be appropriate to communicate using the intercom only during some abnormal procedures. For others, the ambient noise level may be such that the pilots are only able to communicate using the intercom. In order to avoid confusion specify the usage.]

c) Public Address System [If your aircraft is equipped with a Public Address (PA) System, specify the occasions that the flight crew and other crew are to use it. Obviously, it is not possible to specify all situations. However, some minimum communications requirements should be specified.]

d) Radio Procedures – Crew Duties For normal operations both VHF radios should be monitored by all flight crew members. During normal operations the PNF is to make any radio transmissions. During abnormal operations, in the absence of the PNF, when the PNF is engaged in other duties, or should the Captain deem it appropriate, the PF will make any required radio transmission. Which agency is being addressed on each radio shall be made clear to each flight crew member. For example if No. 1 VHF was previously used for communication with Ground Control and the PNF is now using No. 2 VHF to communicate with Tower, that change shall be brought to the attention of the remaining flight crew members.

e) Radio Procedures – Call Sign In any transmission to ATC or non-company station the flight crew shall use the full company call sign and flight number. The following is an example of acceptable transmission:

i) "Winnipeg Centre, Transport One Five Niner [insert company call sign and flight number], level at 3000."

ii) When using the aircraft registration as the call sign, the procedures described in the AIP shall be followed.

f) Aircraft Internal Communication Any operational communication whether on the intercom or normal voice shall be acknowledged by the recipient. Although it is not possible to specify all appropriate responses, the following list covers the bulk of situations:

i) "Check" is used to acknowledge situational information. For example should the PNF advise that the aircraft has descended to within 100 ft of the desired IAP MDA. The appropriate response from the PF would be a simple acknowledgement of "Check". "Check" should be the most frequently used form of acknowledgement.

ii) "Roger" is used where it is advantageous to indicate understanding as part of the acknowledgement.

g) Standard Phraseology The following standard phraseology should be used for communications during aircraft operations.

i) Altimeter Setting When saying an altimeter setting, the decimal is omitted but all of the digits are included and the unit of measure is included, eg., 29.89 In Hg is read as "two niner eight niner inches."

ii) Crew Duty Stations When referring to matters that pertain specifically to the seat occupied by a flight crew member the terms used shall be those described in the "Definitions" section of this chapter, eg., "Two niner eight niner inches set pilot".

iii) Command When referring to matters that pertain specifically to command of the aircraft, the terms used shall be those described in the "Definitions" section of this chapter regardless of the seat occupied. Specifically, the terms "Captain or First Officer" shall be used.

[For the following subsection "Conversation on the Flight Deck" insert the particulars of your company policy or modify the following to suit your type of aircraft.]

h) Conversation on the Flight Deck and Non-operational Radio Transmissions During the following periods, no conversation is permitted other than that required for assigned work or for the operation of the aircraft. During the same periods no non-operational radio transmissions are permitted.

i) From engine start to top of climb or 10000 ASL/FL100, whichever occurs first;

ii) During descent, from 10000 ASL/FL100, or top of descent, whichever occurs last; until the aircraft has stopped at the completion of the flight;

iii) During the handling of any abnormal situation.

[For the following subsection "Radio Transmissions to Company Organizations" insert the particulars of your company policy or modify the following to suit your type of aircraft.]

i) Radio Transmissions to Company Organizations No transmissions to company organizations are permitted during the following periods:

i) From taxi on to any active runway or take-off/landing area until the completion of the after take-off check;

ii) From the beginning of the before landing check to until clear of any active runway or take-off/landing area;

iii) During an abnormal or emergency situation except as required to deal with that situation.

j) Transmissions to company organizations are to be made as follows:

i) [insert radio communications that are required to be made to company organizations].

1.13. Standard Calls – General

a) 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 have been established. Standard Calls are defined and referred to throughout the SOPs. The following are calls that have broad application or are not specifically dealt with elsewhere in this manual. The calls are listed in alphabetical order by the situation that requires the call. Terms that are underlined are defined in the "Definitions" section of this chapter. The standard calls pertaining to altitude are in the section titled "Standard Calls Altitude" which is found later in this chapter.

i) 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.

ii) 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.

iii) 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.

iv) 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). The PF should turn the aircraft to achieve the heading and state the following as applicable. If a speed change is required see ATC speed below. If an altitude change is required see the section on Standard Calls Altitude. These calls would be combined as required.

a) "Turning to xxx^{o} " if a turn is required;

b) "Steering xxx^{o} " if no turn is required;

v) 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." If a heading change is required see ATC Heading above. If an altitude change is required see the section on Standard Calls Altitude. These calls would be combined as required.

vi) 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.

vii) Full Power To command the setting of Full Power call "Set Full Power." The PNF should then set the engine controls to the limit of their travel to obtain the absolute maximum power available, and respond "Full Power Set." This setting should be used only in the direst of situations.

viii) Heading Deviation Upon observing a Heading Deviation, the PNF should call "Heading." The PF should respond with "Check, correcting"and correct the aircraft 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.

ix) 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.

x) 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, xx Torque Set." [This power setting may be the same as that which would be permitted with power uptrim if your aircraft is so equipped. Or, it may be the same as take-off power. This item should be deleted if it does not apply to your aircraft.]

xi) 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 for a normal take-off as specified in the AFM and respond "Take-off Power, XX Torque Set."

1.14. Standard Calls – Altitude

[To some extent the calls for altitude management depend on the particular equipment, operating environment, and company policy. The following is a guide only. You will need to develop procedures for your own operation.]

Similarly to the General Standard Calls, some standard calls are designated that apply specifically to altitude. The purpose of these calls is to reduce the likelihood of inadvertent deviation from a desired altitude or missing of a target altitude. Underlined terms are defined in the "Definitions" section of this chapter.

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

c) 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 to those described in the "Departing an Altitude" subsection. The calls for approaching an altitude that is part of an Instrument Approach Procedure are found in the chapter pertaining to Normal Flight Procedures Arrival.

d) 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.

e) 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."

f) Instrument Approaches For Instrument Approaches the guidance for standard calls, including altitude related calls, is found in the chapter pertaining to Normal Flight Procedures Arrival.

g) FL100/10000 ASL Procedures for climbing and descending through Flight Level 100 or 10000 ASL are found in the applicable chapters for Normal Procedures Departure and Normal Procedures Arrival.

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

1.15. Barometric Altimeter Setting Procedures

The procedures in the following paragraphs should be followed for setting of altimeters in various circumstances:

[These are suggested procedures for setting of barometric altimeters. If your company already has procedures that differ, there is probably no reason to change. Merely document your procedures in this subsection.]

a) When receiving an altimeter setting that is either new or unchanged from another agency by radio, the applicable flight crew member should read that altimeter setting back to the agency. An example follows.

   i) "Transport One Five Niner [replace with company call sign and flight number] checks we are cleared to 4000, altimeter two niner eight niner."

b) For transition between the Standard and Altimeter Setting Regions the PF should call "Transition, set 2989 inches." If the PF is occupied with other duties and does not call for an altimeter setting at transition, the PNF or FE should make that call. Once the call at transition is made, the procedure in the next paragraph and following table should be used.

c) When a new altimeter has been received for transition between the Standard and Altimeter Setting Regions, or when the checklist calls for a verification of the altimeter setting, the following procedure should be used to set or confirm the aircraft altimeters.

Note that the order indicated is to be used regardless of whether the PF is the pilot or co-pilot.

[If your aircraft is equipped with a standby altimeter, indicate which crew member is to set it. Also indicate if there are times when company policy permits setting the standby altimeter or any other altimeter to a different setting than that being used to fly the aircraft. For example, some operators set the standby altimeter to the local altimeter at top of descent while the aircraft is still in the Standard Pressure Region, but leave the primary altimeters set to 29.92 In Hg until transition.]

Table 1-1 Standard Calls – Altimeter Setting

Pilot	Co-pilot	Flight Engineer (FE)
Set altimeter new setting, or confirm setting of 29.89 In Hg. – State "2989 inches set Pilot."	Set altimeter new setting, or confirm setting of 29.89 In Hg. – State "2989 inches set Co-pilot."	Set altimeter new setting, or confirm setting of 29.89 In Hg. – State "2989 inches set Engineer."

1.16. Altitude Alert

[If your aircraft is not equipped with an Altitude Alert System delete this section. Depending on the how your aircraft is equipped it may be necessary to add to or delete from this section.]

a) General The Altitude Alert System shall be used to the extent possible to prevent the aircraft from occupying other than the desired altitude. Procedures applicable to specific phases of flight are found in the relevant chapters throughout the SOPs. See also the section titled Standard Calls Altitude found earlier in this chapter.

b) Altitude Alert Setting Other than as specified elsewhere in these SOPs the following procedures should be used for setting the Altitude Alert system:

i) If in autoflight, the PF should set required altitudes in the Altitude Alert System, arm the Flight Guidance System, and advise the remaining flight crew.

ii) If in manual flight, the PNF should set required altitudes in the Altitude Alert System, arm the Flight Guidance System (if it is in use), and advise the remaining flight crew.

c) Altitude Confirmation The pilot who responds on the radio to an Air Traffic Control initiated altitude should confirm that the Altitude Alert System has been set appropriately or confirm the existing setting if no change is required. [Delete the next sentence if your aircraft is not appropriately equipped.] If an altitude change is required, the pilot who responded on the radio shall also confirm that the Flight

Guidance System vertical mode appropriately set or armed. Whenever an altitude setting is changed or confirmed the pilot taking the action shall advise the other flight crew.

1.17. Radio Altimeter Procedures

[If your aircraft is not equipped with a Radio Altimeter delete this section. This example caters to a single or dual Radio Altimeter Installation that has the following characteristics:
- can have an alert set independently at both the Pilot and Co-pilot positions,
- has individual digital displays to the pilot and co-pilot,
- is unable to resolve to the nearest foot, ie able to resolve to the nearest 5 ft or 10 ft,
- has an alert setting range that is less than the display range of the Radio Altimeter.

It will be necessary to write procedures based on the individual installation in your type of aircraft. However, the following areas will probably apply.]

a) General The purpose of the procedures described in this section is to reduce the likelihood of inadvertent flight into terrain. These procedures should be adhered to unless a specific situation dictates a different procedure. In the event that these procedures are deviated from, the flight crew shall be fully briefed.

b) Common Procedures Unless unserviceable, both pilots shall have Radio Altitude and related alerting information continuously displayed. Unless desirable due to a special circumstance, both pilots Radio Altimeter Alert Height should be set to the same value.

c) Category I Precision Approach Procedures The Radio Altimeter Alert Height should be set to the HAT that corresponds to the DH for the approach flown. If the HAT does not correspond to an even increment for the Radio Altimeter Alert both pilots should set their Alert Height to [choose one of the following based on consideration of aircraft equipment and company policy: the nearer increment, the next lower increment, the next higher increment]. In no case is the radio altimeter be used to determine the DH.

d) Category II/III Precision Approach Procedures [If your operation does not do Category II or III Precision Approach Procedures delete this section.] The procedures for use of the Radio Altimeter(s) for Category II and Category III Precision Approach are found in the chapter that deals with Normal Flight Procedures Arrival.

e) Non-precision Approach Procedures For Non-precision approaches the Radio Altimeter Alert Height for both pilots should be set to [insert company policy]. In no case is the radio altimeter be used to determine the MDA.

[For Non-precision approaches there are a number of possibilities for setting of alert heights. Some of the options and considerations are:
- set to the HAA/HAT that corresponds to the approach being flown;

- set the Required Obstacle Clearance for the approach being flown (this option has some advantage for approaches which have very high HAA's or HAT's, particularly if the HAA/HAT is above the setting range for the alert);
- set a specific value based on company policy, equipment limitations, or type of operation;
- if the selected height does not correspond to an even increment for the Radio Altimeter Alert it should be specified which of the following is to be set: the nearer increment, the next lower increment, the next higher increment.]

f) Procedures for other than Instrument Approaches For en route operations the Radio Altimeter Alert for both pilots should be set to [insert company policy, eg. 500 ft, 1000 ft, 1500 ft]. [If applicable specify procedures for special operations such as aerial work.]

1.18. Flight Guidance Systems and Navigation Systems

[Depending on the how your aircraft is equipped it may be necessary to add to or delete from this section.]

a) General To the extant practical, the Flight Guidance and Navigation Systems and Displays for each pilot are to be set up similarly. The purpose of this directive is to make more apparent a deviation from the desired. Similarly, it is necessary that both pilots maintain as high a degree of situational awareness as possible. This objective is fostered by one or both pilot involving the other in the setting of systems, by advising the other pilot of system status,. More specific guidance follows.

b) Flight Guidance – Common Procedures [The contents of this section are largely dependent on the equipment installed on your aircraft or not at all if your aircraft is not appropriately equipped.] As much as practical the Flight Guidance Display (Flight Director) for the PNF should be set the same as that of the PF. When both Flight Guidance Displays are set the same and a significant difference (beyond the normal limits of display accuracy) is observed, both displays shall be compared to the primary control and navigation displays. If it can be readily determined which display is in error then, subject to the AFM and other sections of the SOPs, flight may be continued using the remaining display. If both Flight Guidance Displays are found to be in error then they should be removed from view (selected to standby).

c) Flight Guidance – Autoflight [The contents of this section are largely dependent on the equipment installed on your aircraft or not at all if your aircraft is not appropriately equipped.] Unless workload dictates otherwise, whenever in autoflight the PF should make all Flight Guidance selections and appropriately advise the PNF. Further direction specific to other phases of flight is available elsewhere in the SOPs.

d) Flight Guidance – Manual Flight [The contents of this section are largely dependent on the equipment installed on your aircraft or not at all if your aircraft is not appropriately equipped.] Unless workload dictates otherwise, whenever in manual flight the PF

should request the PNF to make all Flight Guidance selections. The PNF shall advise the PF of the of the completion of requested Flight Guidance selections. Further direction specific to other phases of flight is available elsewhere in the SOPs.

e) Navigation Displays [The contents of this section are largely dependent on the equipment installed on your aircraft.] There is a good deal of variation amongst pilots in how each one best assimilates information. Therefore, it may not be advantageous to be overly specific in directing how a pilot is to set up the navigation displays at a particular station. However, some commonality is useful in that crew members can more readily detect inappropriate selections in there own and other displays if there is some common basic coordination requirement. The following is provided as guidance; further direction is provided elsewhere in the SOPs:

i) both heading reminders (heading bugs) should be set to the same heading;

ii) both course displays (track bars) should be set to the same navigation and track information unless one is required to display other information (such as crossing fix position);

iii) both course displays should be set to the same NAVAID unless otherwise required;

iv) at least one bearing pointer should be set to display navigation information for the procedure being flown (if applicable);

v) additional bearing pointers may be set to the individual pilot preference;

vi) the mode of display (arc, map, HSI, etc.) for each pilot may be set at that individual's preference provided that sufficient information is displayed for the procedure being flown.

1.19. Traffic Alert and Airborne Collision Avoidance Systems

[Under current Canadian Regulations ACAS and TCAS are not required to be installed. Some operators have installed ACAS/TCAS to meet the requirements of the United States Federal Aviation Administration (FAA). If your aircraft are equipped with ACAS/TCAS, crew coordination is likely required in the use the equipment. Therefore, it would be useful to detail crew procedures in this section.]

[Insert your organization's procedures for the use of ACAS/TCAS.]

Chapter 2. Pre-Flight

2.1. Introduction

a) This chapter of the SOPs, "Pre-Flight", provides guidance for the period up to but not including the start of the first engine with the intent of going flying. It does include starting of an engine to reposition the aircraft prior to the final taxi out for departure.

b) For multiple flights, portions of this chapter and the chapter pertaining to "After Flight" shall apply.

2.2. Reporting for Duty

[If your aircraft does not use a FE delete any reference or change to SO if applicable. The following times are shown as an example only. They are not meant to indicate a requirement.]

a) The following are the reporting for duty requirements for the initial departure of the day from bases that have [insert company name] support.

i) Captain The Captain shall report for duty no less than ___ minutes prior to departure.

ii) First Officer The FO shall report for duty no less than ___ minutes prior to departure.

iii) Flight Engineer The FE shall report for duty no less than ___ minutes prior to departure.

iv) Flight attendant The FA shall report for duty no less than ___ minutes prior to departure.

v) Late Arrivals Should the FE not have reported for duty by the time that the Captain reports for duty the Captain shall contact dispatch and, if appropriate, shall attempt to contact the FE. Should the FO not report for duty by ___ minutes before departure the Captain shall contact dispatch and, if appropriate, shall attempt to contact the FO. Should the Captain not have reported for duty by the time that the FO reports for duty, the FO shall contact dispatch and, if appropriate, shall attempt to contact the Captain

b) For departures from bases that do not have company support, the requirements to report for duty shall be specified by the Captain.

2.3. Planning

a) Flight Plans Unless otherwise arranged, the Captain shall prepare any operational flight plans, and ATC flight plans/itineraries. The Captain shall ensure that they are properly completed and filed with the applicable agencies and that the FO has been apprised of the contents of any flight plans and itineraries.

b) Performance Computations Unless otherwise arranged, the FO [or FE if applicable] shall complete all required performance computations prior to each flight. The Captain shall review the computations and ensure that the required information is appropriately displayed.

2.4. Weight and Balance Control

Unless otherwise arranged, the FO [or FE if applicable] shall complete all required Weight and Balance Documents prior to each flight. The Captain shall review the documents and ensure that the required information is properly completed.

2.5. Crew Briefing

[Additional requirements for crew briefings may be found in the CARs and related standards.]

Prior to each flight each crewmember shall brief the remaining crewmembers of any information about the flight that is relevant to their duties. Such briefing should not include a repeat of information that is available from other sources or has been previously provided (such as these SOPs), but should include information about procedures that are seldom used. As a minimum the following information should be provided to all crew members in sufficient detail to facilitate performance of their duties:

a) weather for departure, en route, destination, and (if applicable) alternate destination;

b) aircraft fuel load and configuration;

c) payload;

d) flight time, route to be flown, and any work to be carried out;

e) duties in addition to those specified in these SOPs and other directives.

2.6. Pre-Flight Inspections and Checks

[In this section insert any company policy that deals with crew coordination as it pertains to any flight crew maintenance activities. Also, this section is to include expanded checklists. The following checklist is a guide only and cannot apply to all aircraft. The checklist particular to the aircraft must be inserted here]

a) Inspections [Insert your company and aircraft type inspection and maintenance requirements an example follows.] When operating at locations where company maintenance is not available, flight crews are authorized and required to carry out inspections as detailed in the following paragraphs. Note that routine replenishment of fluids is approved as a flight crew function at any time.

b) Pre-external Check The Pre-external Check shall be completed before starting the External Check. It shall be completed in its entirety whenever the aircraft has been completely de-powered. The expanded Pre-external Checklist follows.

PRE-EXTERNAL CHECK

Chocks	**a/r**
Parking Brakes	**ON**
Batteries	**ON**
External Power	**a/r**

External power is to be used if available. Ensure bus voltage with external power is a minimum of 26 VDC.

Flight Controls	**Locked**
(24) Safety Equipment	**Checked**

Check: crash axe, flashlights, flight crew oxygen masks and quantity.

Batteries	**a/r**

External Check The External Check shall be completed in its entirety at least once every 24 hrs. and whenever the crew deems that it is appropriate to do so. For brief "station stops" between flights, items prefixed with (24) need not be completed. The External Check is commenced at [insert the point that the check begins for your type of aircraft] and continues in a clockwise direction (when looking down on the aircraft) until complete. Unless otherwise arranged, the External check shall be completed by the FE. The expanded External Checklist follows.

NORMAL PROCEDURES

EXTERNAL CHECK

Left & Right Fuselage

Fuel Caps	**Secure**
Left Fuselage	**Checked**
Left Main Landing Gear Pin	***a/r***

Left & Right Engine Nacelle and Wing

(24) No. 1&2 Engine Oil	**Checked**

Minimum engine oil for dispatch is ___ US gal. At least an additional __ US gal. is required for each planned hour of flight above ___ hrs. to a maximum of ___ US gal.

CAUTION
Ensure oil tank cover is secure. Unsecured oil tank cover will cause complete loss of oil supply.

Wing trailing edge	**Checked**
Wing tip & position lights	**Checked**

Internal Check The Internal Check shall be completed in its entirety at least once every 24 hrs. and whenever the crew deems that it is appropriate to do so. For brief "station stops" between flights, items prefixed with (24) need not be completed. The Internal Check applies to the interior of the aircraft but does not include the flight deck. Unless otherwise arranged, the Internal check shall be completed by the FE/FA. Verify that the passenger seats are securely fastened to the floor, seats do not block emergency exits, seat back locks in the upright position and seatbelt is in good working condition. The expanded Internal Checklist follows.

INTERNAL CHECK

Passenger Seats	**Checked**
(24) Cabin Oxygen Supply	**Min pres** ____ psi
(24) First Aid Kits	**Checked**

The 3 First Aid Kits are located at the forward right emergency bulkhead, the aft cabin bulkhead and the aft wall of the galley.

(24) Fire Extinguishers **Checked**

The ___ Fire Extinguishers (in addition to the one in the flight compartment) are located on the back of the flight compartment bulkhead, at the galley, in the baggage compartment, and the aft cabin bulkhead.

Cabin Windows **Checked**

Flight Deck Geographic Checks The Flight Deck Geographic Checks shall be completed in their entirety at least once every 24 hrs and whenever the crew deems so. For brief "station stops" between flights, items prefixed with (24) need not be completed. The respective checks shall be completed by the flight crew member whose duty station is at that seat. The expanded Flight Deck Geographic Checklists follow.

FLIGHT DECK GEOGRAPHIC CHECK – PILOT

Batteries **ON**
Bus Tie **Normal**
Engine Overspeed **Checked**

Engine overspeed check is completed by selecting the overspeed test switch to TEST and observing the ENGINE OVERSPEED WARNING lights illuminate.

Power Levers **Check full travel**

The flight control lock limits power lever travel. Therefore, it must be unlocked to check full power lever travel.

NOTE
Unlocking the controls with a tailwind may cause the control columns to move suddenly and violently

Engine Fire Warning **Test**

To prevent unintended emergency response by the crew, advise other crew members prior to carrying out the engine fire warning test

Ignition **Normal**

FMS/RNAV/GPS/INS **Initialize and program**

[See the section that deals with recommended practises for initializing and programming FMS and RNAV systems]

FLIGHT DECK GEOGRAPHIC CHECK – CO-PILOT

[The Flight Deck Geographic Check for the Co-pilot would follow the same format as for the pilot.]

FLIGHT DECK GEOGRAPHIC CHECK FLIGHT ENGINEER

[The Flight Deck Geographic Check for the FE would follow the same format as for the pilot.]

2.7. Aircraft Icing Operations – Before Engine Start

[This section is not intended to replace any of your company requirements or the requirements specified in the CARs for Aircraft Icing Operations. However, for your operation, detail the role that the crew has in dealing with ground icing before engine start.]

[Insert crew coordination that is required under your company's and the CARs requirements].

2.8. FMS/GPS/INS/RNAV Initialization and Programming

[If the aircraft type that these SOPs refers to is not equipped with an RNAV system do not include this section.]

[The requirements for use of RNAV (which includes the use of FMS, GPS, and INS) is specified in areas of the CARs Standards other than those that pertain to the SOPs. However, the safe and effective use of Area Navigation Systems invariably requires crew coordination. Therefore, RNAV will be discussed in several areas of these SOPs.]

[If it is necessary to carry out FMS/GPS/INS/RNAV initialization and programming after engine start include the relevant information in the "Normal Flight Procedures Departure" chapter instead of this chapter.]

[Depending on the type of RNAV equipment and company procedures, the depth of guidance presented in this section will vary considerably. Some recommended practises are contained in the documentation that pertains to the specific equipment. Additional general guidance is available from your regional office. The following is a very general indication of some of the types of crew coordination that may be appropriate with a dual linked RNAV system.]

a) RNAV Designation The Number 1 RNAV is located adjacent to the pilot's seat. The Number 2 RNAV is located adjacent to the co-pilot's seat. [Or, insert the relevant designations for your aircraft.]

b) Initialization The pilot should initialize the No. 1 RNAV and the Co-pilot should initialize the No. 2 RNAV. During initialization it is important to enter the coordinates of the start position with as much accuracy as possible. Each pilot shall insert the start coordinates individually and silently. The track and distance to the first waypoint will later be used to verify correct initialization. This procedure is designed to reduce the risk of both pilots agreeing on an incorrect initial position and inserting it in the navigation system. In the event that only one RNAV system is operational, one pilot will obtain start coordinates from the applicable document and then type them into the RNAV. Prior to accepting the data, the other pilot will look at the coordinates displayed on the CDU then compare them to the document. Use of this reverse path checking technique should reduce the risk of incorrect data entry.

c) Route Programming The reverse path checking procedure that is described in this paragraph is similar to that used for single RNAV initialization. It is also intended to reduce the risk of incorrect typing of data into an RNAV system. One pilot is to obtain route/waypoint information from the appropriate document then silently enter it into either one of the RNAV systems. When complete, the other pilot will read the route/waypoint data from the CDU of the recently programmed system and check it against the applicable document. If the second pilot finds an error, that pilot will now insert correct data. The other pilot will check it by looking at the CDU and comparing it to the document. Once the correction is confirmed the second pilot will continue the verification process to completion. For use of Waypoints that are extracted from a database that is integral to the RNAV system, the individual waypoint component data shall be verified for accuracy against an external document. The data checking is required any time when it can not be positively determined that the waypoint has been verified since the last database update. Unfortunately, database information has on occasion been reported to have errors.

d) Pre-programmed Routes Pre-programmed routes need be checked by only one pilot unless an error is found. Errors are to be corrected as described in the preceding paragraph. Pre-programmed routes need only be checked if the database has been updated.

e) Data transfer To further reduce typing errors, the flight plan information entered or selected on the first RNAV should be electronically transferred to the other unit using the data link. Information should only be typed into the second system in the event of unserviceability.

f) RNAV System Comparison The bearing and distance to the first waypoint as displayed by the two RNAV systems is to be compared. They should be the same. If a

discrepancy is found it must be corrected. If one of the systems can be determined to be faulty it must not be used. If the discrepancy can not be accounted for neither system is to be used.

2.9. Auxiliary Power Unit

[If your aircraft is not equipped with an auxiliary power unit delete this section.]

[If your aircraft auxiliary power unit is approved for use in flight, or if it can be used in flight but is not authorized for use in flight, insert the applicable information here and in the other chapters of the SOPs.]

[If the AFM for your aircraft specifies that operation of the auxiliary power unit requires human presence include that requirement in this section.]

[There are essentially two options for organizing checks for APU operation. The first is to include the required actions for start, operation and shutdown only in one section of the SOPs Checklists and then refer to that section in other areas. For example, the start of the APU as part of an After Landing Check could refer to the APU start check that is found in the Pre-flight chapter. The second option is to repeat the relevant portion of the APU checks in the respective checklists parts. You should choose whichever option best suits your operation. In these generic SOPs we have chosen option one and have located the checks in only one place and then referred to them throughout the SOPs and checklists.]

Whenever the Auxiliary Power Unit is used the following checks shall be used for start, operation and shutdown. Although the APU checks are designated to be completed by the PNF, if two crewmembers are available, it is recommended that the checks be carried out as "Challenge and Response" procedures.

APU START CHECK (PNF)

Batteries	**ON**
External Power	**a/r**
A/COL Lights	**RED**

To warn personnel that the APU is operating, the anti-collision lights must be at red or white whenever the APU is running.

APU MSTR	**Press On**

It will be necessary to wait approximately ___ seconds for the inlet door to open. Wait until the "INLET DR" annunciator extinguishes before starting the APU.

APU START Switchlight	**Press**

The APU start switchlight must be pressed for at least one second. An inadvertent selection lockout feature will prevent APU start if the switch is pressed for less than 0.5 second.

RUN annunciator	**RUN (within ___ sec)**

APU AFTER START CHECK (PNF)

APU GEN	**Press GEN**

The "GEN" annunciation will illuminate if the generator is serviceable. If it does not illuminate operation of the APU for bleed air is permitted.

APU BLD AIR	**Press BLD AIR (after ___ sec)**

It is necessary to wait at least ___ sec. after the APU "RUN" annunciator illuminates to ensure stabilization of APU intake air before selecting the APU bleed air on.

APU SHUTDOWN CHECK (PNF)

Batteries	**ON**
External Power	**a/r**
APU GEN	**Off**
APU BLD AIR	**Off**
APU MSTR or OVRSPD TST	**Press**

The APU may be shutdown using either the master or the overspeed test. The overspeed test should be used at least once every ___ hrs. of APU operation. When shutdown is done using the overspeed test it will be necessary to select the APU MSTR switchlight to off to close the inlet door.

2.10. Apron Safety and Embarking/Disembarking Passengers

[Although some of the requirements are dealt with in the Company Operations Manual, crew coordination is likely required, and therefore some information would be useful in the SOPs. The following deals only with crew coordination responsibilities. It may be advantageous to include specific details, such as:
- safety procedures;
- securing of propellers.
For additional information refer to the CARs and related standards or contact your regional office.]

a) Unless otherwise arranged, the Captain shall escort passengers on the apron to and from the aircraft.

b) The No. 1 engine propeller is to be tethered whenever embarking or disembarking passengers and wind conditions are such that it may rotate.

2.11. Fuelling With Passengers Onboard, Embarking or Disembarking

[Although some of the requirements are with in the Company Operations Manual, crew coordination is likely required, and therefore some information would be useful in the SOPs. The following deals only with crew coordination responsibilities. It may be advantageous to include specific details, such as:
- safety procedures;
- a specific statement that aircraft main engines are not allowed to be running (unless otherwise authorized in accordance with the CARs);
- use of the APU.
For additional information refer to the CARs and related standards or contact your regional office.]

Unless otherwise arranged, the FO shall supervise fuelling and remain near the aircraft main exit to immediately communicate with and assist the evacuation of passengers in an emergency. If one of the pilots is to actually carry out fuelling, the other pilot shall supervise the refuelling and provide for passenger safety.

2.12. Passengers – Seating Location Restrictions and Briefing

[Although some of the requirements are to be dealt with in the Company Operations Manual, crew coordination is likely required, and therefore some information would be useful in the SOPs. The following only deals with crew coordination responsibilities for passenger seating location and briefing. We recommend the inclusion of the following specific details:
- content of passenger briefings; and
- guidance for crew members dealing with passengers seated at emergency exits.
For additional information refer to the CARs and related standards or contact your regional office.]

a) A. Passenger Seating Location Restrictions Unless otherwise arranged, the Captain shall ensure that seats located at emergency exits are not occupied by

passengers whose presence in those seats could adversely affect the safety of passengers or crew members during an emergency evacuation.

b) B. Passenger Briefings Unless otherwise arranged, before flight passenger briefings shall be carried out by the Captain.

2.13. Emergency Procedures Review

Prior to the first flight of the day, or whenever one or more of the flight crew members has been replaced, the flight crew should review the memory portions of a selection of the emergency procedures.

2.14. Before Start Check

[The following procedure caters to the Before Start Check being initiated by the person who will conduct or direct the start. If your company procedure is for another person to initiate the check (such as the Captain) or for the FE to start the engine(s), modify this section appropriately.]

The person who will conduct or direct the start calls for the Before Start Check. The expanded Before Start Checklist follows.

BEFORE START CHECK (Challenge and Response)

Pre-flight checks (All) **Complete**

All flight crew members are to respond that the checks that they are responsible for are complete.

Ignition **NORMAL**

The ignition must be set to normal for engine start. Selecting the ignition to off will prevent a start. Selecting ignition to ON will prevent the start sequencer from turning off the ignition at the completion of the start.

EMERGENCY BRAKES **PARK**
Engines **Clear**
Before Start Check **Complete**

2.15. Air Traffic Control Clearance

If an IFR Air Traffic Control clearance is required it should be requested prior to engine start. Should there be a delay in obtaining the IFR clearance, consideration should be given to delay of the engine start. The passengers and flight attendant(s) should be informed accordingly.

2.16. Repositioning using Aircraft Engines

[Use the applicable text for either aeroplane or helicopter.]

a) [Aeroplanes] For repositioning of an aeroplane using one or more of its engines, the checks in the following paragraphs shall be carried out. Even though it may not be necessary to start all of the engines to taxi the aircraft, all of the checks shall be carried out. It is recognized that not all of the items will need action. However, to reduce the risk of missing an important item, all of the checks listed are to be completed.

i) Before Start Check;

ii) Engine Start Check;

iii) Before Taxi Check;

iv) After Landing Check;

v) Shutdown Check.

b) [Helicopter] For repositioning where the helicopter will not lift off, the checks in the following paragraphs shall be carried out. Even though it may not be necessary to start all of the power plants to taxi the aircraft, all of the checks shall be carried out. It is recognized that not all of the items will need action. However, to reduce the risk of missing an important item, all of the checks listed are to be completed.

i) Before Start Check;

ii) Engine Start Check;

iii) Before Taxi Check;

iv) After Landing Check;

v) Shutdown Check.

c) [Helicopter] For repositioning where the helicopter will lift off, the checks in the following paragraphs shall be carried out. It is recognized that not all of the items will need action. However, to reduce the risk of missing an important item, all of the checks listed are to be completed.

i) Before Start Check;

ii) Engine Start Check;

iii) Before Taxi Check;

iv) Before Take-off check;

v) After Landing Check;

vi) Shutdown Check.

Annex A to Chapter 2
Pre-flight,
Abbreviated checklists

[The following is an example only. Insert procedures that are used in your operation that are applicable to your aircraft as per the Aircraft Flight Manual.]

Pre-flight Checklists

The abbreviated form of the Pre-flight checklists follows.

PRE-EXTERNAL CHECK

Chocks	**a/r**
Parking Brakes	**ON**
Batteries	**ON**
External Power	**a/r**
Flight Controls	**Locked**
Safety Equipment	**Checked**
Batteries	**a/r**

EXTERNAL CHECK

Left Right Fuselage

Fuel Caps	**Secure**
Left Fuselage	**Checked**
Left Main Landing Gear Pin	**a/r**

Left Right Engine Nacelle and Wing

No. 1&2 Engine Oil	**Checked**

CAUTION

Ensure oil tank cover is secure. Unsecured oil tank cover will cause complete loss of oil supply.

Wing trailing edge	**Checked**
Wing tip & position lights	**Checked**

INTERNAL CHECK

Passenger Seats	**Checked**
Cabin Oxygen Supply	**Min pres ____ psi**
First Aid Kits	**Checked**
Fire Extinguishers	**Checked**
Cabin Windows	**Checked**

FLIGHT DECK GEOGRAPHIC CHECK – CO-PILOT

[The Flight Deck Geographic Check for the Co-pilot would follow the same format as for the pilot.]

FLIGHT DECK GEOGRAPHIC CHECK – FLIGHT ENGINEER

[The Flight Deck Geographic Check for the FE would follow the same format as for the pilot.]

APU START CHECK (PNF)

Batteries	**ON**
External Power	**a/r**
A/COL Lights	**RED**
APU MSTR	**Press On**
APU START Switchlight	**Press**
RUN annunciator	**RUN (within ___ sec)**

APU AFTER START CHECK (PNF)

APU GEN	**Press GEN**
APU BLD AIR	**Press BLD AIR (after ___ sec)**

APU SHUTDOWN CHECK (PNF)

Batteries	**ON**

External Power	**a/r**
APU GEN	**Off**
APU BLD AIR	**Off**
APU MSTR or OVRSPD TST	**Press**

BEFORE START CHECK (Challenge and Response)

Pre-flight checks	(**All**) **Complete**
Ignition	**NORMAL**
EMERGENCY BRAKES	**PARK**
Engines	**Clear**
Before Start Check	**Complete**

Chapter 3. Normal Flight Procedures - Departure

3.1. Introduction

This chapter of the SOPs, "Departure", provides guidance for normal operations from the start of a power plant through the departure and climb portion of the flight, up to but not including level-off.

3.2. Engine Start

[The following example is based on the start of a two engine aircraft. If your aircraft is equipped with more or less than two engines adjust the procedure accordingly.]

The engine start is done as a memorized series of coordinated actions by both the PF and PNF. Although an "Engine Start Check" is published, it is not carried out in the same manner as other checks, but as a procedure. The engines are normally started by the pilot, with the co-pilot monitoring the start and critical timings. Therefore for the purpose of this procedure the pilot is the PF and the co-pilot the PNF. Should it be necessary for only one pilot to carry out an engine start, that pilot shall carry out both PF and PNF duties. If both engines are to be started, normally the number 2 engine is started first. The abbreviated "Engine Start Check" is found in the checklist. The coordinated crew procedure follows.

Table 3-1 Engine Start Procedure and Crew Coordination

- **ENGINE START CHECK (PF/PNF)**

PF	PNF
Engines **Clear** Check engine clear on PF side and confirm clear with ground personnel if available. Call "Number x engine clear."	Engines **Clear** Check engine clear on PNF side. Call "Number x engine clear."
START SELECT Switch **Select #2** Arm number 2 engine start. – Select START SELECT Switch to #2 and observe STARTER switchlight illuminates.	

NORMAL PROCEDURES

STARTER Switchlight **Press** Initiate number 2 engine start. – Call "Starting Number 2." – Press STARTER switchlight.	Clock **Start timing** Start timing of number 2 starter engage time and monitor for time limits.
Condition Lever (___-___% N_H) **START/FEATHER** Initiate fuel flow at ___% to ___% N_H. – Call "Fuel On." – Select Number 2 condition lever to START/FEATHER.	
Fuel Flow **Confirm** Confirm fuel flow. – Confirm positive fuel flow - no minimum rate is established. – If fuel flow confirmed call "Fuel Flow."	
ITT **Indication within 10 seconds** Confirm ITT rise within 10 seconds. – If ITT rise confirmed call "ITT." – Monitor ITT limits. – If no ITT rise within 10 seconds, or if ITT/N_H stabilizes at abnormally low values, call "Failed Start" and initiate applicable procedure.	Monitor ITT time limits. – If ITT exceeds ___°C note time max allowable between ___°C and ___°C is 5 seconds. – If ITT exceeds time limits call "Hot Start."
Oil Pressure **Indication** Confirm oil pressure. – If oil pressure rise confirmed call "Oil Pressure." **NOTE** Minimum oil pressure by completion of engine spool-up during start is ___ PSI. If ___ PSI is not reached by end of spool-up engine must be shut down.	
Hydraulic Pressure **Indication** Confirm Hydraulic Pressure. – If hydraulic pressure confirmed call "Hydraulic Pressure."	
Engine Start **Complete** – At completion of starting of the number of engines that it is intended to start call "Engine Start Complete."	– Acknowledge by stating "Check."

3.3. Before Taxi

[The following example caters to an aircraft that can only be taxied from the pilot's (left) seat. If your aircraft can be taxied from either the pilot's or co-pilot's seat, amend the following appropriately.]

[The following example caters to an operation that has a flight attendant. If your operation does not use a Flight Attendant, some of the FA's duties will need to be carried out by the pilots.]

Prior to moving the aircraft under its own power the "Before Taxi Check" shall be completed. As the aircraft is normally taxied only from the pilot's seat, for the "Before Taxi Check," the pilot is considered the PF and the Co-pilot the PNF. The expanded "Before Taxi Check" follows.

BEFORE TAXI CHECK (Challenge and Response)

EXT POWER **OFF**

The External Power switch must be selected off to prevent arcing at the ground power receptacle.

External Power **Disconnected**
Chocks **Removed**
Ground Services **Clear**

Ensure all ground power equipment, towing tractors, and any other ground support equipment is clear of the aircraft prior to taxi.

Standby to Taxi (FA) **Cabin secure**

It is necessary to establish contact with the Flight Attendant (FA) to ensure that passengers are seated prior to taxiing the aircraft. Normally the public address system is chimed once to attract the FA's attention prior to this call. The FA should then respond to the challenge of "Standby to Taxi" with the statement "Cabin Secure."

Before Taxi Check **Complete**

3.4. Navigation Aids – Set-up for Departure

If practical, navigation equipment should be set as required before commencing taxi. Navigation equipment should be set up as follows:

a) For local flights, set the active mode of the navigation equipment for the procedure that is expected to be flown after take-off. Secondary modes should be set to the next most likely procedure.

b) For other than local flights departing in weather that may permit a return to the departure aerodrome, set the active mode of equipment for en route flight. Secondary modes should be set to facilitate recovery at the departure point.

c) For flights that are departing in weather that is unlikely to permit a return to the departure aerodrome, set the active mode of equipment for en route flight. Secondary modes should be set to facilitate recovery at the take-off alternate.

3.5. Taxi Check and Procedures

[The following example caters to an aircraft that can only be taxied from the pilot's (left) seat. If your aircraft can be taxied from either the pilot's or co-pilot's seat, amend the following appropriately.]

[The following example caters to an aircraft that does not have good visibility to the opposite side of the pilot taxiing the aircraft and therefore requires that both pilot seats must be occupied. If your aircraft can be taxied safely with only one of the pilot seats occupied amend this section accordingly.]

a) General The aircraft is normally taxied from the left seat only, using powered nose wheel steering. During taxi, at least one VHF radio shall be on, tuned to an appropriate frequency that would permit exchange of traffic information, and monitored by the pilots. Both pilot seats should be occupied whenever the aircraft is taxied. The PNF shall advise the PF whenever there is a hazard of collision. Should it be necessary to have the co-pilot seat occupied by a person other than a pilot qualified on type, that person shall be fully briefed on duties and procedures. If necessary a marshaller is to assist in taxiing in the vicinity of obstructions.

CAUTION

Due to inadequate visibility on the opposite side of each of the pilot seats, this aircraft should not be taxied unless both pilot seats are occupied and the personnel are in direct communication with each other.

b) Wheel Brake Checks As soon as possible after beginning to taxi, the aircraft wheel brakes should be checked for proper operation. [If appropriate for your aircraft insert the procedure for the PNF checking brakes. As many aircraft have brake pedals that are mechanically linked, there may not be a requirement for the PNF to check brakes. If there are limitations or hazards that apply to both pilots using brakes at the same time insert the relevant information here.]

[The speed at which the aircraft should be taxied, other than in congested areas, is very much particular to the type of aircraft. Aircraft without ground steering and reverse thrust that are equipped

with drum brakes may have to be taxied fast enough to make aerodynamic controls effective otherwise the required use of brakes may cause sufficient heating and fading that a loss of braking may result at a critical time. Other aircraft with high-loading high-pressure tires, possibly should taxi slowly to prevent tire heating and reduced tire life. In deciding on the taxi procedure, caution should be taken to ensure that procedures desirable for one aircraft type not be inappropriately applied to another type.]

c) Taxi Speed Taxi speed shall be appropriate to the conditions. When taxiing in congested areas the aircraft shall be taxied at no more than walking speed. For taxiing in open areas taxi speed may be increased, but shall not be such that harsh braking or turning at high speed is required. For taxiing on surfaces contaminated by slush, snow, or standing water, speed shall be adjusted (increased or decreased) to minimize impingement of spray/snow on the aircraft. For taxiing on gravel, loose surfaces, or unprepared surfaces, speed shall be adjusted (increased or decreased) to minimize FOD to engine intakes and propellers. For turns of more than a few degrees, the aircraft shall not be taxied at more than walking speed. Reduced speed in turns is required (particularly in cold weather) to reduce lateral strain of the aircraft and minimize the possibility of a tire losing air through the bead/wheel contact area [or if applicable, hazard of tube stem failure].

[Insert the taxi procedure/technique that is applicable to your type of aircraft. The following is a very general guide. It caters to an aircraft that has powered nose wheel steering.]

d) Taxi Procedure Taxi procedure and speed are to be managed to operate the aircraft safely and smoothly. Only the minimum thrust/power above idle that is required should be used to accelerate to taxi speed from a stop. All turns, accelerations, and decelerations shall be carried out smoothly. Applications of thrust (forward and reverse) and braking shall be done smoothly. Applications of power shall be done so as to minimize the FOD hazard. At taxi speeds the aircraft is to be steered using the tiller and/or rudder pedals to control the powered nose wheel steering. Brakes should not be used for steering. Acceleration and deceleration during taxiing should be planned so as to minimize wear on brakes. When applying brakes to stop the aircraft, brake pressure should gradually be reduced as the aircraft slows to prevent it from lurching to a stop.

e) Nose Wheel Steering Inoperative In the event that nose wheel steering is unserviceable the AFM Supplement for Nose Wheel Steering Inoperative shall apply.

[Insert applicable information in the following sub-section only if your aircraft is permitted to taxi without all engines operating.]

f) Taxiing Without All Engines Operating The [aircraft type] aircraft is not normally taxied with the intention of flight unless all engines are operating. However, it may be appropriate to reposition the aircraft without starting all engines. The procedure is

more likely to apply for taxiing after landing. Therefore, the details are found in the Normal Flight Procedures Arrival chapter

[Insert applicable information in the following sub-section only if your aircraft is permitted to taxi in reverse.]

g) Reverse Taxiing Taxiing in reverse should be kept to a minimum. Taxiing in reverse with asymmetric power is prohibited. Brakes shall not be used during reverse taxi. Rather the aircraft shall be stopped or accelerated into forward taxi using forward thrust only.

CAUTION

Application of brakes during reverse taxiing may cause the aircraft to tip onto its tail, resulting in substantial damage.

In deciding to taxi in reverse, the following negative aspects should be considered:

i) poor visibility behind the aircraft;
ii) increased FOD hazard to engines/propellers;
iii) high engine temperatures and reduced engine cooling.

h) Taxiing Safety The safety of the aircraft during taxi shall not be jeopardized by other duties. Aircraft checks may be done during taxi only when it is safe to do so. If necessary, the "Taxi Check, Before Take-off Check, and After Landing Check" should be delayed until it is safe to carry them out. Checks shall not be done while taxiing in a congested area. Particular care must be taken when completing checks while taxiing on any runway or helicopter landing area regardless of whether it is active or not. Prior to taxiing on to or in close proximity to any runway or helicopter landing area, each pilot shall visually confirm and advise the other pilot that no hazard will be created by arriving or departing aircraft. To the extent that other duties permit, the PNF shall maintain a lookout and advise the PF of any hazard at any time that the aircraft is taxied. The PNF may complete duties that relate to aircraft, load, company, or like documents only when safety is not jeopardized. In particular, the PNF shall not deal with documents while the aircraft is taxiing on or near any runway or helicopter landing area, nor in a congested area. Radio communication is not permitted on other than the relevant aeronautical frequency whenever the aircraft is taxiing on or near any runway or helicopter landing area or in a congested area.

i) Taxi Check Once clear of any congested areas the PF may request that the taxi check be carried out. The expanded taxi check follows.

TAXI CHECK (Challenge and Response)

Brakes (PF)**Checked**
The brakes should be checked as soon as practical after the aircraft begins to taxi. This challenge is a confirmation that the brakes have been checked.

Flight Instruments (PF/PNF) **Checked**

The Flight Instruments shall be checked for appropriate operation during turns of at least [insert the number of degrees to be turned based on the AFM or company policy] degrees.
[The instrument checks described in the instrument procedures manual are a good starting point for specifying the company policy on instrument checks. However, the profusion of avionics in aircraft today may make the traditional "needle left, ball right" checks inadequate or even inappropriate. Also depending on your company's operating environment and particular avionics suite installed on the aircraft it may or may not be appropriate to verbalize each item of the instrument check procedure. Therefore, you should specify the relevant procedure for your type of aircraft and operation.]

Altimeters (All) **XXXX inches Set**

APU (PNF) **Shutdown**

Carry out the APU Shutdown Check.

Take-off Briefing (PF) **Complete**
Taxi Check (PNF) **Complete**

3.6. Aircraft Icing Operations – Taxi

[This section is not intended to replace any of your company requirements or the requirements specified in the CARs for Aircraft Icing Operations. However, if in your operation the crew has a role in dealing with icing after taxiing has begun, detail those actions here.]

a) Regardless of any previous actions taken to inspect for or remove frost, ice, or snow, if the crew suspects that such contamination is present, the following inspections shall be made immediately prior to take-off:

i) The PF and PNF shall each visually inspect the representative surface that is visible from their respective pilot seats.

ii)

iii) If the Captain deems it appropriate, the PNF shall carry out an external inspection of the critical surfaces.

b) Should any frost, ice, or snow be found to be adhering to critical surfaces, the aircraft shall not take-off. Rather arrangements shall be made to de-ice the aircraft.

[It may be useful for your operation to discuss techniques for dealing with snow and/or slush on manoeuvring areas. Consider such things as taxi speed, use of brakes, use of zero thrust and reverse thrust. The following is an example for a fictitious turboprop aircraft. Insert the procedures for your type of aircraft and your operation. In particular, the procedures must be in concert with the AFM.]

c) To the extent practical avoid taxiing through slush or loose snow. Under no circumstances should the aircraft be taxied through packed snow drifts that are deeper than the distance from the bottom of the wheel hub to ground. For dealing with slush or loose snow during taxi the following practises are recommended:

i) Speed must be managed to minimize slush or snow impinging on flaps, landing gear doors, propellers, intakes, and brakes. Too high a taxi speed may result in contaminants spraying on the flaps. Too slow a taxi speed may cause snow to be pulled into the propeller.

ii) Speed must be sufficient to prevent the aircraft from bogging down in snow.

iii) Avoid use of reverse thrust as it may cause contaminants to become airborne and impinge on the aircraft. To reduce speed use zero thrust and judicious braking.

iv) When the aircraft is stopped set the engines and propellers to minimize blowing of snow and slush on to the aircraft.

3.7. Run-up, Functional Checks, Systems Checks

[Some types of aircraft require before take-off a run-up, functional checks, and/or systems checks. If these checks are not done as part of the Before Taxi Check or if the aircraft must normally be repositioned due to engine or propeller blast, specify the details of those checks here. Ensure that any safety requirements, such as clearance from buildings or other aircraft are specified.]

[The example below is for a fictitious aircraft. Insert the relevant procedures for your operation.]

The expanded Run-up, Functional Checks, Systems Checks follow.

RUN-UP CHECK (Challenge and Response)

EMERGENCY BRAKES (PF) **PARK**

The Emergency Brakes shall be set to Park prior to the Run-up procedure and checks.

Magnetos (PF) **Checked**

Each engine magneto switch shall be checked at Left, Right, and Off; and the Master Magneto switch shall be checked at ON and OFF.

Engine RPM (PF) **Set to ____ RPM**
Propellers **Exercised**

Exercise the propeller levers to minimum and maximum three times. The RPM shall drop at least 500 RPM. Less that 500 RPM drop indicates a faulty CSU. Rectification is required before flight.

Run-up Check **Complete**

3.8. Take-off Briefing

[To the extent practical the Take-off briefing should be concise. It is not necessary to repeat standard items and procedures. For example, if it is standard to always abort the take-off in the event of a malfunction before V_1 (and it should be) there is no need to repeat this fact. The items that should be included in the Take-off briefing are those that change routinely (ie., speeds that change with weight) or items that are normally standard but are different for this particular take-off (ie, a turn before 400 ft. above the departure end due to obstacles). Similarly, procedures that are published in Flight Information Publications such as the CAP may be referred to by name only, ie, "The departure procedure is SOMEWHERE SIX." Depending on the circumstances and the type of aircraft, the Take-off briefing may be as simple as "This will be a Standard Take-off" to one that is quite complex. In setting a company policy for briefings, consider that short, simple briefings are more likely to be understood and remembered than ones that are long and complex but very complete.]

[The example below is for a fictitious aircraft. Insert the relevant procedures for your operation.]

a) Prior to each take-off the PF shall give a Take-off briefing. Note that for a touch and go landing the Take-off briefing is given as part of the Landing Briefing. Procedures that are standard as published in these SOPs need not be repeated in detail. Should it be necessary to amend the normal procedure as a result of the application of a supplement subsequent to a malfunction, that requirement shall be fully briefed. The Take-off Briefing shall include the following elements:

i) Take-off weight;
ii) Flap setting;
iii) If other than standard: Take-off power and Maximum Take-off Power (uptrim power);
iv) Speeds, V_1, V_r, V_2, V_{fri}, V_{climb};
v) Procedures if other than the aerodrome of departure is intended for recovery in the event of an emergency;
vi) Departure procedure;
vii) Climb profile;
viii) A statement of when the briefing is complete.

b) In the event that any of the items listed in the previous subsection are not included in the take-off briefing or if the PNF did not hear an item, the PNF shall query the PF to obtain the missing information.

c) An example of a Take-off briefing follows.

i) "This will be a 34,500 LB, flap 5 take-off using standard power settings. Speeds: V_1 – 93, V_r – 99, V_2 – 110 bugged, V_{fri} – 117, V_{climb} – 125. In the event of an emergency we will recover at ELSEWHERE which is our take-off alternate. Departure is a SOMEWHERE SIX, and we will use a type 2 climb profile. If there are no questions the briefing is complete."

3.9. Before Take-off Check

[Two common methods of designing checks for completing the before take-off requirements are:
— a single check that is divided into two sections, one for items completed before taxiing into the take-off position, and the second for after taxiing into position;
— two separate checks a "Before Take-off Check" that is completed before taxiing into the take-off position, and a "Runway Check" that is completed after taxiing into position.
In this section, specify the checks and crew coordination applicable to your operation. The example in this section is of single check with two sections.]

The Before Take-off Check should be requested by the PF approaching the take-off point. The PNF shall then complete the Before Take-off Check items above the separator line on the checklist. The PNF will then say "Complete down to the line" and hold the checklist with no further comment until requested by the PF to continue or until cleared by the ATC Tower for take-off. The PNF will then complete the check. The initial part of the Before Take-off Check is normally carried out prior to requesting take-off clearance. The expanded Before Take-off Check follows.

EMERGENCY PROCEDURES - EXPANDED

BEFORE TAKE-OFF CHECK (Challenge and Response)

Standby for Take-off (PNF/FA) **Cabin Secure**

It is necessary to establish contact with the Flight Attendant (FA) to ensure that the cabin is secure prior to take-off. Normally the public address system is chimed three times to about one minute before take-off to allow the FA to occupy their assigned station.

Flight Controls (PNF) **Checked**
The Flight Controls are unlocked at this point. Care should be taken in strong winds.

Bleeds (PNF) **OFF**
(PNF) **Complete down to the line**

The check should be held at this point until Take-off clearance is issued by Tower ATC or until requested by the PF

Transponder (PNF) **ON/ALT**

The transponder should be left at standby until as late as practical before take-off. Then, it should be set to ON and the Altitude Encoding turned on.

LANDING & A/COL Lights (PNF) **ON/WHITE**

Turning the Landing Lights on and the Anti-collision Lights to white should be delayed until clearance for take-off has been received from the ATC Tower. If the aerodrome is not controlled by a Tower then the lights should be selected as soon as the aircraft taxies onto the runway.

Altimeters (PF/PNF) **Checked**

The pilot and co-pilot altimeters should be checked against the runway elevation (if available) and against each other.

Compasses (PF/PNF) **Set/Checked**

The compasses should be set if required and compared to the runway bearing.

Before Take-off Check (PNF) **Complete**

3.10. Take-off Procedure

[Obviously the Take-off procedure must be tailored specifically to the aircraft type, operating environment, and company policy. In developing a take-off procedure the following should be considered.

— The flight deck should be as quiet a place as possible during take-off. The value of any calls made by the crew must be weighed against the possibility that the call may cause some critical hazard to be missed. Generally, if a call is not required to check a significant item or initiate an action, then it should not be made. For example, a call of "Take-off power set" or "Auto-feather Armed" is not useful if it is standard procedure that the PNF will not call V_1, but will initiate an abort of the take-off if those items are not achieved by a specified point.

— Although it is usually desirable to standardize procedures among dissimilar aircraft in the company fleet, great care must be exercised in doing so. It may be appropriate for the PF to keep a hand lightly rested on the power/thrust levers during take-off of one type of aircraft. However, it may be completely inappropriate to do so on another type of aircraft that requires both hands on the control yoke due to high control forces. Similarly, it is probably a very good idea to use a speed call prior to V_1 to cross check the pilot and co-pilot airspeed indicators on one type of aircraft, but useless on another where an onboard computer does a better job of the comparison.

— The use of back-up visual commands may be useful to avoid missing a key action. A visual command may be required during periods of excessive engine noise or radio traffic. Similarly, doing an action at a specific point in the take-off without having to be told reduces the likelihood that the action will not be done because the person did not hear the command due to radio transmissions. For example, during heavy radio traffic, the PF could use a visual signal to direct the PNF to raise the landing gear. The PNF would then select the flaps up and then proceed, as a standard procedure, to select IAS as the Flight Director vertical mode.]

a) General The following table describes the procedure to be used to carry out a normal take-off. It commences at the completion of the "Before Take-off Check" and ends immediately before the "After Take-off Check." Many of the actions described are to be carried out without specific direction. Flight Deck conversation (including calls) other than as indicated in the following table should be avoided during the take-off procedure. Guidance on aborting a take-off is provided in the chapter that deals with Abnormal and Emergency Procedures. Diagrams pertaining to take-off procedures are found in chapter 10.

[The example used is for a fictitious aircraft. In the example V_1 and V_r are equal and the aircraft has a Data Computer that gives all manner of annoying warnings if the airspeed indicators do not match. Also in the example, the PNF is authorized to initiate the abort of a take-off. See the Emergency & Abnormal chapter for more discussion on aborted take-offs. The aircraft in the example was designed and certified for a take-off procedure where the gear is retracted when the aircraft is in positive climb, but engine power and flaps remain at the take-off settings until at least 400 feet. If your

aircraft was not specifically designed for this type of procedure, it may be advantageous to adopt a variation of it. However, great care must be taken to not develop a procedure that could result in the overspeed of a component. In particular the pitch attitude near the ground (below 400 ft AGL) should not exceed the approximate pitch that would maintain the applicable speed subsequent to an engine failure. Exceeding such a pitch attitude could result in loss of control in the event of an engine failure. We recommend against specifying a pitch attitude in excess of the approximate engine out attitude in an attempt to gain altitude more quickly or keep speed low. In short, you must insert procedures that apply to your type of aircraft.]

b) Turns after Take-off [Insert guidance about the maximum bank angles allowed immediately after take-off. Such guidance is particular to your type of aircraft and operation. The following is an example only.] After take-off no turns are permitted prior to at least 400 feet above the departure end unless: required by ATC; for noise abatement; to prevent collision; part of a departure procedure that is required to clear obstacles. If a turn is appropriate after take-off the following limitations shall apply:

i) Turns are not permitted below 50 feet above the runway surface, before wheel retraction [delete if wheel retraction is not applicable], or a speed of V_2, whichever occurs last.

ii) Between the conditions described in the paragraph immediately above and 400 feet above the departure end of the runway a maximum bank angle of 15^o is permitted, but flaps shall not be retracted during bank.

iii) Higher than 400 feet above the departure end of the runway, a maximum bank angle of 30^o or a rate one turn (whichever requires the lesser bank angle) is permitted provided that the minimum speed is 1.3 V_s. If the speed is less than 1.3 V_s but not less than V_{climb}/V_2, the maximum bank angle is 15^o.

c) Reduction from Take-off Power Power shall not be reduced from the Take-off setting until the aircraft climbs to a safe altitude or 400 feet above the departure end of the runway whichever is higher. However, power shall be reduced no later than the time limit that applies to the power setting used. Flaps should be retracted before power is reduced.

d) Flap Retraction Flaps should not be retracted from the Take-off setting until the aircraft climbs to a safe altitude or 400 feet above the departure end of the runway, whichever is higher. However, flaps should be retracted prior to engine power reduction.

e) Division of Duties During take-off, the normal division of duties is as follows. Note that the order that the duties are presented does not imply any rank or importance.

i) Pilot Flying The main duty of the PF is simply to fly the aircraft within the applicable parameters. Any other duties stem from the main duty and include

commanding the PNF to make any selections to aircraft systems to support flying the aircraft within the applicable parameters.

ii) Pilot Not Flying The PNF duties consist of:

a) observing and, if applicable, calling critical performances as the aircraft achieves them;

b) confirming appropriate operation of aircraft systems;

c) making any selections to aircraft systems that are commanded by the PF;

d) setting of engine controls.

f) Operation of Controls During the entire take-off procedure the PF will manipulate the flight controls and, except for the initial power application, the PNF will manipulate the engine controls. During the take-off roll the PF will steer the aircraft using the rudder pedals to control the power nose wheel steering. Except in the event of a malfunction, neither brakes nor the tiller should be used unless adequate control is not available. For a crosswind take-off, into wind application of roll control is recommended. However, roll input should be kept to a maximum of 15^{o} of yoke deflection. Beyond 15^{o} excessive deployment of spoilers occurs.

g) Visual Signals during Take-off The following visual signals may be used during take-off to reinforce verbal calls and to reduce the possibility of a command being missed due to noise or radio traffic:

i) Landing Gear Retraction The visual signal to initiate landing gear retraction is an upward motion of a closed fist with the thumb extended vertically.

ii) Flap Retraction The visual signal to initiate flap retraction is an upward motion of a hand with the palm open and facing upward.

iii) Reduction to Climb Power The visual signal to initiate reduction to climb power is the rearward motion of a closed fist that is held horizontally.

[Your type of aircraft and/or operation may have several take-off procedures that are substantially different. If so, it may be appropriate to use individual tables for each different take-off procedure.]

Table 3-2 Normal Take-off – Procedure and Crew Coordination

PF	PNF

EMERGENCY PROCEDURES - EXPANDED

PF	PNF
For a pilot seat flown take-off move left hand from the steering tiller to the control yoke: – Announce "My wheel" For a co-pilot seat flown take-off retain right hand on the control yoke: – Announce "I have control"	For a pilot seat flown take-off release the control yoke: – Reply "Your wheel" For a co-pilot seat flown take-off release the control yoke: – Reply "You have control"
Advance the power levers toward the take-off power setting. If the take-off warning horn sounds, abort the take-off.	At 50% torque confirm Auto Feather ARM illuminated and roll spoilers are showing retracted on PFCS indicator. If above have occurred tap PF's hand from below and set Take-off Power. If above has not occurred call "Abort."
When the PNF taps the PF's hand from below, the PF should release the power levers but keep a hand resting lightly on top of them in case it is necessary to abort the take-off.	Set and maintain Take-off Power. To the extent possible monitor the engine instruments and caution indications.
At the V_1 call confirm the appropriate speed on the PF's airspeed indicator. If speed is appropriate place both hands on the control yoke to indicate understanding that V_1 has been achieved. Rotate the aircraft at a rate of about 2^o per second until the pitch attitude approximately matches the Flight Director command cue. Achieve a speed of V_2 to (if all engines are operating normally) V_2 + 10 KIAS.	Approaching V_1 make a final check of caution and engine indications. If all indications remain satisfactory, at the V_1/V_r speed; – Call "V_1".
	After lift-off confirm that the aircraft is climbing as indicated by the altimeter, the VSI and, if possible, visually. If the aircraft is in fact climbing: – Call "Positive Rate."
At the "Positive Rate" call, confirm a climb on the VSI and visually (if possible). If climbing: – Call "Gear Up" and give the visual signal to retract the landing gear.	Select the landing gear up. Monitor gear retraction. If gear retraction is normal say nothing. If there is a malfunction call "Unsafe Gear".
If the PNF advises that a landing gear malfunction has occurred do not exceed ___ KIAS. Retract flaps on schedule, climb to at least 1000 ft AGL and refer to	

PF	PNF
the appropriate abnormal procedure check.	
Climb at a speed of at least V_2 + 10 KIAS (if all engines are operating normally). At a safe altitude that is at least 400 ft above the departure runway accelerate to V_{fri} then: – Call "Flaps Up", and give the visual signal to retract the flaps.	Confirm that the aircraft speed is at least V_{fri} then select the flaps up, select IAS as the vertical mode of the Flight Director: – Call "IAS Selected".
Adjust the IAS using TCS or call for the PNF to set a particular speed using the thumb wheel. Do not exceed ____ KIAS until the Gear Up, Flaps Up call.	When flaps have fully retracted re-confirm that the gear is up: – Call "Gear Up, Flaps Up".
When the PNF calls "Gear Up, Flaps Up", if Take-off Power is no longer required: – Call "Set Climb Power" and give the visual signal to reduce to climb power. (If other than standard power is required at this point call for the specific power required, ie. "Set Max Continuous Power.")	Select the bleeds to ON and MAX. Then reduce to climb power or as directed and select the synchrophase on.
Climb to at least 2000 ft above the aerodrome elevation or to the cruise altitude (whichever is lower); or circuit/cleared altitude (during training): – Call "After Take-off Check", or the "Downwind Check" if applicable.	Carry out either the "After Take-off Check" as detailed in the next section or the "Downwind Check" as detailed in Normal Flight Procedures – Arrival chapter.

3.11. After Take-off Check

[The following example considers circumstances where a landing will be made shortly after the take-off. In such a case it may not be appropriate to do an After Take-off Check. Instead a check could be developed that includes only sufficient items to be completed as are needed for a short flight. Such a check could also be used during training. In this guide we have called such a check the "Downwind Check." However, it may be appropriate to use another name for your operation.]

The After Take-off Check should be completed at a convenient time but no less than 2000 ft above the aerodrome elevation, except when the final cruising altitude is less than 2000 ft in which case it should be done when level, but before the Cruise Check. The after take-off check should be called for by the PF and completed by the PNF. The expanded After Take-off Check follows. Note that for short flights, (ie., training, circuits, flights to a nearby aerodrome) it may be more appropriate to do a "Downwind Check" than an "After Take-off Check". See the chapter on Safe Operating Practices for guidance.

AFTER TAKE-OFF CHECK (PNF)

Landing Gear **Up**

Re-confirm that the landing gear is up. Also check that the gear doors have not partially opened with the change of airflow when the Flaps were retracted.

Flaps **Up**

Re-confirm that the Flaps are up.

Auto-feather **Off**
Bleeds **ON/MAX**
FASTEN BELTS Lights **a/r**

Depending on the flight conditions it may be appropriate to leave the FASTEN BELTS Lights ON. If it is intended to leave the FASTEN BELTS Lights ON, advise the Flight Attendant of reason (ie. turbulence) and expected duration.

After Take-off Check
Complete

3.12. Climb Procedures

[In this section insert the details of the climb procedure (or procedures if there is a choice of more than one) for your type of aircraft and the attendant crew coordination. In this example the PNF is responsible for engine power management, however, such a delegation is not mandatory. Use your own company procedure.]

a) General the use of all three types of climb profiles described in the flight manual are approved for normal use. During climb the PNF will normally handle the setting of all engine power.

[The specific procedures for climbing through FL100/10000 ASL will vary depending on your operation. Notifying the FA that the aircraft has climbed through 10,000 ft unpressurized is not a requirement, but is probably a good idea. The following example is for a pressurized aircraft.]

b) Through Transition, FL100/10000 ASL, FL180/18000, FL200/20000, FL300/30000 . Upon climbing through Transition, FL100/10000 ASL, FL180/18000 FL200/20000,

FL300/30000 ASL the following crew coordination actions and calls shall be carried out.

Table 3-3 Climb Through Transition, FL100/10000 ASL, FL180/18000, FL200/20000, FL300/30000 Procedure and Crew Coordination

PF	PNF
Upon climbing through Transition, FL100/10000, FL180/18000 FL200/20000, FL300/30000 ASL confirm the altitude alert and flight guidance settings: – Call "Through 10000 (or FL100) FL180/18000, FL200/20000, FL300/30000, for target altitude (ie,. 13000 or FL130), Altitude Select." – Call Altimeter 29.92	Confirm the altitude alert and flight guidance settings, turn off the landing and taxi lights (if they were on), check that pressurization is functioning normally, respond: – "Check, Lights OFF, Pressurization Checked." – Check 29.92 set

c) Interrupted Climb On occasion it will be necessary to interrupt the climb for traffic, weather, or other reasons. If the interruption is of short duration it is recommended that power remain set for climb and speed allowed to increase. The increased speed would be used for the initial portion of the re-established climb. Speed limitations in controlled airspace may be found in the AIP. For an extended interruption in climb, the aircraft should be set to cruise configuration until climb is continued.

3.13. Holding/Shuttle Procedures Departure/Climb

a) Aircraft Configuration [Specify the procedure that applies to your type of aircraft for climbing in a hold or shuttle. Include such information as: speed, flap setting, engine power, and icing considerations. An example follows.] For a climb in a hold, or shuttle climb, use the holding speed and flap setting that is used for a hold during arrival. Normal climb power should be used for a climb in a hold, or shuttle climb. Should icing conditions be encountered, the normal ice protection procedures should be followed. If the speed for inflight icing is in excess of the maximum speed published for the shuttle, climb at the maximum shuttle speed and use up to maximum continuous power to exit icing conditions as soon as possible.

b) Navigation [In this sub-section discuss set-up of navigation aids (in particular RNAV systems) and crew coordination (include which flight crew member does the timing during a holding/shuttle procedure)].

Annex A to Chapter 3

NORMAL FLIGHT PROCEDURES DEPARTURE, ABBREVIATED CHECKLISTS

[The following is an example only. Insert procedures that are used in your operation that are applicable to your aircraft as per the Aircraft Flight Manual.]

Introduction

The abbreviated form of the Departure checklists follow.

ENGINE START CHECK (PF/PNF)

Engines	(PF/PNF) **Clear**
START SELECT Switch	(PF) **Select #2**
STARTER Switchlight	(PF) **Press**
Clock	(PNF) **Start timing**
Condition Lever (___-___% N_H)	(PF) **START/FEATHER**
Fuel Flow	(PF) **Confirm**
ITT	(PF) **Indication within ___ secs**
Oil Pressure	(PF) **Indication**

NOTE

Minimum oil pressure by completion of engine spool-up during start is ___ PSI. If ___ PSI is not reached by end of spool-up engine must be shut down.

Hydraulic Pressure	(PF) **Indication**
Starter	(PF) **Cut out at approx ___% N_H**
Engine Stabilized	(PF) **Stabilized at approx ___% N_H**
Bleed Air	(PNF) **#2 Bleed ON/MIN**
Repeat above to start No 1 Engine	
Engine Start	(PF) **Complete**

TAXI CHECK (Challenge and Response)

Brakes	(PF) **Checked**
Flight Instruments	(PF/PNF) **Checked**
Altimeters	(All) **XXXX inches Set**
APU	(PNF) **Shutdown**
Take-off Briefing	(PF) **Complete**

Taxi Check	(PNF) **Complete**

RUN-UP CHECK (Challenge and Response)

EMERGENCY BRAKES	(PF) **PARK**
Magnetos	(PF) **Checked**
Engine RPM	(PF) **Set to ____ RPM**
Propellers	**Exercised**
Run-up Check	**Complete**

BEFORE TAKE-OFF CHECK (Challenge and Response)

Standby for Take-off	(FA) **Cabin Secure**
Flight Controls	(PNF) **Checked**
Bleeds	(PNF) **OFF**
	(PNF) **Complete down to the line**

Transponder	(PNF) **ON/ALT**
LANDING & A/COL Lights	(PNF) **ON/WHITE**
Altimeters	(PF/PNF) **Checked**
Compasses	(PF/PNF) **Set/Checked**
Before Take-off Check	(PNF) **Complete**

AFTER TAKE-OFF CHECK (PNF)

Landing Gear	**Up**
Flaps	**Up**
Auto-feather	**Off**
Bleeds	**ON/MAX**
FASTEN BELTS Lights	**a/r**
After Take-off Check	**Complete**

Chapter 4. Normal Flight Procedures - Cruise

4.1. Introduction

This chapter of the SOPs, "Cruise", provides guidance for normal operations from and including the level-off at top of climb, through to but not including the before descent activities.

4.2. Cruise Check

The Cruise Check is to be done only if an After Take-off Check has been completed. If an After Take-off Check has not been completed, as would occur for a short flight, a Downwind Check is to be done, and the Cruise Check omitted. Upon reaching the target cruising altitude the PF shall make the required level call and allow the aircraft to accelerate to the planned cruise speed. Approaching the planned cruise speed the PF should call "Cruise Check." The PNF will then acknowledge, make any radio transmissions, and complete the Cruise Check as follows.

CRUISE CHECK (PNF)

Power **Set**

Set the appropriate cruise power for the temperature, altitude and planned cruise profile.

NOTE

It may be necessary to reset the engine power after the aircraft speed has stabilized.

Altimeters **Checked**

As the altimeters should have already been set as consequence of other events (such as climb through transition) there should be no requirement, other than for the PNF, to visually check the PF/PNF's altimeters for correct setting.

Pressurization Checked

Confirm sufficient fuel for the planned flight. If appropriate begin a fuel log.

Cruise Check Complete

4.3. Engine Management

After the aircraft is established in cruise the PNF should compute the following engine power settings. The settings should be placarded and brought to the attention of the PF.

a) Maximum Cruise Power;

b) Maximum Continuous Power.

4.4. Periodic Checks

Periodically during cruise, but no less than once per hour, each flight crew member shall carry out a visual check of the displays and controls on the flight deck. Should an inappropriate condition be found the applicable action shall be taken. Should a significant change in atmospheric conditions have occurred since the last check, the engine power settings described in the Engine Management section should be recomputed.

4.5. Navigation

[It is not possible for us to make very detailed recommendations about standard procedures for navigation. The subject has too many variables. However, we have indicated a few subject areas that you may wish to address for your operation.]

a) General To the extent practical all available navigation equipment should be set to provide navigation information. Guidance for use of RNAV systems is found in the next section.

b) Navigation Displays [Information on set-up of Navigation Displays is found in Chapter 1. Additional guidance for the en route phase of flight may be inserted here.]

c) Compass Setting Procedures [In this sub-section discuss the following as it applies to your operation.

i) If the compass system on your aircraft is not magnetically synchronized, insert the setting procedures for en route flight.
ii) If you operate into the Northern Domestic Airspace (area of compass unreliability) discuss the compass setting and astro navigation procedures here.]

4.6. FMS/GPS/INS/RNAV Procedures

[If the aircraft type that the SOPs refer to is not equipped with an RNAV system do not include this section.]

[The requirements for use of RNAV (which includes the use of FMS, GPS, and INS) is specified in areas of the CARs standards other than those that pertain to the SOPs. However, the safe and effective use of Area Navigation Systems invariably requires crew coordination. Therefore, RNAV is discussed in this chapter.]

[In this section describe the RNAV procedures that are applicable to your: type of aircraft, operation, company policy. Include (if applicable) any route offset procedures.]

a) General [Insert relevant general company policy statements on use of RNAV during the en route phase of flight – a sample follows.] During the en route phase of flight RNAV equipment is to be used to the extent practical to minimize flight time and generally improve the efficiency of the operation.

b) Navigation and Display As the best check of an RNAV system's performance is another RNAV system, where two or more systems are available, they should be used to verify the performance of each other. To the extent practical, without interfering with the operation of the RNAV systems, the remaining NAVAIDS should be selected to provide additional position information and foster the crew's situational awareness. When primary navigation of the aircraft is by RNAV, the information should be displayed to both the PF and PNF.

c) Routing Changes When a change of routing is required, the following procedure should be followed.

i) The PF (if the autoflight system is on) or the PNF (if it is off) should enter the route into the RNAV system.
ii) At each stage of the entry process the other pilot should verify that data has been entered correctly. To the extent possible, the reverse path verification procedure described in the Departure chapter should be used. Waypoints that have been previously verified since the last data base entry need only be checked to confirm that the correct waypoint has been selected. Only once the routing has been verified is navigation using the RNAV permitted.
iii) The PNF's RNAV should be programmed the same as the PF's. If possible, the data should be transferred electronically rather than manually.
iv) Should a significant period of time be necessary to complete the programming, ATC should be notified of any delays due to programming.

4.7. Holding Procedures – En Route

a) Aircraft Configuration [Specify the procedure that applies to your type of aircraft for hold during the en route phase of flight. Include such information as: speed, flap setting, engine power, and icing considerations.]

b) Navigation [In this sub-section discuss set-up of navigation aids (in particular RNAV systems), and crew coordination (include which flight crew member does the timing during a holding procedure)].

Annex A to Chapter 4

NORMAL FLIGHT PROCEDURES CRUISE, ABBREVIATED CHECKLISTS

[The following is an example only. Insert procedures that are used in your operation that are applicable to your aircraft as per the Aircraft Flight Manual.]

Introduction

The abbreviated form of the Cruise checklists follow.

CRUISE CHECK (PNF)

Power	Set

NOTE

It may be necessary to reset the engine power after the aircraft speed has stabilized.

Altimeters	Checked
Pressurization	Checked
Fuel	Checked
Cruise Check	Complete

Chapter 5. Normal Flight Procedures - Arrival

5.1. Introduction

This chapter of SOPs, "Arrival" provides guidance for normal operations from and including the before descent activities through to and including shutdown of the power plants at the completion of the flight. Included in this chapter are procedures for missed approaches with the aircraft operating normally.

5.2. Standard Calls

Some standard calls apply primarily during the arrival phase. These are described in the following paragraphs:

a) Flaps to Approach Setting To initiate the setting of flaps to the Approach setting, the PF uses the standard call "Flaps Approach". For other than during the Before Landing Check, the PNF responds by selecting the flaps to the Approach setting and saying "Flaps Approach Selected." When the flaps have travelled to the Approach setting, the PNF should call "Flaps Approach Set." The responses during the Before Landing Check are discussed in the relevant section.

b) Flaps to Take-off Setting To initiate the setting of flaps to the Take-off setting, the PF uses the standard call "Flaps Take-off". The PNF responds by selecting the flaps to the Take-off setting and saying "Flaps Take-off Selected." When the flaps have travelled to the Take-off setting the PNF should call "Flaps Take-off Set."

c) Flaps to Fully Extended Setting To initiate the setting of flaps to the Full setting, the PF uses the standard call "Flaps Full". For other than during the Final Landing Check, the PNF responds by selecting the flaps to the Full setting and saying "Flaps Full Selected." When the flaps have travelled to the Full setting the PNF should call "Flaps Take-off Set." The responses during the Final Landing Check are discussed in the relevant section.

d) Landing Gear Extension Landing Gear Extension is normally initiated by calling for the before landing check. To initiate the extension of the landing gear when it is inappropriate to complete the Before Landing Check, the PF calls "Gear Down". The PNF responds by selecting the Landing Gear Lever down and saying "Gear Down." Once the Landing Gear is down and locked the PNF should call "Gear Down and Locked."

5.3. Descent Check

The purpose of the Descent Check is to transition from cruise flight to the descent in preparation for arrival. In order to address some of the items that were affected during the After Take-off check, the Descent Check shall be completed any time that an After Take-off check was done. A Descent Check, therefore, need not be done for short flights where a "Downwind Check" is to be done. The Descent Check is ideally completed before commencing the first descent from cruising altitude. Depending on circumstance, it may be appropriate to carry out some of the descent before completing the descent check. For example, a very early, but small, descent initiated by ATC to facilitate traffic flow would not necessarily trigger the Descent Check. However, the Descent Check must be done in sufficient time to permit completion of the remaining checks before landing. The expanded Descent Check follows.

DESCENT CHECK (Challenge and Response)

Pressurization (PNF) **Set**

Set cabin pressurization controller to destination altitude and altimeter setting. Check cabin rate at default setting or select computed descent rate if required.

Landing Data (PNF) **Computed & placarded**
Approach Briefing (PF) **Complete**

The format in the section titled Approach Briefing shall be used for this briefing.

Passenger Briefing (PNF) **Complete**

The format in the section titled Passenger Briefing shall be used for this briefing.

Descent Check (PNF) **Complete**

5.4. Approach Briefing

[In the following example we have used the AMORTS format as a guide for briefing. For your operation use whatever meets your requirements. If you choose to use the AMORTS format, note that you should make modifications to the following guide to suit your operation. Whichever format you choose, it should be standardized throughout your operation.]

[To the extent practical the Approach briefing should be concise. It is not necessary to repeat standard items and procedures. For example, if it is always a standard procedure that for a missed

approach the PF calls "Go Around" and begins setting the power, there is no need to repeat this fact. The items that should be included in the Approach briefing are those that change routinely (ie., speeds that change with weight) or items that are normally standard but are different for this particular approach (ie, a higher than normal approach speed category due to icing). Similarly, much of the information that is published in Flight Information Publications such as the CAP need not be repeated, ie., briefing all of the headings and tracks that are published on the approach plate is probably not worthwhile. Depending on the circumstances and the type of aircraft, the Approach briefing may be very simple or quite complex. In setting a company policy for briefings, consider that short simple briefings are more likely to be understood and remembered than ones that are long and complex but very complete.]

a) General Prior to each approach and landing, the flight crew shall be briefed on the critical aspects of the procedure. The approach should be briefed by the pilot who will fly the procedure. If it is inadvisable for the pilot that will fly the approach to brief the procedure (due to a malfunction, workload, or other unusual situation) the other pilot may do the briefing. The briefer should not be manually flying the aircraft during the briefing. Either the autopilot should be used, or control should be passed to the other pilot. During the actual approach, the flight crew is to compare the procedure as it is flown to the what was briefed. Should a deviation become apparent to the PNF or crew other than the PF, it shall be brought to the attention of the PF. The PF shall either correct the deviation or, if appropriate, indicate that the deviation is intentional and state the revised parameters or procedure. If it is appropriate to deviate from the briefed procedure, the PF shall advise the remaining flight crew members of the change.

b) Format Approaches should be briefed using the format described in the following paragraphs. The format is known by the acronym "AMORTS"; the letters of which are taken from the first letter of each of the topics that make up the briefing format. If a particular item is not applicable to the procedure to be flown, it may be indicated as not applicable, ie, for a visual approach brief "Timing is not applicable." In all cases, each item should be addressed. Where a topic contains several items or choices, the order of briefing should be in the same order as that shown. Examples are shown in brackets "( )."

c) Approach Choose from the following:

i) Procedure to transition from en route flight (STAR, Profile Descent Procedure, IFR Descent to VMC, Radar vectors, Full Procedure, Straight-in; Circuit joining procedure);

ii) Type of approach, (NDB RWY 08, Contact Approach to RWY 36, VFR Circuit to RWY 25, Visual Approach to RWY 23, GPS RWY 16 Circling to RWY 22);

iii) CAP page(s) that the procedure(s) is/are found on (DALLY SEVEN Arrival on page 14, to a CONVERGING ILS RWY 34 on page 24);

[If your organization uses a Terminal Flight Procedures Publication other than the CAP or if you permit individual pages to be removed from the CAP, it may be useful to include the effective date of the page. If your organization uses whole volumes of the CAP, it may be better to brief which pages are applicable rather than the effective date.]

iv) Use of Autopilot and/or Flight Director, or raw data;

d) Minima Specify the following:

v) For an instrument approach, any minimum altitude after the FAF or intercept of the final approach track up to the MAP/MAWP, including the temperature correction, (MDA, DH, Step-down fix crossing altitude);

vi) For an instrument approach, only those altitudes other than those specified above that a temperature correction has been applied to;

[Although there may be some advantage to stating other altitudes, it may be outweighed by increasing the length and complexity of the briefing. Also, in an ever more complex environment the number of designated altitudes that may apply during an arrival is increasing constantly with no end in sight! Therefore, we recommend briefing of the altitudes specified above and allow the applicable pilot to read the others from the charts, if they are required.]

vii) The altitude to be set into the altitude alerter/reminder [if applicable];

viii) The Radio Altimeter alert/warning/decision height;

ix) For a visual approach or for a VFR circuit, specify the Circuit Altitude or any other relevant altitude.

[We recommend avoiding briefing of the altitudes that the PNF is to call out. The altitude call out procedures should be standard and should be detailed elsewhere in the SOPs.]

e) Overshoot Specify the following:

x) The missed approach procedure to be flown (as published/as directed by ATC, VFR to the circuit, detailed briefing).

[In most cases the missed approach procedure brief should be very short. If the procedure is published on the approach chart and the crew is familiar with it, a brief of "as published or as directed by ATC" is quite acceptable. Similarly, a missed brief of VFR to the circuit is often adequate. If the missed approach is complex and/or the crew is unfamiliar with it, a detailed briefing should be done.]

xi) Engine power settings and aircraft handling to be used if other than standard.

[If the engine and aircraft handling is standard during a missed approach it is not required to brief anything for handling. If power settings change with altitude and temperature then the applicable settings should be briefed.]

f) Radios Specify the radio set-up to be used during the approach. Note that actual set-up and identification of NAVAIDS should not be carried out during the briefing. Specify the course and/or heading settings to be set on the relevant indicators.

[If practical for your operation, it is probably wise to set standard sequence for briefing the radio set-up. If a standard order is established, should something be missed, it is more likely that someone will notice. Often it is useful to specify radio set-up in an order that makes sense geographically on the flight deck, ie., refer the radio control heads as they are located, left to right then top to bottom. Also, if a radio or NAVAID is completely irrelevant to the approach, do not discuss it, ie., if the HF is not to be used don't waste briefing time on it.]

g) Transition and Timing Specify the transition altitude that altimeters are to be changed from Standard Pressure to Local Station Pressure. Specify the timing to the missed approach point if it is applicable for the approach to be flown.

h) Speeds and Supplementary Remarks Choose from the following:

xii) Approach weight;

xiii) Flap setting for approach and landing, (include type of landing if applicable, ie., short field technique);

xiv) V_{app};

xv) V_{ref}

xvi) V_2 or $V_{go\ around}$;

xvii) V_{fri} or applicable flap retraction speed for missed approach (if not standard);

xviii) V_{climb}, V_{sse}, V_{xse}, V_{yse}, or as applicable;

xix) Circling procedures;

xx) Special Circuit procedures;

xxi) Ice protection procedures;

xxii) Any special considerations or other relevant remarks.

i) Sample Instrument Approach Briefing The following is a sample of a briefing for an instrument approach as given by the pilot who will fly the approach.

"This will be a Profile Descent Runway 06 Left and Right on page 224, then radar vectors or direct to the NORTH Initial Approach Waypoint for a GPS Runway 06 Left, with circling to Runway 33 found on page 230. I will use the autopilot until the Intermediate Waypoint. Then, I will hand fly the remainder of the approach and circling procedure using the Flight Director. We will use a temperature correction for -10°C. For the Step-down along track distance fix a correction of 40 ft gives a minimum altitude of 880 ft. For the MDA the correction is 20 ft for minima of 640 ft which set on the altitude reminder. Set the Rad Alt to 270 ft. The overshoot, if required will be as published or as directed by ATC using ___% power and ___% flap. The GPSs will both be set to the GPS Runway 06 Left when they are no longer needed for en route. The ILSs are off the air, so set the VORs primary frequency to 115.55 and secondary to the alternate 112.3. The NDBs are also off the air so set them to the alternate 250. Transition is at 18000 ft. Timing is not applicable. Our approach weight is _____ LBS. We will circle at ___% Flap. Once on final we will select full flap for landing. V_{app} is _____. We will use V_{ref} of _____ for circling and final. $V_{go\ around}$ is ___, V_{fri} is ___, and V_{climb} is _____. As directed by ATC we will cross over the centre of the airport and circle right for Runway 33. The ice protection systems will be selected on during the "In Range Check" and due to possible icing the propellers will be set to max prior to the Final Approach Waypoint. Do you have any questions?"

j) Sample Visual/Contact Approach Briefing The following is a sample of a briefing for a visual approach that has a published procedure. A briefing for a contact approach or a visual approach without a published procedure will be similar.

"This will be a SANDHEADS VISUAL Approach to Runway 08 found on page 119. I will use the autopilot until on final then I will hand fly. Altitudes are as published. The overshoot if required will be VFR to the circuit, using ___% power and Flap ___. Max power if required will be _____%. The VORs should be set to the Localizer/DME 109.5. No transition or timing. This will be an _____ LB, ___% Flap landing. V_{app} is ___. V_{ref} ___. V_2 is ___. V_{yse} is _____. Do you have any questions?"

k) Sample VFR Circuit Briefing The following is a sample of a briefing for joining and landing from a VFR circuit.

"This will be a right hand VFR Circuit as published for Runway 16. We will join on downwind. I will hand fly approaching the circuit. The circuit altitude is 1500 ft. The overshoot if required will be VFR back to the circuit, using standard power and configuration. For radios: switch to the MF at 15 miles, set the GPS direct to the threshold Runway 16. No transition or timing. This will be a _____ LB, ___% Flap landing. Speeds are standard. Do you have any questions?"

5.5. Passenger Briefing

[Although the Passenger Briefing requirement has been listed in the Descent Check, depending on your operation, it may be more appropriate to include it in the In-Range Check. Specify which crewmember is to complete the passenger briefing as well as items that should be included. Additional guidance on the contents of passenger briefings is available in the CARs and related standards, as well as from your Transport Canada regional office.]

a) The pre-arrival passenger briefing should be completed before the Descent Check. Confirmation of completion is an item in the Descent Check. The briefing is to be carried out by the PNF [or if applicable by the FA with input from the pilots] and should include (but not be restricted to) the following items:

i) Phase of flight;

ii) Approximate time to landing and arrival at the terminal;

iii) Weather at the destination and, if applicable, during descent;

iv) Requirement to fasten safety belts;

v) Requirement to place seat backs in the upright position [delete if your aircraft seats do not recline];

vi) Requirement to stow trays/tables or place them in the upright position (if applicable);

vii) Requirement to stow all carry on baggage;

viii) Confirmation that smoking is not permitted;

ix) Emergency exits location (if applicable) [Briefing the location of the emergency exits during the pre-arrival briefing is not usually required. Check the CARs and Standards for applicability.];

x) Wearing of outdoor clothing during arrival (if appropriate in the expected weather conditions); and

xi) Requirement for escort while walking on aprons (if applicable).

b) An example of pre-arrival briefing follows:

"Good afternoon I'm First Officer Martin. We will be commencing descent for arrival at Somewhere shortly and expect to land in fifteen minutes. We should arrive at the

terminal a few minutes later. The weather at Someplace is overcast, light snow, visibility of 10 KM, temperature of -25°C, and a wind from the northwest at 20 KM/H. We expect light turbulence and icing during descent. You may hear some pieces of ice hitting the fuselage as it sheds from the propellers; this is completely normal. The seat belt light will be turned on in a few minutes. At that time please fasten your seat belts and leave them fastened until the aircraft comes to a complete stop at the terminal. Also stow your table trays and carry on baggage, and place your seat backs in the upright position. I must remind you that smoking is not permitted on this flight. Please note the emergency exits at the left front of the aircraft and over the wings. Their use is described in the aircraft safety features card in front of you. Due to the inclement weather, we recommend that you wear your outdoor clothing during arrival. For your safety and security please wait for a crew member to escort you to the terminal building. We hope you have enjoyed your flight. Thank you.

5.6. Descent Procedures

[In this section insert the details of the descent procedure (or procedures if there is a choice of more than one) for your type of aircraft and the attendant crew coordination.]

a) General The use of all three types of descent profiles described in the flight manual are approved for normal use. In most cases a type 2 profile will be most advantageous. This information must be used with the guidance provided in the sections that discuss Approach Procedures.

[The specific procedures for descending through FL100/10000 ASL will vary depending on your operation. Notifying the FA that the aircraft has descended through 10,000 ft unpressurized is not a requirement, but is probably a good idea. The following example is for a pressurized aircraft.]

b) FL100/10000 ASL Upon descending through FL100/10000 ASL the following crew coordination actions and calls shall be carried out.

c) Interrupted Descent It will sometimes be necessary to interrupt the descent for traffic, weather, or other reasons. Regardless of the anticipated duration of the interrupted descent sufficient power is to be set to maintain sufficient speed during level flight. The approximate power setting to be used shall be briefed by the PF. Speed limitations in controlled airspace may be found in the AIP. For an extended interruption in descent, the aircraft should be set to cruise configuration until descent is continued.

Table 5-1 Descent Through FL100/10000 ASL Procedure and Crew Coordination

PF	PNF
Descending through FL100/10000 ASL confirm the altitude alert and flight guidance settings:	Confirm the altitude alert and flight guidance settings, turn on the landing and taxi lights, check pressurization is

– Call "Through 10000 (or FL100) for target altitude (ie,. 8000 or FL080), Altitude Select."	functioning, respond: – "Check, Lights OFF, Pressurization Checked."

5.7. Holding/Shuttle Procedures – Arrival

a) General The discussion in this section pertains to holding and shuttle procedures during arrival. Instrument Approach considerations are found later in this chapter. However, much of the information on holds and shuttles that applies to arrivals in general, applies as well to instrument approaches.

b) Aircraft Configuration [Specify the procedure that applies to your type of aircraft for a hold or shuttle during arrival. Include such information as: speed, flap setting, engine power, and icing considerations. An example follows.] During a hold or shuttle, use a target holding speed of _____ KIAS and flap setting of ___%. A power setting of about ____% will be required. To minimize fuel burn, a constant power setting should be used and the speed allowed to vary slightly during turns. Should icing conditions be encountered, the normal ice protection procedures should be followed and a speed of ____ KIAS should be used with zero flap. If the speed for inflight icing is in excess of the maximum speed published for the hold/shuttle, hold at the maximum hold/shuttle speed and exit icing conditions as soon as possible or, if possible, obtain clearance from ATC for higher speed. Plan flight so as to enter the holding/shuttle procedure at no more than the maximum permissible speed.

c) Operational Considerations If the purpose of the hold is to wait until commencing an approach, ensure that sufficient fuel is available and that the weather is satisfactory for the planned procedure. If either is unsuitable, proceed to an alternate destination. If fuel and weather are suitable, consider reducing speed prior to entering the hold if a fuel saving can be realized. Note that a speed reduction while flying in controlled airspace may require approval from ATC. See the AIP for speed change limitations.

d) Crew Coordination Before commencing a hold/shuttle procedure, the PF should brief the PNF on the procedure to be flown. The briefing should contain at least the following information:

i) the dimensions of the hold/shuttle, ie., timings or distances;

ii) entry procedure;

iii) aircraft configuration (speed, flap setting, etc).

iv) The PNF should verify that the information is appropriate and advise the PF if changes are required.

e) Navigation [In this subsection discuss set-up of navigation aids (in particular RNAV systems) and crew coordination (include which flight crew member does the timing during a holding/shuttle procedure)].

5.8. In-Range Check

[Although we have titled this section as "In-Range Check", the title is largely arbitrary. Use whatever best suits your operation and aircraft. In designating items for the In-Range Check consider the desirability of completing items as early as possible to minimize the Before Landing Check when the workload is likely to be higher.]

The purpose of the In-Range Check is to transition from initial descent to operations in the destination terminal area in preparation for approach. In order to address some of the items that were affected during the After Take-off check, the In-Range Check shall be completed any time that an After Take-off check was done. An In-Range Check, therefore, need not be done for short flights where a "Downwind Check" is to be done. The In-Range Check is ideally completed before commencing an Instrument Approach. For a Visual Approach, Contact Approach, or VFR Circuit, the In-Range Check should be completed 15 to 30 NM or 10 to 15 minutes from landing. [The distances and times mentioned in the previous sentence should be adjusted to suit your aircraft and operation.] At the completion of the In-Range Check the cabin and passengers should be secured for landing. The expanded In-Range Check follows.

IN-RANGE CHECK (PNF)

Ignition	**a/r**

Ignition may be set to NORMAL or MANUAL at the Captain's discretion. It must be set to MANUAL for flight in any icing, heavy rain, or moderate or greater turbulence.

FASTEN BELTS Lights	**ON**
Harnesses	(PF/PNF/FA/Cabin) **Secure**

If without a FA, the PF shall visually confirm the security of cabin and passengers' harnesses.

Altimeters	(PF/PNF) **Set**
In-Range Check	**Complete**

5.9. Downwind Check

a) General The Downwind Check is to be done on short flights between nearby aerodromes or during some training flights. A Downwind Check is only to be done

whenever an After Take-off Check and the Cruise Check have not been done. More specifically the Downwind Check replaces the following checks: After Take-off, Cruise, Descent, In-Range. It must be done prior to the Before Landing Check. The Downwind Check should be completed at approximately the following points of various types of short flights:

i) upon reaching the altitude for transit on a short flight between two nearby aerodromes;

ii) upon turning onto the downwind leg for circuits (normally during a training flight);

iii) prior to commencing an instrument approach procedure on a local flight;

iv) prior to commencing another instrument approach at the same aerodrome after a missed approach from a previous procedure.

b) Expanded Check The expanded form of the Downwind Check follows.

DOWNWIND CHECK (PNF)

Autofeather	**Off**
Bleeds	**ON**
Approach Briefing	(PF) **Complete**

See the section on approach briefings for the required content.

Downwind Check	**Complete**

5.10. Before Landing Check

[The contents of the Before Landing Check obviously must be tailored to the individual type aircraft. In developing it consider whether all of the items that need to be completed can be addressed without a substantial break in the check. It may be appropriate to develop a separate Final Landing Check to address items that should be delayed until the last part of the approach or until landing is assured. This section and the next are examples for an aircraft that is best operated with two such checks. In most cases, it would be preferable to actually do such items as extending the landing gear and flaps during this check. However, we recognize that for some aircraft it is necessary to carry out some actions separately, then confirm that they have been done during the Before Landing Check. The following example is for a check done from memory. This is not mandatory. In your operation it may be more appropriate to refer to the checklist.]

Direction as to when the Before Landing Check is to be done is contained in the applicable sections that discuss the various types of approaches. The Before Landing Check is the first

of two checks that are used to configure the aircraft specifically for landing. As this check may be done during an especially high workload period of the fight, it is to be carried out from memory. The expanded Before Landing Check follows:

- **BEFORE LANDING CHECK (PNF)**

Landing Gear Lever **Down**

The landing gear is selected down as the first action following the PF's call for the Before Landing Check.

Synchrophase (Co-pilot) **OFF**

The synchrophase is selected off by the co-pilot, as the switch cannot be easily reached from the pilot's seat.

Propellers ___**% or Max**

Use ___% for most landings. Use Max: if turbulence or wind shear is a consideration; if a missed approach is likely; or for landing using minimum runway length. Propellers are to be set to ___% unless specifically requested by the PF or the Captain.

Flaps **Approach Selected or Up**

Flaps are not selected to approach until called for by the PF. The check shall be held until flaps are selected unless a flapless landing is planned. If flapless landing is planned the PNF would call "Flaps Selected Up" at this point and continue with the check.

Warning/Caution Panel **Checked**

Check that no new indications are displayed on the Warning/Caution Panel

Landing Gear **Down and Locked**

Before stating that the landing gear is down the PNF shall check the following indications: 3 green "DN" annunciator lights are illuminated; the amber "DOOR" annunciator lights are out; and the amber lights in the gear selector handle are out.

Flaps **Approach Set**

When the Flap Position Indicator shows that the flaps have travelled to the approach position the PNF will call Approach Set.

Before Landing Check **Complete**

5.11. Final Landing Check

[Like the Before Landing Check, the Final Landing Check contents must be tailored to the individual type of aircraft. It may not even be appropriate for your aircraft to have such a check. Such a check would typically be useful if your aircraft:
- sometimes (or always) requires the deployment of additional flap only once landing is assured;
- requires a last check that the landing gear is safely extended just before landing;
- requires that engine bleed air or a heating/cooling system be turned off immediately before landing or missed approach; and/or
- requires a change to propeller setting once landing is assured.]

a) General The Final Landing Check is the second of two checks that are used to configure the aircraft specifically for landing. As this check may be done during an especially high workload period and at a time when flight deck lighting may be subdued to reduce glare, it is to be carried out from memory. The Final Landing Check should be called for by the PF. However, it is normally commenced at the following points of various types of approaches after the Before Landing Check has been completed.

i) For Visual Approaches, Contact Approaches, and VFR Circuits, between 1,000 and 500 feet above landing.

ii) For Category I Precision Approaches and all Non-Precision Approaches, immediately after the "100 Above" call.

iii) For Category II or III Precision Approaches, between 1,000 and 500 feet above landing.

b) Expanded Final Landing Check The expanded Final Landing Check follows:

FINAL LANDING CHECK (PNF)

Bleeds **OFF**
The bleeds must be selected off as the SAMPLE aircraft is not approved for landing or go around with the bleeds on.

Flaps **Approach/Land Selected or Up**

At the PF's direction, the Flaps are to be selected to Land. For landings where no change in flap setting is to be carried out, the PNF does not change the setting but does confirm that the selection is correct.

Flaps **Approach/Land Set or Up**

When the Flap Position Indicator shows that the flaps have travelled to the approach or land position the PNF will call Approach or Land Set. If the flaps are to remain up, the PNF should confirm the position and call "Flaps are Up."

Final Landing Check **Complete**

5.12. Approach Procedures – General

a) The discussion on approach procedures is divided into areas which discussed within the next few sections. For the SOPs, "Approach" is essentially from the latter part of the descent from en route flight to, but not including, the final manoeuvring for and the actual landing. The discussions on landings are in separate sections. The sections of discussion for Approaches are:

i) Instrument Approach Procedures Initial/Intermediate;

ii) Instrument Approach Procedures Intermediate/Final;

iii) Circling Procedures;

iv) Contact/Visual Approaches and VFR Circuits; and

v) Missed Approaches.

[The intent is to provide crews with sets of tools that can be picked from to meet changing requirements through the arrival process.]

b) Common Procedures The following procedures are common to most approaches:

i) In most cases navigation equipment should remain set for en route navigation until the following. Then navigation equipment should be set for the approach procedure to be flown.

a) Navigation equipment should be selected from the en route requirement to the approach requirement upon first receipt of an ATC vector for arrival.

b) Upon beginning a STAR or Profile Descent, select the navigation equipment as required for the procedure. Set other equipment for the approach to be flown.

c) Upon receiving clearance for an instrument approach, set navigation equipment for the instrument approach to be flown.

ii) When operating in controlled airspace do not arm Flight Guidance equipment until actually receiving clearance for the procedure. However, it is recommended that the expected procedure be pre-selected in standby status awaiting clearance from ATC.

iii) When flying a published procedure that includes minimum and/or maximum altitudes, it is recommended that the next published altitude be pre-selected in stand-by status awaiting acquisition.

iv) To the extent practical the next communication frequency that is expected to be used should be in standby.

c) (ref. CARs) Ensure aircraft speed does not exceed 250 KIAS below 10000 ASL, nor 200 KIAS below 3000 AGL within 10 NM of a controlled airport.

i) Instrument Approach Procedures in VMC Often, all or part of an Instrument Approach Procedure is flown in VMC. Unless specified by the PF that the instrument approach is to be discontinued or unless the PF calls "Landing", all of the actions and calls associated with the instrument approach are to be carried out. After the initial call by the PNF of "Visual", the PNF will again call visual at the applicable point during the approach, ie. at DH for a precision approach or at MDA and the appropriate distance for a non-precision approach. During instrument approaches in VMC the PNF must be especially vigilant in searching visually for other traffic.

5.13. Instrument Approach Procedures – Initial/Intermediate

a) General This section provides guidance for instrument approach procedures up to and including the following (depending on the circumstance):

i) the last vector to final approach, but not including the turn onto the instrument approach procedure final track or the last track to the FAF;

ii) the last heading prior to turning on to the instrument approach procedure final track or the last track to the FAF (from a procedure turn, arc, feeder/transition, or part of a STAR);

This section is divided into subsections that discuss various actions and aircraft configurations for several types of arrival procedures. Where applicable, further distinction is made for different types of navigation equipment. It must be used with the section that deals with descent procedures.

b) Standard Calls General Other than as noted in this subsection and the next one that deals with altitude, no additional calls to those described in the "General" chapter are required during the Initial/Intermediate Approach phase. To reduce the likelihood of overshooting a desired track during any arrival procedure the PNF should warn the PF as follows:

i) When approaching a track which 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 "Track Bar is alive." The PF should confirm the movement and say "Check."

ii) 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^{o} away from the desired track. For example the PNF would call "10 degrees to 140", where 140^{o} is the desired track. The PF would confirm the bearing and call "Check."

iii) To reduce the likelihood of overshooting a desired vertical path during the Initial/Intermediate Approach phase, the PNF should warn the PF as follows:

a) 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."

c) Standard Calls – Altitude For the most part, the directions for altitude related calls that are described in the "General " chapter apply. However, some additional situations are likely to occur during the Initial/Intermediate Approach phase. Guidance follows:

(i) Unless the Captain determines that extenuating circumstances dictate otherwise, when approaching a target altitude, a warning that the aircraft is 100 ft away is not to be given. The purpose of this restriction is to minimize the possibility of missing a critical communication during this phase of flight. This direction applies only to altitudes outside of the FAF/FAWP or prior to the final approach track if no FAF/FAWP exists. The altitude warning requirements for final approach are discussed later in this chapter.

(ii) If ATC changes the target altitude before the aircraft reaches it, the crew should proceed as follows:

(A) The pilot who responds on the radio to an Air Traffic Control initiated altitude should make the applicable change to the Altitude Alert System. [Delete the next information if your aircraft is not appropriately equipped.] The pilot who responded on the radio shall also appropriately arm the Flight Guidance System. The pilot making the change shall then inform the other pilot; an example follows "New assigned altitude 5000, altitude select." The pilot making the change shall not do so if the Flight Guidance system is in the process of capturing an altitude. It is necessary to wait until capture is complete, then the new altitude is to be selected. The pilot other than the one making the selection shall acknowledge the change by stating "Check."

d) STARs and Profile Descent Procedures For STARs or Profile Descent Procedures ensure that ATC has specified a clearance limit or approach that terminates the procedure. This information is required in the event of a communication failure. If vectors are expected to transition to the approach see the subsection on ATC Vectors. If vectors are not expected (the STAR or Profile Descent terminates at the beginning of an approach) see the applicable subsection. The following are recommended for flying a STAR or Profile Descent.

[Insert the aircraft configuration that applies to your operation either as a requirement, a recommended profile, or an approximate configuration. If the profile is adequately described in the descent section then merely refer to it in this subsection. If STARs and Profile Descents require special procedures also detail them here. In developing them consider the following items:

- Aircraft speed;
- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting.]

i) [insert applicable configurations]

e) ATC Vectors Ensure that ATC has included a clearance limit or approach that the aircraft is being vectored to. This information is required in the event of a communication failure. If vectors are to other than final approach (an IAF/IAWP, IF/IWP, Fix/Facility for a procedure turn) refer to the applicable subsection and configure the aircraft appropriately. Once advised that the aircraft is being vectored for approach carry out the following:

[Insert the aircraft configuration that applies to your operation either as a requirement, a recommended profile, or an approximate configuration. If the profile is adequately described in the

descent section then merely refer to it in this subsection. If operations during vectors require special procedures also detail them here. In developing them consider the following items:

- Aircraft speed;
- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting.]

i) Carry out the In-Range Check at [insert the approximate point, distance from landing, or time from landing that the In-Range Check should be done.]

ii) During vectors, carry out the actions required so that the aircraft is appropriately configured when it turns on to final approach. Configure the aircraft as follows:

iii) [insert applicable configurations]

f) Holding Patterns, Procedure Turns, Shuttles The following applies for flying a Procedure Turn as part of an Instrument Approach. Holding Patterns and Shuttles when part of appro&aches can, for the most part, be treated a in manner similar to Procedure Turns. Additional guidance is available in a previous section that deals specifically with holds and shuttles.

[Insert the aircraft configuration that applies to your operation either as a requirement, a recommended profile, or an approximate configuration. If the profile is adequately described in the descent section then merely refer to it in this subsection. In developing procedures for procedure turns consider the following items:

- Aircraft speed;
- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting;
- Timing procedures, including which crew member(s) should carry out timing.]

i) Complete the In-Range Check prior to beginning the Procedure Turn.

ii) When timing is used for navigation during a procedure turn, use any other equipment available (DME, RNAV/FMS/GPS) to assist in determination of aircraft position.

iii) During the Procedure Turn carry out the actions required so that the aircraft is appropriately configured when it turns on to final approach. Configure the aircraft as follows:

a) [insert applicable configurations]

g) Non-RNAV Initial/Intermediate Approach Procedures other than Procedure Turns This subsection deals with Initial/Intermediate Approach Procedures that are not RNAV based, where a Procedure Turn will not be flown (whether a Procedure Turn is published or not). Further, this discussion is for pilot navigated procedures as opposed to ATC vectored procedures. The following guidance applies:

[Insert the aircraft configuration that applies to your operation either as a requirement a recommended profile or an approximate configuration. If the profile is adequately described in the descent section then merely refer to it in this subsection. In developing procedures for Non-RNAV Initial/Intermediate Approaches without procedure turns or vectors, consider the following items:

- Aircraft speed;
- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting;
- Timing procedures (if applicable), including which crew member is to carry out timing.]

i) Complete the In-Range Check before crossing the first fix that is part of the Instrument Approach Procedure. This may be either the IAF or the IF.

ii) When timing is used for navigation during the procedure, use any other equipment available (DME, RNAV/FMS/GPS) to assist in determination of aircraft position.

iii) During the Initial/Intermediate Approach carry out the actions required so that the aircraft is appropriately configured when it turns on to final approach. Configure the aircraft as follows.

a) [insert applicable configurations]

h) RNAV Non-GPS Initial/Intermediate Approach Procedures [TO BE ADDED LATER]

i) GPS Initial/Intermediate Approach Procedures [TO BE ADDED LATER]

5.14. Instrument Approach Procedures Intermediate/Final

[The information in this section applies to aircraft which are routinely flown from either the pilot or co-pilot seat with the pilot that flies the approach as the same one who carries out the landing. If your operation uses a different procedure (ie. co-pilot flown/pilot monitored approach with the pilot landing the aircraft) then some modification to this section will be required.]

a) General This section on Instrument Approach Procedures Intermediate/Final, applies to the portion from the turn onto the Final Approach Track or the turn on to the last track to the FAF, until one of the following:

i) the aircraft commences manoeuvring visually for a straight-in landing;

ii) the aircraft commences circling; or

iii) the aircraft commences a missed approach.

b) Common Procedures Flight Guidance and Altitude Alert The use of the Flight Director and Autopilot are recommended to reduce workload during approaches in busy terminal areas and during poor weather. The Altitude Alert is to be used to the extent practical to reduce the possibility of occupying an inappropriate altitude during the approach. When no longer required to steer the aircraft, the heading reminders/bugs should be set to the first heading to be used in the event of a missed approach. When no longer used during the approach, the Altitude Alert should be set to the first altitude that the aircraft is to be levelled at in the event of a missed approach.

c) Standard Calls – General During the Intermediate/Final Approach phase some additional calls are required to those described in the "General" chapter. These additional calls are described in this subsection and the next one that deals with altitude.

i) 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 "Track Bar is alive." The PF should confirm the movement and say "Check."

ii) 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^{o} away from the desired track. For example the PNF would call "10 degrees to 140", where 140^{o} is the desired track. The PF would confirm the bearing and call "Check."

iii) To reduce the likelihood of overshooting a desired vertical path during the Intermediate/Final Approach phase, the PNF should warn 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."

(iii) 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."

d) Standard Calls – Altitude, Required Visual Reference, DH, MDA, Go Around For the most part, the directions for altitude related calls that are described in the "General " chapter apply. However, some additional calls are needed during the Intermediate/Final Approach phase. The intention of these calls is to reduce the possibility of missing a critical altitude during descent in the final approach. Except where noted, the following guidance applies to all final approaches. Additional guidance that is specific to Category II and III ILS operations is provided in the subsection dedicated to those procedures. Note that all altitudes in this subsection are barometric. Radio Altitudes are only discussed in the subsection on Category II and III operations. It should also be noted that the additional altitude calls described in this subsection do pose a hazard in that some important communication may be missed as a result of them. However, the calls are to be made, as the hazard of missing an altitude during final approach is considered more important. The calls pertaining to Required Visual Reference Go Around are found at the subsections that discuss calls at MDA and DH, as well as individual subsections dedicated to them.

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

f) 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.

i) Minimum Altitude at a Step-down Fix;

ii) Minimum Altitude at a Facility;

iii) Minimum Descent Altitude (MDA) for a Non-Precision Approach;

iv) Decision Height (DH) for a precision approach.

v) Upon descending to within 100 feet of the above-listed altitudes the PNF should call "100 Above." The PF should respond by saying "Check." 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.

g) 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 "Levelling" and shall ensure that the aircraft remains in level flight until further descent is appropriate. As with the 100 feet above calls, if the aircraft flies beyond the Step-down fix or facility before reaching the altitude associated with it, no call should be made.

h) Required Visual Reference – General Once the PNF assesses that Required Visual Reference is available, the PF should be advised using the standard call "Visual at xx o'clock." The PF should then respond as follows:

i) "Check, continuing" If intending to continue flying the instrument approach procedure as published, the PF should respond "Check, continuing." The flight crew should carry out all remaining actions for the approach. These would include the PNF again making a visual call at the DH or at the MDA and appropriate distance.

ii) "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."

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

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

i) If the required visual reference is available the PNF should call "Minima, 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). The crew should then carry out the procedures described in the Landing or Missed Approach areas of this chapter.

ii) If the required visual reference is not available the PNF should call "Minima, No Contact." The PF should respond with "Go Around". The crew should then carry out the procedures described in the Missed Approach area of this chapter.

Note that for Instrument Approach Procedures using a glide path but which terminate in a circling manoeuvre, the Standard Calls and Responses for Minimum Descent Altitude and Circling are to be used. An exception is that if required visual reference is not available when the aircraft descends on the glide path to the MDA, the MDA may be maintained to the Missed Approach Point.

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

i) If the required visual reference is available the PNF should call "Minima, visual xx o'clock." The PF should respond with "Landing", "Commencing Circling", "Go Around", or "Check, continuing", depending on the situation (see the paragraph on Required Visual Reference in this section). The crew should then carry out the procedures described in the Landing or Missed Approach areas of this chapter. If the PF calls "Check, continuing", the PNF should then again call "Visual xx o'clock, at approximately the published visibility from the missed approach point. The PF should then respond with either "Landing" or "Go Around."

ii) 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. Should required visual reference become available prior to the missed approach point, the PNF should call visual xx o'clock." The PF should respond with "Landing", "Commencing Circling", or "Go Around", depending on the situation (see the paragraph on Required Visual Reference in this section). The crew should then carry out the procedures described in the Landing or Missed Approach areas of this chapter.

k) Non-Precision Approach – Missed Approach Point/Missed Approach Waypoint Upon arrival at the Missed Approach Point or the Missed Approach Waypoint the following calls shall be made depending on the circumstance:

i) 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). The crew should then carry out the procedures described in the Landing or Missed Approach areas of this chapter.

ii) If the required visual reference is not available the PNF should call "Missed Approach Point, No Contact." The PF should respond with "Go Around". The crew should then carry out the procedures described in the Missed Approach area of this chapter.

l) Standard Calls – Deviations For the most part, the directions for calls related deviations that are described in the "General " chapter apply. However, some additional calls are needed during the Intermediate/Final Approach phase.

[The paragraphs 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. Also, if your aircraft is equipped with an automatic warning system that alerts when a deviation occurs, make the deviation calls congruent with the automatic alerts.]

m) Glide Path, Front Course Localizer The provisions of this paragraph 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. 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". The crew should then carry out the procedures described in the Missed Approach area of this chapter.

n) Back Course Localizer The provisions of this paragraph 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. 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. If the PF calls "Go Around", the crew should then carry out the procedures described in the Missed Approach area of this chapter.

o) Track Deviations 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 centreline if tracking manually or continue monitoring the autopilot if in autoflight. 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. If the bearing indicator is the primary display and it shows that the aircraft has deviated from the desired track by 10° the PNF should advise the PF using the standard call "Track." The PF should respond "Check" and correct the aircraft toward the track centreline. If the bearing indicator shows that the aircraft has deviated from the desired track by 20° 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. If the PF calls "Go Around" the crew should then carry out the procedures described in the Missed Approach area of this chapter.

[The term "Stabilized Approach" will mean different things for different aircraft.]

p) Stabilized Approach Final approach can be a very high workload period of flight. It is also potentially one of the most hazardous phases of flight. A Stabilized Approach is intended to decrease workload, minimize crew distraction, and reduce the hazards associated with configuration changes at a critical phase of flight; generally it improves the likelihood of a successful approach. The Stabilized Approach configuration should be achieved no later than crossing the FAF/FAWP, or if there is no FAF immediately upon interception of the final approach track. Unless a stabilized approach is achieved crossing the FAF/FAWP or if there is no FAF while descending on the Final Approach Track, consideration should be given to executing a missed approach. Similarly, if one or more components of a previously stabilized approach is exceeded, consideration should be given to commencing a missed approach. A Stabilized Approach configuration is defined as follows (see "Standard Calls Deviations" in this chapter and "Standard Calls General" in the General chapter).

i) Established on the localizer/inbound track with no deviations (+/– one dot, +/– 10° of desired track).

ii) Established on the glide path (if applicable) with no deviations (+/– one dot) or no more than 300 feet above the FAF/FAWP Minimum Altitude.

iii) No Abnormal Airspeed (within –5 KIAS and +15 KIAS of V_{app}).

iv) No Abnormal Rate of Descent (maximum descent rate of 1,000 FPM unless higher rate has been briefed). Note that for some approaches with very steep descent gradients on final approach, a rate of more than 1,000 FPM down may be required. If so, the requirement shall be briefed to all crew members.

NORMAL PROCEDURES

[Insert the aircraft configuration(s) that apply your operation. Specify either as a requirement, a recommended profile, or an approximate configuration. In developing procedures for Intermediate/Final Approaches, consider the following items:

- Aircraft speed;
- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting;
- Timing procedures (if applicable), including which crew member(s) are to carry out timing;
- NAVAID display;
- Autopilot usage;
- Flight Director usage.]

q) NDB Approach with FAF [See configuration recommendations above.]

r) NDB Approach without FAF [See configuration recommendations above.]

s) VOR or VOR/DME Approach with FAF [See configuration recommendations above.]

t) VOR or VOR/DME Approach without FAF [See configuration recommendations above.]

u) RNAV Approach [If RNAV approaches (other than stand alone GPS) are done in your operation, insert the relevant procedures and crew coordination in this subsection. See configuration recommendations above.]

v) GPS Non-precision Approach [See configuration recommendations above.]

w) ASR Approach [If ASR approaches are done frequently in your operation, insert the relevant procedures and crew coordination in this subsection. See configuration recommendations above.]

x) ILS Category I Approach [See configuration recommendations above.]

y) ILS Category II and III Approach [If your operation is approved for ILS Category II or III Approaches, insert the relevant procedures and crew coordination in this subsection. See configuration recommendations above.]

z) MLS Approach [If your operation is approved for MLS Approaches, insert the relevant procedures and crew coordination in this subsection. See configuration recommendations above.]

aa) PAR Approach [If PAR approaches are done frequently in your operation, insert the relevant procedures and crew coordination in this subsection. See configuration recommendations above.]

5.15. Circling Procedures

[The discussion in this section pertains to operators that are approved for circling at less than 1000 and 3. If your operation is not so approved, recommend that you refer to the section on VFR Circuits for procedures.]

[During circling it is mandatory that the aerodrome remain in view of at least one of the pilots. The pilot who is maintaining visual contact is tasked primarily with keeping the aerodrome in sight. The other pilot is tasked with constant monitoring of aircraft altitude, speed, and bank angle. Whatever procedure your organization uses to carry out a circling manoeuvre, the above principles must apply. The procedure described in this section assumes that the pilot who flew the approach will remain in control of the aircraft throughout the circling procedure all the way to landing. In our example, if it is necessary to circle with the aerodrome on the opposite side of the aircraft from PF, the PNF would provide heading and turn guidance to manoeuvre the aircraft into a position for the PF to visually acquire the area of intended landing. We chose this procedure because it permits us to illustrate some manoeuvres that may apply to a broad variety of procedures. We neither endorse nor disapprove of such a procedure. It is merely an example. You must develop procedures that meet the requirements of your operation.]

a) General The information in this section provides guidance for circling from an Instrument Approach. Circling may be required whenever no straight-in minima are published, when the approach flown does not serve the runway of intended landing, or when a reconnaissance of the runway is advisable. Effective crew coordination is vital to safe and effective circling. This section provides guidance for crew coordination as well as configuration of the aircraft. This section must be used with the section on Landing Procedures that is found later in this chapter. Basic information on circling is found in the AIP and the Instrument Procedures Manual. The following points apply to all circling procedures:

i) Visual contact with the aerodrome shall be maintained by at least one of the pilots throughout the circling manoeuvre.

ii) If visual contact with the aerodrome is lost, a missed approach shall be executed.

iii) The aircraft should remain at the MDA until in a position to commence a normal descent for landing.

iv) No more than 30^{o} of bank is to be used during the circling manoeuvre.

b) Aircraft Configuration The recommended configuration for circling until the aircraft commences the final descent for landing follows. For information on landing see the Landing Procedures section later in this chapter.

[Insert the aircraft configuration(s) that apply your operation. Specify either as a requirement, a recommended profile, or an approximate configuration. In developing procedures for Intermediate/Final Approaches, consider the following items:

- Aircraft speed;
- Circling Category (based on the maximum speed used during the final, circling, and initial part of the missed approach);
- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting;
- NAVAID display;
- Autopilot usage;
- Flight Director usage.]

c) Crew Coordination This subsection on Crew Coordination is further divided into areas dealing with procedures that are common to all circling, circling with the aerodrome on the PF side of the aircraft, and circling with the aerodrome on the PNF side of the aerodrome.

d) Common Procedures The pilot who flies the instrument portion of the approach should retain control of the aircraft during circling through to landing. As detailed in the section of this chapter dealing with Standard Calls for MDA, the PF calls "Commencing Circling" in response to the PNF's call of "Visual xx o'clock." Once the aircraft has been manoeuvred into a position for a normal landing the PF shall call "Landing" and continue as described in the section "Landing Procedures" found later in this chapter. If reconnaissance of the runway is one of the objectives of the circling manoeuvre, the pilot observing the runway should advise the other pilot of the relevant information using the following format:

i) Wind;

ii) Obstructions on the runway;

iii) Runway surface condition; and

iv) Remarks.

e) Aerodrome on PF side While manoeuvring the aircraft for landing, the PF shall maintain visual contact with the aerodrome. The PNF will primarily monitor the aircraft

instruments and immediately advise the PF of abnormal altitude, bank, or speed. The standard calls for abnormal conditions described in the General chapter are to be used.

f) Aerodrome on PNF side While the PF is manoeuvring the aircraft and is able to maintain visual contact with the aerodrome, the PNF shall monitor the aircraft instruments and immediately advise the PF of abnormal altitude, bank, or speed. Prior to losing visual contact with the aerodrome, the PF will request heading and turn directions from the PNF using the standard call "Request Steer." The PNF will respond "Check." The PNF will then direct the PF to position the aircraft such that the PNF will remain in visual contact until the aircraft is manoeuvred to a point where the PF can continue to fly the aircraft visually to landing. Once the aircraft has manoeuvred to a position that the PNF assesses that the PF can continue visually, the PF should be advised using the standard call "Visual xx o'clock." The PF should confirm that a landing is advisable, then call "Landing", to which the PNF will respond "Check." The standard calls for steering the aircraft follow:

i) When a turn to a specific heading is required the PNF should call "Turn Left (or Right) to heading xxx." The PF should respond "Turning Left (or Right) to xxx" and begin to turn the aircraft to the assigned heading. Unless specified by the PNF the turn should be carried out at rate one to a maximum of 30^{o} of bank.

ii) When a specific heading is not easily determined, the PNF may direct the commencement and termination of a turn. To begin a turn the PNF should call "Turn Right (or Left) Now." The PF should respond "Turning Right (or Left)" and roll into a rate one turn to a maximum bank angle 30^{o} unless another bank angle is directed. To end a turn the PNF should call "Roll out, Now." The PF should respond "Rolling Out", and level the aircraft.

5.16. Contact/Visual Approach Procedures, VFR Circuits

a) General The purpose of carrying out a Contact Approach, a Visual Approach, or a VFR Circuit, is to position and configure the aircraft to carry out a safe landing. The AIP and the CARs provide a good deal of information on these procedures which will not be repeated here. This section does however, provide guidance on aircraft configuration, checks, and navigation.

b) Aircraft Configuration and Checks For guidance on aircraft configuration and completion of checks, Contact Approaches, Visual Approaches and VFR Circuits are treated as variations of the same type of procedure.

[Insert the aircraft configuration(s) that apply to your operation. Specify either as a requirement, a recommended profile, or an approximate configuration. In developing procedures for Intermediate/Final Approaches, consider the following items:

- Aircraft speed;

- Engine and/or propeller settings;
- Landing Gear position;
- Flap setting;
- Icing considerations;
- Speed brake or spoiler setting;
- NAVAID display;
- Autopilot usage;
- Flight Director usage;
- Recommended locations for completion of checks (In-Range, Before Landing, Final Landing.]

c) Navigation Navigation during visual procedures is by definition primarily by visual means. However, there is often an advantage to use other available NAVAIDS.

[Insert guidance on set up and use of NAVAIDS as applicable to your operation. The guidance may be quite rudimentary for Visual Approaches and VFR Circuits, or more detailed for Contact Approaches.]

5.17. Missed Approach

[In this section we have used "Go Around" as the standard call to initiate a missed approach. "Go Around" is used because it applies to the mode of display and operation of several flight guidance systems associated with missed approach procedures. Use of other terms such as "Overshoot" or "Missed Approach" are completely acceptable. However, we do recommend the use of terminology that is consistent with equipment in your aircraft.]

[To the extent practical specify missed approach procedures that are common for all or most types of missed approaches. Also, attempt to make most elements of the missed approach similar to those for a take-off.]

a) General During some approaches it will become inadvisable to continue for landing. Should this occur, a missed approach should be initiated. Guidance for specific conditions when a missed approach should be initiated is detailed throughout these SOPs. Such guidance cannot address all circumstances. Accordingly, either pilot should initiate a missed approach whenever a landing becomes inadvisable.

b) Common Procedures The procedures to execute missed approaches from most situations are comprised of common elements. Although some requirements will differ, such as navigation, the basic procedure is standard for all missed approaches. In all cases a missed approach is initiated by one of the pilots using the standard call "Go Around" which is immediately responded to by the other pilot with "Check." If Full Flap has been selected, the standard call is modified to "Go Around, Flaps Approach." The PNF would respond similarly with "Check" and selecting the flaps from full to Approach.

The remaining procedures and crew coordination for a missed approach are described in the following table.

[The following checklist is a guide only and cannot apply to all aircraft. The checklist particular to the aircraft must be inserted here]

Table 5-2 Missed Approach – Procedure and Crew Coordination

PF	PNF
Select Go Around on the Flight Director. – Call "Go Around", or if appropriate call "Go Around, Flaps Approach."	– Acknowledge with "Check" and if appropriate confirm that the minimum speed is V_{fri} and select flaps to approach.
Rotate the aircraft at a rate of about 2^{o} per second until the pitch attitude approximately matches the Flight Director command cue. Simultaneously advance the power levers toward the power setting briefed for the missed approach. If a power setting other than as briefed is appropriate, call for the required power.	Tap the PF's hand from below and simultaneously advance the power levers and propellers to the setting briefed for the missed approach or to the power setting called for by the PF.
When the PNF taps the PF's hand from below the PF should place both hands on the control yoke to indicate understanding that engine power is being handled by the PNF.	Confirm that the aircraft is climbing as indicated by the altimeter, the VSI and, if possible visually. If the aircraft is in fact climbing: – Call "Positive Rate."
At the "Positive Rate" call, confirm a climb on the VSI and visually (if possible). If climbing: – Call "Gear Up" and give the visual signal to retract the landing gear.	Select the landing gear up. Select Heading as the lateral mode on the Flight Director and select Altitude Select to arm the Flight Director altitude capture mode. Confirm the Flight Director selections on the advisory display and, if successful say nothing. If not successful briefly indicate the fault. Monitor gear retraction. If gear retraction is normal say nothing. If there is a malfunction call "Unsafe Gear".
If the PNF advises that a landing gear malfunction has occurred do not exceed ____ KIAS. Retract flaps on schedule, climb to at least 1000 ft AGL and refer to the appropriate abnormal procedure check.	
Climb at a speed of at least V_2 + 10 KIAS (if all engines are operating normally). At a safe altitude that is at least 400 ft above	Confirm that the aircraft speed is at least V_{fri} then select the flaps up, select IAS as the vertical mode of the Flight Director:

PF	PNF
the departure runway accelerate to V_{fri} then: – Call "Flaps Up", and give the visual signal to retract the flaps.	– Call "IAS Selected".
Call for any changes to NAVAID set up.	Action any NAVAID changes.
Adjust the IAS using TCS or call for the PNF to set a particular speed using the thumb wheel. Do not exceed _____ KIAS until the Gear Up, Flaps Up call.	When flaps have fully retracted re-confirm that the gear is up: – Call "Gear Up, Flaps Up".
When the PNF calls "Gear Up, Flaps Up", if Take-off Power is no longer required: – Call "Set Climb Power" and give the visual signal to reduce to climb power. (If other than standard power is required at this point call for the specific power required, ie. "Set Max Continuous Power.")	Select the bleeds to ON and MAX. Then reduce to climb power or as directed and select the synchrophase on.
Follow the published/cleared/circuit missed approach. Climb to the missed approach altitude or circuit/cleared altitude: – Call "After Take-off Check" or the "Downwind Check" if applicable.	Carry out either the "After Take-off Check" as detailed in the Normal Flight Procedures Departure chapter, or the "Downwind Check" as detailed in the Normal Flight Procedures Arrival chapter.

[If your aircraft or operation can make use of additional guidance for missed approaches under specific circumstances (ie. Category II ILS) detail them as separate procedures/tables or as text in the form of differences from common procedures.]

5.18. Landing Procedures

[The minimum information required in this section is that which will allow the crew to be coordinated in their actions throughout the landing procedure. Depending on your operation, you may wish to elaborate on landing techniques in addition to crew coordination. If your aircraft/operation uses more than one landing procedure with substantial differences, use additional tables of coordination instructions as required. If only small differences exist for various flap configurations or crosswind conditions, it may be better to simply discuss the variations as text. If a Flapless Landing or a landing with a particular flap setting is an abnormal or emergency procedure, such a discussion is best dealt with in the Abnormal and Emergency Procedures chapter.]

EMERGENCY PROCEDURES - EXPANDED

[An example of guidance for landing technique for a fictitious aircraft is included in this section. The aircraft can be landed from either seat and has limited nose wheel steering from both seats. Ground steering is only available from the pilot seat.]

This section on Landing Procedures provides guidance for flight from the completion of the Final Landing Check through landing until the aircraft has slowed to taxi speed. The following table contains guidance on landing procedure and crew coordination for a normal landing.

[The following checklist is a guide only and cannot apply to all aircraft. The checklist particular to the aircraft must be inserted here]

Table 5-3 **Normal Landing – Procedure and Crew Coordination**

PF	PNF
Adjust the final approach glide path to as close to 3^{o} as is practical under the conditions. At between 200 and 100 ft above touchdown reduce airspeed from V_{app} to cross 50 ft above the threshold at V_{ref}. Change the correction for crosswind from crab to wing down/opposite rudder by 50 ft above the threshold.	Monitor the flight path and use standard calls if required to alert the PF to an airspeed that is below V_{ref} or to an abnormal descent rate.
	Upon first contact of the first main wheel select the Propellers to MAX.
As soon as both main wheels are on the runway, smoothly but quickly lower the nose wheel to the runway. Maintain slight forward pressure on the control yoke and increase into wind roll control until the controls are locked.	
As soon as the nose wheel is on the runway, select the power levers to disc. Confirm that both ground range lights illuminate. If the ground range lights illuminate, reverse may be used until the aircraft is almost at a stop or until blown dust or snow moves forward to the leading edge of the wing, whichever occurs first. Brakes should be used as required.	For a co-pilot flown landing place left hand on the tiller in preparation for taxi or if required to assist during the landing roll.
For a pilot seat flown landing, at maximum of ___ KIAS: – Announce "Your wheel", and begin taxiing by steering with the tiller. For a co-pilot seat flown landing, at maximum of ___ KIAS but no later than taxi	For a pilot seat flown landing: – Reply "My wheel" and lock the controls. For a co-pilot seat landing upon hearing

PF	PNF
speed, lock the controls: – Announce "You have control"	"You have control": – Reply "I have control" and take over taxiing by steering with the tiller.

5.19. After Landing Procedures, After Landing Check

The After Landing Check should be carried out once the aircraft has taxied clear of the active runway. In conditions of light aerodrome traffic and/or if a long taxi on the active runway is required before exiting to a taxiway, the After Landing Check may be done on the runway. Taxi procedures are discussed in the Normal Flight Procedures Departure chapter. The expanded After Landing Check follows.

AFTER LANDING CHECK (PNF)

Controls	**Locked**
Flaps	**Up**
Landing Lights	**Off**

If there is a significant hazard of collision, it may be advisable to leave the landing lights on until clear of the active runway.

A/COL Lights **Red**

Select Anti-Collision strobe lights to red to reduce glare for other aircraft.

Ignition **NORMAL**

The ignition should to normal unless required for taxiing in slush.

After Landing Check **Complete**

Taxiing Without All Engines Operating [If Applicable]

[Insert applicable information in the following sub-section only if your aircraft is permitted to taxi without all engines operating.]

Taxiing the [Aircraft Type] aircraft without all engines operating is approved. However, the following limitations and procedures apply:

The Shutdown Check is to be carried out to secure an engine during taxi.

Taxiing in congested areas is not permitted.

Taxiing in reverse is not permitted.

Normal and stand-by hydraulic power must be available to operate brakes.

Nose wheel steering must be operating.

5.20. Shutdown Procedures, Shutdown Check

Once the aircraft has been taxied to the parking position and stopped, the Shutdown Check should be used to secure the engines and prepare the aircraft for unloading. If the aircraft will not be de-powered, (as for a station stop) not all items will be carried out. The Shutdown Check is also to be used to shutdown an engine during taxi. The expanded Shutdown Checklist follows.

[The following checklist is a guide only and cannot apply to all aircraft. The checklist particular to the aircraft must be inserted here]

SHUTDOWN CHECK (Challenge and Response)

EMERGENCY BRAKES	**PARK**
External Power	***a/r***

External power should be connected for a station stop and cabin lighting should be operated if disembarking passengers at night.

FMS	***a/r***

The FMS would only be shutdown if the aircraft is to be de-powered, or if it is necessary to re-initialize it. For a station stop it may be left initialized provided external power is available.

Power Levers	**Flight Idle**
Condition Levers	**Start & Feather**
STBY HYD Switches	(Co-pilot) **NORM**
Condition Levers	(after 30 sec) **Fuel Off**

A period of 30 sec is required between selection of start feather and fuel off to permit proper oil migration in the engine.

Shutdown Check	**Complete**

Annex A to Chapter 5

NORMAL FLIGHT PROCEDURES - ARRIVAL, ABBREVIATED CHECKLISTS

[The following is an example only. Insert procedures that are used in your operation that are applicable to your aircraft as per the Aircraft Flight Manual.]

Introduction

The abbreviated form of the Arrival checklists follows.

DESCENT CHECK (Challenge and Response)

Pressurization	(PNF) **Set**
Landing Data	(PNF) **Computed & placarded**
Approach Briefing	(PF) **Complete**
Passenger Briefing	(PNF) **Complete**
Descent Check	(PNF) **Complete**

IN-RANGE CHECK (PNF)

Ignition	**a/r**
FASTEN BELTS Lights	**ON**
Harnesses	(PF/PNF/FA/Cabin) **Secure**
Altimeters	(PF/PNF) **Set**
In-Range Check	**Complete**

DOWNWIND CHECK (PNF)

Autofeather	**Off**
Bleeds	**ON**
Approach Briefing	(PF) **Complete**
Downwind Check	**Complete**

NORMAL PROCEDURES

BEFORE LANDING CHECK (PNF)

Landing Gear Lever	**Selected Down**
Synchrophase	(Co-pilot) **OFF**
Propellers	___% or Max
Flaps	**Selected to Approach or Up**
Warning/Caution Panel	**Checked**
Landing Gear	**Down**
Flaps	**Approach Set**
Before Landing Check	**Complete**

FINAL LANDING CHECK (PNF)

Bleeds	**OFF**
Flaps	**Selected to Approach/Land/Up**
Flaps	**Approach/Land Set or Up**
Final Landing Check	**Complete**

AFTER LANDING CHECK (PNF)

Controls	**Locked**
Flaps	**Up**
Landing Lights	**Off**
A/COL Lights	**Red**
Ignition	**NORMAL**
After Landing Check	**Complete**

SHUTDOWN CHECK (Challenge and Response)

Emergency Brakes	**PARK**
External Power	**a/r**
FMS	**a/r**
Power Levers	**Flight Idle**
Condition Levers	**Start & Feather**
STBY HYD Switches	(Co-pilot) **NORM**
Condition Levers	(after ___ sec) **Fuel Off**
Shutdown Check	**Complete**

Chapter 6. After Flight

6.1. Introduction

a) For the purpose of these SOPs, "After Flight" is from, but not including, the shut down of the last engine at the completion of a flight and includes most after flight activities. It does include starting and stopping of an engine to reposition the aircraft at the completion of flight.

b) For multiple flights, portions of this chapter and the chapter pertaining to "Pre-Flight" shall apply.

6.2. Apron Safety and Embarking/Disembarking Passengers

[Although some of the after flight requirements are dealt with in the Company Operations Manual, crew coordination is likely required, and therefore some information would be useful in the SOPs. The following deals only with crew coordination responsibilities. It may be advantageous to include specific details such as:

- safety procedures;
- securing of propellers.

For additional information refer to the CARs and related standards or contact your regional office.]

Unless otherwise arranged, the Captain shall escort passengers on the apron to and from the aircraft. Additional information can be found at the section with the same title in the Before Flight chapter.

6.3. Fuelling With Passengers Onboard, Embarking or Disembarking

Information on fuelling with passengers on board may be found in the section with the same title in the Before Flight chapter.

6.4. Repositioning using Aircraft Engines

The requirements for repositioning using aircraft engines are described in the section with the same title in the Before Flight chapter.

6.5. Auxiliary Power Unit

[If your aircraft is not equipped with an auxiliary power unit delete this section.]

The procedures for use of the Auxiliary Power Unit after flight are essentially the same as those for before flight. Refer to the Before Flight chapter for procedures.

6.6. Servicing

Unless otherwise arranged the FO is responsible for the following servicing tasks. Should one or more of these tasks be carried out by another party (ie. fuelling carried out by a Fixed Base Operator) the FO is still responsible for ensuring that the task was completed correctly.

a) Checking and replenishment of engine oil;

b) Checking and replenishment of hydraulic fluid;

c) Checking and replenishment of fuel;

d) Checking and replenishment of anti-icing/de-icing fluid.

6.7. Elementary Work

Some elementary work is routinely carried out in support of normal operations. The crew responsibilities pertaining to such work follow. Additional guidance on the following work and other elementary work will be provided during the applicable training.

a) Passenger Seats Installation and/or Removal The Captain is responsible for correct completion of any work done for installation or removal of passenger seats.

6.8. After Flight Duties

a) Arrival Reports The Captain is to make any required arrival reports. This duty should not be delegated except that the FO may make arrival reports by radio under the Captain's supervision.

b) Aircraft Security When the aircraft is not to be flown for a significant period (such as at the end of a work day), particularly if it will be unattended, it is to be secured. The FO is responsible for its security. If available, the Captain is expected to assist in securing the aircraft. However, security remains the responsibility of the FO unless other arrangements are made. The securing of the aircraft includes, but is not limited to, the following:

i) installation of pitot and static vent covers;

ii) installation of stall warning sensor guards;

iii) installation of intake covers;

iv) installation of landing gear and gear door safety pins;

v) installation of wheel chocks;

vi) locking of aircraft doors and hatches;

vii) grounding the aircraft;

viii) tying down the aircraft (if required);

ix) installation of wing, and stabilizer covers.

EMERGENCY PROCEDURES - EXPANDED

Chapter 7. Abnormal And Emergency Procedures

7.1. Introduction

a) General The contents of this chapter pertain to the operations during abnormal and emergency situations. It is impossible to develop guidance and procedures to deal with all situations. The judgement, skill, and training of all persons involved are necessary to bring an abnormal or emergency situation to a safe conclusion. The guidance in this chapter is in the form of instructions, expanded checklists, detailed procedures, or a combination of all of these. Unless safety is jeopardized they shall be applied in the handling of Abnormal and Emergency situations.

b) Publications These SOPs have been developed to provide as much guidance as practical for handling Abnormal and Emergency situations. Obviously, it is not possible to deal with all situations. Accordingly, it may be appropriate to refer to other publications such as:

i) [Aircraft Manufacturer] [Aircraft Type] approved Aircraft Flight Manual (AFM) (additional guidance on the relationship of the SOPs and the AFM can be found in the General chapter);

ii) [Operator's Company Name] Operations Manual;

iii) Canada Air Pilot (CAP);

iv) Aeronautical Information Publication (AIP) Canada;

v) Canada Flight Supplement.

7.2. General

a) Objectives Obviously, the primary objective in dealing with an Abnormal or Emergency situation is to complete the operation safely. To achieve this primary objective other goals need to be pursued and tenets observed, depending on the situation. The following is a partial list. Depending on the circumstance others may need to be developed to meet the needs imposed by the situation.

i) The abnormality or emergency should be mitigated such that aircraft operation is returned to as close to normal as possible.

ii) Although it is usually desirable to complete abnormal and emergency procedures quickly, it is more important that they be done correctly.

iii) The safety of passengers and persons on the ground is the first priority. The safety of the crew is the second priority. The third priority is the protection of property and the aircraft.

b) Aural and Visual Indications An aural alarm should be silenced as soon as the situation that the alarm applies to is clearly recognized. Visual caution and warning indications should be cancelled and re-armed as soon as practical after they are triggered. The condition that caused the indication should be determined before further action.

c) Automatic Protection Devices and Systems Reset of a service that has been disabled by an automatic protection device or system is subject to the limitations in the following paragraphs:

i) If a failed system is required for the completion of the flight, an attempt may be made to return it to service. If it is not required, the system should remain out of service.

ii) Unless otherwise indicated in the SOPs, checklists, or AFM, a circuit breaker that has opened should be reset a maximum of once to attempt to return a needed item to service. If the circuit breaker opens a second time no attempt should be made to reset it.

iii) A generator that has tripped may only be reset once unless otherwise specified in the SOPs, checklist, or AFM.

d) Crew Coordination – General The importance of the crew operating as a team to deal with an abnormal or emergency situation cannot be overstated. That the Captain is in command is not in question. This does not relieve all remaining crew members of the responsibility for fostering the effectiveness of the Captain and taking initiative when the situation warrants. The general sequence for handling an abnormal or emergency situation is described in the following paragraphs.

i) The first crew member (any crew member – not just the pilots) who notices an abnormal or emergency condition should make the applicable call either identifying the condition or initiating the appropriate immediate action.

ii) The PF or Captain (if appropriate) should call for the applicable drill or check.

iii) The PNF should complete the drill and/or check.

iv) As soon as practical after the initial actions are taken to respond to an abnormal situation, all crew members and the passengers should be apprised of the situation and planned action.

e) Crew Coordination – External Communication During normal operations the PNF is tasked with timely routine communication to ATC and other agencies. During the handling of emergency or abnormal situations the PNF may be fully occupied with other duties. Therefore, during abnormal procedures the protocols described in the following paragraphs should be observed.

i) During the drill portion of an emergency procedure all crew members are to remain focused on the drill. External communication is to be delayed until the drill is complete.

ii) During the completion of the check portion of an emergency or abnormal procedure the PF should handle the external communication.

iii) Upon completion of the check, the PNF should once again assume responsibility for the handling of external communications.

iv) The procedure for transfer of responsibility for external communications is similar to that for transfer of aircraft control which is described in the general chapter. The standard terminology is "I have the radios" or "You have the radios."

f) Crew Coordination – Internal Communication During an abnormal or emergency situation effective internal communication is necessary for dealing with the situation, preventing it from becoming worse, and to reduce the unfavourable impact of events. The following areas of internal communications are relevant.

i) Flight Crew Members During an abnormal or emergency situation the goal of effective communication is often difficult to achieve. The person who has important information to transmit must use judgement as to the timeliness and method of transmission. Nevertheless, it is the responsibility of the transmitter to ensure that information is received and understood! The transmitter may need to make several attempts to gain understanding. It may be difficult to determine that the recipient has understood – questioning of the recipient may be required. It may be necessary to observe that the recipient takes appropriate action before the transmitter can be sure that information has been passed. If repeated attempts to communicate have failed, the person involved may have become incapacitated – see the applicable section later in this chapter. Although this may seem very basic, far too many aircraft have been lost due to failed communication.

[Delete this section if your operation does not make use of crew members other than Flight Crew.]

ii) Crew Members The points that apply to flight crew also apply to other crew members. However, they must be even more careful in the timing of their communications with the flight crew. Crew members other than flight crew do however, require information to carry out their duties. The flight crew shall provide certain key information to other crew as soon as the initial actions for an emergency or abnormal situation are done. Due to high workload it may be necessary for crew members to actively extract from the flight crew the information that they require. The general information that the crew members will need to know is discussed in the section titled "Common Procedures, Emergency Landing."

[Additional information about communication with passengers during abnormal and emergency situations is available from the Passenger/Cabin Safety section of your regional office.]

iii) Passengers Passengers have a need and a right to know what is happening in an emergency situation. As soon as practical after the initial actions are taken to safeguard the flight, the passengers should be provided with an honest and accurate summary of the situation. [Modify the next sentence to suit your operation depending on whether or not you carry crew other than the pilots.] Although the initial situation briefing may be provided to the passengers by any crew member, at some point the Captain should speak to them personally. Guidance on information to be provided to passengers is found in the section titled "Common Procedures, Emergency Landing."

g) Crew Coordination – Confirmation of Vital Actions During an abnormal or emergency situation, the completion of most actions is delegated to various crew members with little or no monitoring by the remaining crew. This minimal monitoring is necessary to permit effective completion of tasks in the time available. However, correct completion of some actions is so vital that confirmation by another crew member is required. Generally, it is mandatory to confirm correct completion of any action which if done incorrectly would result in loss of engine power or aircraft control. Specific direction is provided throughout this chapter.

[The contents of the following subsection may need to be modified for your operation. Consider such factors as:
- location of controls and switches;
- availability of flight instrument displays;
- experience of flight crews.]

h) Crew Coordination – Aircraft Control Except where the malfunction of aircraft controls prevents it, the pilot who has control at the time of occurrence of an abnormal or emergency event, should retain control during the initial corrective actions. For some corrective action it may be appropriate for the Captain to pass control to the FO to more effectively manage an emergency. In many cases experience that a Captain

possesses may be better employed in overall management of an abnormal or emergency condition than in the manipulation of flight controls. Also, within the limitations described in the AFM, the autoflight system should be used to reduce crew workload.

7.3. Handling of Abnormal and Emergency Procedures

a) The guidance in the following excerpt from the [aircraft type] checklist applies to all abnormal and emergency procedures. Although *they are not verbalized during the handling of abnormal situations, these items shall be committed to memory and shall be done for all abnormal and emergency situations. The expanded contents of the checklist follow.

b) A thorough knowledge of procedures is required to deal with abnormal and emergency situations. It is impossible to provide guidance for all situations. Sound judgment must prevail. The following directions apply to all abnormal and emergency situations.

i) FLY THE AIRCRAFT It is of no consequence how quickly and correctly a drill or check is completed, if the aircraft departs controlled flight.

ii) Silence any aural warning. Cancel and re-arm any visual alert.

iii) Aural warnings should be reset to reduce distraction to the crew in handling the situation and to re-arm the system(s) in the event that further malfunctions occur.

iv) Identify the emergency or abnormal condition

v) It is vital that the situation be correctly identified so that the appropriate action is taken.

vi) Take the appropriate action

7.4. Checks, Checklists, and Drills

a) General The additional direction in the following paragraphs applies to the guidance that is provided in the General chapter.

i) The drills and checks that apply to some situations are included in the same checklist. The memory items that comprise the drill portion of the procedure are indicated by a medium bullet " " two spaces to the left of the item.

ii) Unlike normal procedures checks, there is no statement that a particular check is "complete" as the last item. This difference is required as some checks lead to other checks. It is up to the flight crew member who is doing the check to advise the other members when checks are commenced and when they are complete.

iii) Items that require confirmation by a second flight crew member are indicated by a capital letter "(C)" in parentheses, located between the bullet (if applicable) and the item.

[Briefly describe the organization of your Abnormal and Emergency Checklists. This information would probably be useful to your crews in finding the information that they need to deal with a problem. The following is an example only.]

b) Organization The Checklists for Abnormal and Emergency Procedures are grouped into the following sections. The discussion in these SOPs follows the same order as is used in the checklist.

i) Common Procedures Procedures that apply to all Abnormal and Emergency situations and includes general procedures for a landing after dealing with an emergency, other than a ditching or forced landing off of an aerodrome.

ii) Engine and Propeller.

iii) Fuel System.

iv) Hydraulics and Brakes.

v) Landing Gear.

vi) Electrical.

vii) Flight Controls. Includes flaps.

viii) Ice Protection Systems.

ix) Airframe and Fuselage. Includes pressurization, heating/cooling/ventilation, smoke and fire other than related to engines.

x) Off Aerodrome Landing. Includes: Ditching, Forced Landing.

xi) Ground Emergency Procedures. Includes: Aborted Take-off, Evacuation, Fire/Smoke on the Ground.

c) The following items do not have specific checklists. They are Abnormal and Emergency situations. The handling is discussed in the latter portion of this chapter, separate from the items that are in the checklists.

i) Abnormal Take-off

ii) Stall Recovery

iii) Pilot Incapacitation

iv) Bomb Threat and Hijacking

v) Post Evacuation Actions

vi) Wind Shear

7.5. Emergency Landing

The following is an excerpt from the checklist detailing the actions required for a landing subsequent to an airborne emergency. The items marked by medium bullets "●", the first letters of which form the acronym "TESTRA" are to be committed to memory

EMERGENCY LANDING

a) For a landing following an airborne emergency or for any landing when the situation presents a significant hazard, the following points should be addressed:

b) As soon as practical after the initial emergency actions, brief the FA or passengers. The amount of detail will vary depending on the time available. The briefing should be in the following format:

c) FAs are to expect that the following format is to be used by the pilots to provide critical information. During an emergency the pilots may become distracted. It may not be possible for the pilots to provide the following information as an unbroken stream. FAs must be judicious in soliciting information from the pilots. However, FAs shall obtain the following information – even if it is not in the following sequence or if it is necessary to query the pilots repeatedly.

● **T**ype of emergency. Briefly indicate what the emergency is, ie. Engine Failure, Hydraulic Malfunction, Cracked Window, etc. Obviously, more detail must be provided to crewmembers than to passengers.

● **E**vacuation information. Evacuation information should include: whether the landing will be on or off an aerodrome; the route and/or exits that are to be used to evacuate from the aircraft.

[To the extent practical you should standardize the signals to be used. It may not be possible to specify that one particular method is to be used. However, the number of chimes or flashes of a warning light should be standardized for various situations.]

- **S**ignals. Detail the method that will be used to signal bracing for landing/impact and the signal to commence evacuation. Depending on the situation, the signals could include: a call on the intercom, a series of chimes of the cabin public address system, a call on the public address system, activation of the emergency lights, or a combination.

- **T**ime remaining. Brief the time remaining to landing and, if different ,the time remaining to prepare. Depending on the nature of the emergency it may be necessary to cease preparations some time before landing (ie. controllability difficulties may necessitate that no one move about the aircraft during the latter part of descent).

- **R**elocation of passengers. Brief if it is necessary/advisable to relocate passengers, or if movement of passengers is not permitted (due to time or adverse affects on the balance of the aircraft).
as to the nature of the emergency, its effects, the flight time remaining and, (if required) the evacuation procedures.

- **A**nnouncements. If flight attendants are on board, detail who will brief the passengers. Ideally the FAs should provide the most detailed briefing to passengers. If no FA is on board the Captain should brief the passengers. The announcement should follow the same format as the briefing to the crew, ie. "TESTRA." The Captain's announcement should make it clear to the passengers that the crew is managing the situation and should reaffirm the authority of the flight attendant to manage the situation in the cabin.

— Advise ATC and any other relevant agencies of intentions and CFR requirements.

— Secure all loose objects on the flight deck and in the cabin.

— Ensure all crew and passenger seat belts and shoulder harnesses are secure and locked.

— Review the applicable post landing procedures with all crew members.

— If applicable: De-pressurize the aircraft and select the Emergency Lights to ON.

— If appropriate, plan for an Evacuation once the aircraft comes to a stop.

— Once the aircraft comes to a stop, specifically direct the passengers to remain seated and await instructions. Then, if appropriate, initiate the Evacuation drill.

7.6. Engine Failure/Fire – During Take-Off, After V_1

[Depending on the characteristics of your aircraft, it may be appropriate to combine the procedures and drills/checks for After Take-off and In Flight into one check. The following is for a fictitious aircraft. You will have to develop procedures for your aircraft.]

The following is the procedure, and expanded drill and check, to be carried out in the event of an Engine Failure/Fire – During Take-off, After V_1. This procedure applies for a failure or fire during take-off from immediately after V_1, until autofeather has been selected OFF as part of the After Take-off or Downwind checks. Note the following:

a) The autofeather and power uptrim are assumed to operate correctly except where indicated.

b) No calls are made if automatic systems operate correctly.

c) No action except raising the landing gear is carried out below 400 ft. above the DER (or safe altitude – whichever is higher) if: the autofeather and power uptrim function correctly; or for a fire with the burning engine producing sufficient power.

Table 7-1 Procedure and Crew Coordination

ENGINE FAILURE/FIRE AFTER – DURING TAKE-OFF, AFTER V_1 (PF/PNF)

PF	PNF
If the PF first detects a Failure, Fire, or Severe Damage of an engine, the PNF shall be advised. – Call "Engine Failure # x", "Engine Fire # x", or "Engine Failure and Fire # x." – Or, respond with "Check."	If the PNF first detects a Failure, Fire, or Severe Damage of an engine, the PF shall be advised. – Call "Engine Failure # x", "Engine Fire # x", or "Engine Failure and Fire # x." – Or, respond with "Check."
● Control **Directional Control & Min V_2** Maintain directional control and rotate the aircraft at a rate of about 2^o per second until the pitch attitude approximately matches the Flight Director command cue. Achieve a speed of V_2 until flap retraction. Attempt to achieve the optimum attitude which is the slip/skid ball ½ ball width away from the live engine and 5^o of bank into the live engine. If the control inputs are optimum the Flight Director will command the correct bank. If aircraft is controllable make no call.	–
	● Power **Take-off Power + Uptrim** Confirm power uptrim. If engine power uptrim has taken place, make no call. If power uptrim has not occurred set the

NORMAL PROCEDURES

PF	PNF
	briefed Maximum Take-off Power. – Call "Max Power, xxx Torque Set."
	After lift-off confirm that the aircraft is climbing as indicated by the altimeter, the VSI and, if possible, visually. If the aircraft is in fact climbing: – Call "Positive Rate."
● Gear **UP** At the "Positive Rate" call, confirm a climb on the VSI and visually (if possible). If climbing: – Call "Gear Up" and give the visual signal to retract the landing gear.	Select the landing gear up. Monitor gear retraction. If gear retraction is normal say nothing. If there is a malfunction call "Unsafe Gear".
>> WARNING << Failure of the autofeather may require the crew to perform the ENGINE FAILURE/FIRE Drill prior to 400 ft or safe altitude, and before Flap retraction. If no autofeather and affected engine is not producing sufficient power, call for the Engine Failure or Fire Drill as follows: – For an engine failure, call "Engine Failure Drill # 1 (or # 2) Engine." – For an engine fire, call "Engine Fire Drill # 1 (or # 2) Engine." If no call is made, or if the affected engine is producing sufficient power call for the drill after the flaps have been retracted.	Autofeather **Confirmed** Confirm autofeather and advise status as follows: – Autofeather successful – make no call. – Autofeather unsuccessful – call "Negative Autofeather." – No Autofeather due affected engine still producing power – call "Affected Engine Torque xx" (Say torque on affected engine). If PF calls for the Engine Failure/Fire Drill at this point. Carry it out as described later in this procedure, then return to "Flaps..."
● Flaps **UP (At Safe Alt – Min 400 ft)** Climb at a speed of V_2. At a safe altitude that is at least 400 ft. above the departure runway, accelerate to V_{fri} then: – Call "Flaps Up", and give the visual signal to retract the flaps.	Confirm that the aircraft speed is at least V_{fri} then select the flaps up. Select IAS as the vertical mode of the Flight Director and use the thumb wheel to set V_{climb}: – Call "IAS xxx Selected", where xxx is V_{climb}.
● **Engine Failure/Fire Drill – Affected Engine** Accelerate to V_{climb} and call for the drill as follows: – For an engine failure, call "Engine Failure Drill # 1 (or # 2) Engine." – For an engine fire, call "Engine Fire Drill	Acknowledge by saying the drill to be carried out as follows: – say "Engine Failure Drill # 1 (or # 2) Engine", or – say "Engine Fire Drill # 1 (or # 2) Engine."

EMERGENCY PROCEDURES - EXPANDED

PF	PNF
# 1 (or # 2) Engine."	
Confirm that the PNF's hand is on the power lever for the correct engine. – If correct call "FLIGHT IDLE."	(C) POWER Lever **FLT IDLE** Place hand on the power lever of the affected engine. – Call "# 1 (or # 2) Power Lever." On the PF's confirmation, retard the power lever to FLIGHT IDLE.
Confirm that the PNF's hand is on the condition lever for the correct engine. – If correct call "FUEL OFF."	(C) Condition Lever **FUEL OFF** Place hand on the condition lever of the affected engine. – Call "# 1 (or # 2) Condition Lever." – On the PF's confirmation, retard the condition lever to FUEL OFF.
Continue to climb at V_{climb} and monitor the PNF to the extent that attention to flying permits.	● Confirmed Feather **If reqd – ALTERNATE FEATHER** Confirm that feathering has occurred. – If it has call "Confirmed Feather." – If it has not, select the appropriate ALTERNATE FEATHER switch to ALT, call "Selecting ALTERNATE FEATHER." Then re-confirm feather and call "Confirmed Feather."
	AUX PUMP **OFF** Select the AUX PUMP to OFF for the appropriate engine/tank. – Call "# 1 (or # 2) AUX PUMP OFF."
Confirm that the PNF's hand is on the correct engine T-handle. – If correct call "Pull."	(C) T-handle **Pull** Place hand on the T-handle of the affected engine. – Call "# 1 (or # 2) T-handle." – On the PF's confirmation, grasp and pull the T-handle.
Acknowledge the Engine Failure Drill call: – by responding "Check."	– If there is no Engine Fire call "Engine Failure Drill Complete", and go to the Landing Gear and Flaps cells later in this table. If there is an Engine Fire, proceed as in the next cells.
	Engine Fire ● Extinguisher Switch **FWD BTL**

NORMAL PROCEDURES

PF	PNF
	Select the Extinguisher Switch to FWD BTL, start the timer. – Call "FWD BTL."
	If Fire Warning persists after 30 sec: Extinguisher Switch **AFT BTL** ne fire warning persists for 30 sec. select the Extinguisher Switch to AFT BTL. – Call "AFT BTL."
Acknowledge the Engine Fire Drill call: – by responding "Check." If advised that the Fire Warning persists, as the FO follow the Captain's direction, or as the Captain issue direction for the next action.	If the Fire Warning ceases: – Call "Engine Fire Drill Complete" and proceed to the Landing Gear and Flaps cells later in this table. If the Fire Warning persists advise the PF. If the Captain is the PNF also direct the next action.
Continue to climb at V_{climb} and monitor the PNF to the extent that attention to flying permits.	When flaps have fully retracted re-confirm that the gear is up: – Call "Gear Up, Flaps Up".
When the PNF calls "Gear Up, Flaps Up", if Maximum Take-off Power is no longer required or if the maximum time limit is expended: – Call "Set Max Continuous Power"and give the visual signal to reduce power. – If it is desired to leave the bleed air off, add the direction "Bleed Off."	Select the live engine bleed to ON and MAX. Then reduce to Maximum Continuous power.
Climb to at least 1000 ft. above the aerodrome elevation. – Request the PNF to "Carry out Engine Failure/Fire Check # 1 (or # 2) Engine."	Silently recheck the items of the Engine Failure/Fire checklist, of which the last item is: Engine Shutdown Check Ph. 2 **(Page xx) Complete** Carry out aurally, the Engine Shutdown Check. – When complete advise "Engine Shutdown Check complete."
At a convenient point: – Call for the "After Take-off Check", or the "Downwind Check" if applicable.	Carry out either the "After Take-off Check" or the "Downwind Check" as detailed in the Normal Flight Procedures chapters.

7.7. Engine Failure/Fire – In Flight

[Depending on the characteristics of your aircraft, it may be appropriate to combine the procedures and drills/checks for Engine Failure/Fire After Take-off and In Flight into one check. The format in the section for Engine Failure/Fire – After V_1, may or may not be suitable for an Engine Failure/Fire – In Flight drill for your aircraft. An expanded checklist may be more applicable. You will have to develop procedures for your aircraft.]

The checks and drills for an Engine Failure/Fire – In Flight apply to all phases of flight other than take-off, and include during Missed Approach. The following is the expanded drill and check.

ENGINE FAILURE/FIRE – IN FLIGHT (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.8. Engine Shutdown (In Flight)

The following is the expanded Engine In Flight Shutdown Checklist. The check is in two phases. Phase 1 is to be followed to initiate the shutdown of an engine in flight where there is time to consult the checklist. Phase 2 is to be used to continue the shutdown after phase 1 or to complete the shutdown subsequent to the Engine Failure/Fire After – After V_1 drill or the Engine Failure/Fire – In Flight drill. In either case the check is done by the PNF (and the PF where indicated) with reference to the checklist.

ENGINE SHUTDOWN (IN FLIGHT) (PF/PNF)

Phase 1

Crew/Pax Briefing (PNF) **Complete**

For an intentional shutdown of an engine in flight when there is sufficient time to consult the checklist, there should also be time to brief the crew and passengers. The information listed in the Emergency Landing check should be used as guide for the information to be passed. If time does not permit a briefing before the shutdown, carry out the briefing as soon as possible afterwards.

Control (PF) **Direction & Min V_2/V_{climb}**

Maintain directional control. The minimum speed is V_2 with any flap, or V_{climb} if flapless. Attempt to achieve the optimum attitude which is the slip/skid ball ½ ball width away from the live engine and 5^o of bank

into the live engine. If the control inputs are optimum the Flight Director will command the correct bank.

Power	(PNF) **Max Continuous**
Gear	(PNF) **a/r**
Flaps	(PNF) **a/r**

Flaps may be left at the current setting if not more than ___%. If more than ___% they should be retracted to ___%, unless landing is assured.

Affected Engine

(C) POWER Lever	(PF/PNF) **FLT IDLE**
(C) Condition Lever	(PF/PNF) **FUEL OFF**
Confirmed Feather	**If reqd – ALTERNATE FEATHER**
AUX PUMP	(PF/PNF) **OFF**
(C) T-handle	(PF/PNF) **Pull**

Phase 2

IGNITION–operating engine	(PNF) **MANUAL**
IGNITION–affected engine	(PNF) **OFF**
POWER Levers	(PF)
HYD Press & Qty	(PNF) **Check**
If abnormal	
ENG HYD PUMP check	(PNF) **(Page xx) Complete**

NOTE

For ___% Flap Landing: Landing Field Length = ___% Flap Unfactored Landing Distance multiplied by Factor of ___

>> WARNING <<

Level flight may not be possible with one engine inoperative if landing gear and flaps are extended, without exceeding limitations on the operating engine. If practical do not extend landing gear and flaps until in a position to carry out an uninterrupted descent to landing.

7.9. Engine Hot Start, Failed Start, Clearing Procedure

The following is the expanded Engine Hot Start, Failed Start, Clearing Procedure.

ENGINE HOT START, FAILED START, CLEARING PROCEDURE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.10. Propeller Overspeed

The following is the expanded drill and check for a propeller overspeed in flight.

PROPELLER OVERSPEED (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft – provided of course, that your aircraft has propellers.]

7.11. Fuel Pressure #1 or #2 Engine

The following is the expanded check for low fuel pressure.

FUEL PRESS #1 or #2 ENG (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.12. Engine Hydraulic Pump

The following is the expanded checklist for the illumination of the warning light Engine Hydraulic Pump.

ENG HYD PUMP (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.13. Alternate Landing Gear Extension – Hand Pump

The following is the expanded checklist for Alternate Landing Gear Extension using the Hand Pump.

ALTERNATE LANDING GEAR EXTENSION HAND PUMP (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.14. Unsafe Landing Gear Down Indication

The following is the expanded checklist for an Unsafe Landing Gear Down Indication.

UNSAFE LANDING GEAR DOWN INDICATION (PNF)

If any of the green gear locked down advisory lights fail to illuminate:

Gear Indication System **Test**

If landing gear warning system indicates a fault a normal landing may be performed if the gear can be visually confirmed as safe.

Gear Status **Attempt to confirm visually**

If unable to confirm gear down:

Alternate Landing Gear Extension – Hand Pump **Complete**

>> WARNING <<

Do not re-cycle landing gear up and then down to attempt safe gear indication. Additional damage to landing gear may occur.
If the landing gear unsafe indication is due to malfunction, additional operation may cause further damage and jeopardize the safety of the aircraft.

7.15. DC Generator

The following is the expanded checklist to be carried out for the illumination of the warning light for # 1 DC Generator.

DC GENERATOR (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.16. Flapless Landing

[If Flapless Landing is not an abnormal procedure for your type of aircraft, do not include the procedure in this section. Rather, describe the procedure in the Normal Flight Procedures – Arrival chapter.]

The following is the expanded checklist to be carried out for a Flapless Landing.

FLAPLESS LANDING (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.17. Airframe De-ice Failure

The following is the expanded checklist to be carried out for an Airframe De-ice Failure.

AIRFRAME DE-ICE FAILURE (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.18. Airframe Fire

The following is the expanded checklist to be carried out for an Airframe Fire other than inside the fuselage.

AIRFRAME FIRE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.19. Fuselage Fire/Smoke

The following is the expanded checklist to be carried out for Fire or Smoke in the Fuselage (cabin and flight deck) and for removal of the associated smoke.

FUSELAGE FIRE/SMOKE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.20. Rapid Decompression

[If your aircraft is not pressurized delete this section.]

The following is the expanded checklist to be carried out for Rapid Decompression.

RAPID DECOMPRESSION (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

7.21. Ditching

[In developing procedures for ditching, provide guidance for both if there is time to prepare, and if there is no time to prepare.]

The following is the expanded checklist to be carried out to prepare for and carry out a Ditching.

DITCHING (PF/PNF)

[Insert the passenger briefing/crew coordination procedures, checks, and/or drills for your aircraft.]

7.22. Forced Landing

[In developing procedures for Forced Landing, provide guidance for both if there is time to prepare, and if there is no time to prepare.]

The following is the expanded checklist to be carried out to prepare for and carry out a Forced Landing, where the landing can not be carried out on an aerodrome.

FORCED LANDING (PF/PNF)

[Insert the passenger briefing/crew coordination procedures, checks, and/or drills for your aircraft.]

7.23. Abort/Rejected Take Off

[This section deals with the procedures to be followed for discontinuing a take-off. We have used the term "Abort" in this section. Other popular terms are "Reject" and "Refuse". The choice of terms to be used is yours, however you should be consistent throughout your operation.]

[In developing procedures for aborting a take-off consider the following:

Provide general guidelines for when the take-off should be aborted and when it is probably safer to continue the take-off with a malfunction. In the following example, the guidance refers to the Abnormal Take-off section later in the chapter for situations that do not require an abort.

Make a clear statement that an abort is not to be attempted after V_1. If your type of aircraft requires a procedure for recovery on the remaining runway after V_1, or after the aircraft has lifted off, we recommend that two procedures be developed. One abort procedure would apply to an abort up to V_1. The second procedure would provide guidance for aborting between V_1 and the point where landing on the remaining runway is not feasible.

Provide very clear guidance on the decision making process to abort a take-off or to continue. In developing the guidance consider the following:

Many abort situations do not become apparent until the aircraft speed is very near to V_1.

The process to decide to continue or to abort (including initiation of the abort) shall not take longer than the period allowed for as part of the certification. That is, the time from recognition of a problem at V_1 until the time that deceleration begins is included in the calculation for the performance charts of the aircraft. This time is very brief. In many cases there is only sufficient time to direct that an abort is

to occur. There is likely insufficient time for a discussion that includes a description of the malfunction. Any delay in commencing an abort at V_1 may result in the aircraft running off of the take-off surface, or becoming airborne uncommanded and possibly out of control.

Whatever you determine as the process for deciding to take-off or abort, it must be described very clearly.

We recommend that a drill and checklist be specified for the abort. However, as an effective abort will likely require very coordinated crew actions, a detailed procedure would probably be useful.]

[In our example (for a fictitious aircraft) any flight crew member may initiate an aborted take-off, and both pilots are integrally involved in bringing the aircraft to a stop. For our example aircraft, an abort cannot be safely carried out after V_1.]

A take-off shall be aborted if the aircraft speed has not exceeded V_1, and a situation develops that the safety of the aircraft would be jeopardized if the flight is continued. Any flight crew member may initiate the abort of a take-off provided the aircraft speed has not exceeded V_1. For abnormal or emergency situations when the aircraft speed is in excess of V_1, in most cases the safest course of action is to continue the take-off and deal with the situation in flight. For all aborted take-offs where the aircraft speed has not exceeded V_1, the following procedure is to be used. If it is necessary to abort a take-off at a speed greater than V_1 no procedure is specified. However, it is recommended that the abort before V_1 procedure be used to the extent practical. For situations at or below V_1 where safety of the aircraft would not be jeopardized by continuing the flight, see section on Abnormal Take-offs later in this chapter.

Table 7-2 Procedure and Crew Coordination – Abort

PF	PNF
If PNF initiates abort: – Respond "Aborting." If PF initiates abort: – Call "Aborting" followed by a brief statement of problem.	If PNF initiates abort: – Call "Abort". After PF responds state briefly what the problem is. If PF initiates abort: – Respond "Check."
● POWER LEVERS **Both to Disc** Raise the power lever triggers and select them to the discing position. – Call "Power Levers to Disc."	Monitor.
● Braking **Maximum until stopped** Apply maximum braking until stopped or until it is clear that maximum braking is not required. Initially maximum braking should be applied as brakes	Monitor.

NORMAL PROCEDURES

PF	PNF
may only be available for a brief time. – Call "Brakes." If normal brakes have failed use emergency brakes as described in AFM. – Call "Emergency Brakes."	
● Reversing ***a/r*** Use reversing if necessary and within the limits of directional control. No call is required with this action.	● ATC/Traffic **Advised** Advise ATC or aerodrome traffic of the abort and intentions.
If PF is in the pilot seat, at maximum of ___ KIAS: – Call "Your wheel", and begin steering with the tiller. If PF is in the co-pilot seat, at maximum of 60 KIAS but no later than taxi speed, lock the controls: – Announce "You have control"	If PNF is in the co-pilot seat at a maximum of ___ KIAS: – Reply "My wheel", and lock the controls. If PNF is in the pilot seat upon hearing "You have control": – Reply "I have control", and take over steering with the tiller.
● When aircraft has stopped **applicable drill/check** When the aircraft has stopped carry out the PF actions for the applicable drill. Unless it is obviously safe to taxi, stop the aircraft on the runway.	When aircraft has stopped **applicable drill/check** When the aircraft has stopped carry out the applicable check or drill.
● Evacuation Drill **initiate if req'd** The Evacuation Drill is initiated only if required and only by the Captain. It is carried out by the Pilot, while the Co-pilot prepares to assist in the evacuation.	Evacuation Drill **initiate if req'd** The Evacuation Drill is initiated only if required and only by the Captain. It is carried out by the Pilot, while the Co-pilot prepares to assist in the evacuation.
If it is safe to taxi, clear the active runway.	Advise the other crew members and/or passengers of the intention to evacuate, or that they should remain seated until the aircraft comes to a stop. If time permits briefly announce the cause of the abort and what the planned actions are.

7.24. Evacuation

[In developing procedures for evacuation consider the following:
- Specify the minimum actions that are required to sufficiently shut down the aircraft to make it as safe as reasonable for the passengers to leave the aircraft.
- Specify which pilot/crew member is to carry out which shutdown action.
- As there is potential for injury, specify that if possible the Captain should command the evacuation. Specify the procedures to initiate evacuation if the Captain is incapacitated.
- Specify by individual crew member who is to carry out each action for handling of passengers during the evacuation.
- Provide guidance for handling of disabled and non-ambulatory passengers.
Contact your regional office for additional information on handling of passengers in an evacuation]

Evacuation Drill The evacuation drill is initiated by the Captain using the standard call "Evacuation Drill." If the Captain is unable to issue the command, the FO shall do so. If both the Captain and FO are unable to initiate evacuation, any other crew member may do so if warranted. The expanded evacuation drill follows. The drill as described is predicated on at least one of the pilots being able to carry it out.

EVACUATION (Capt/Pilot)

- EMERGENCY BRAKES (Pilot) **SET**
- Condition Levers (Pilot) **FUEL OFF**
- T-Handle (Pilot) **Pull**

Pull the T-Handle only in the event of an engine fire, and then only the T-Handle of the affected engine. The extinguishers will only arm for one of the engines. Pulling the T-Handles for both engines may select the extinguishers to the wrong engine

- Extinguisher Switches (Pilot) **a/r**

Operate both extinguisher switches for the affected engine.

- EMERGENCY LIGHTS (Pilot) **ON**

- AFTER PROPELLERS HAVE STOPPED
- Evacuation (Capt) **Initiate**

The Captain should command evacuation unless incapacitated. The standard call by the Captain for initiating evacuation is " Evacuate through (indicate the exit to be used)! Now!" The command is to be spoken three times in a clear and very loud voice.

- Electrical Power Systems (Pilot) **OFF**

Electrical power must be available for the Public Address System to be used to command the evacuation. As soon as the command to evacuate is given, the Electrical Power Systems should be selected off.

Passenger Evacuation [Insert the crew duties for handling of passengers during an evacuation.]

7.25. Fire/Smoke on the Ground

[In developing procedures for Fire/Smoke on the Ground it is probably most useful to develop a procedure that leads to the Evacuation Drill. That is, only those actions should be specified that are not included in the Evacuation Drill, but apply specifically to smoke or a fire that occurs during ground operations. An example follows.]

Should smoke or a fire develop during ground operations (such as taxi or engine start), the Fire/Smoke on the Ground drill is to be completed. The drill leads to the Evacuation Drill, which is used to secure the aircraft for evacuation.

FIRE/SMOKE ON THE GROUND (PF/PNF)

- Aircraft (PF) **Stop**

At the first indication of smoke or a fire, bring the aircraft to a stop and set the EMERGENCY BRAKES to PARK.

- ATC (PNF) **Advise**

Advise ATC or any other applicable agency of the problem and request any available assistance.

- Passengers (PNF) **Remain Seated/Standby**

Advise the passengers to remain seated and standby for further instructions.

- Evacuation Drill (Capt) **Initiate**

7.26. Abnormal Take-off

Abnormal Take-off procedures apply when a malfunction occurs during the take-off and initial climb that does not warrant an abort or an emergency drill. It is not possible to specify procedures for the multitude of malfunctions that could possibly occur during take-off. However, the general procedure for an Abnormal Take-off is as follows:

a) Upon noticing a problem the PNF should briefly state the nature of the abnormality.

b) The PF should acknowledge with the standard call "Check."

c) The PNF should carry out any applicable check without further direction, unless it is inappropriate to do so or if the Captain directs otherwise.

d) On completion of any action stemming from an abnormality, the PNF should state the action taken and that it has been completed.

7.27. Stall Recovery

[In this section discuss the procedures for recovery from an impending stall. The objective for most aircraft is to prevent the situation from progressing to an actual stall. If your aircraft has no stall warning system or if your organization is allowed to dispatch with the stall warning system unserviceable, also detail the procedure for recovery from an actual stall.]

[In developing the procedures to recover from an impending stall we recommend that you link to other existing procedures as much as possible. Stalls seldom occur operationally. Therefore, if the stall recovery procedure is substantially similar to another procedure that is used more frequently, there is a higher likelihood of success. In the following example, the stall recovery procedure is essentially a variation of the missed approach procedure.]

[In our example, the fictitious turboprop aircraft has a stick shaker system to warn of an impending stall. The aircraft is not permitted to dispatch with an unserviceable stall warning system. Also, in order to carry out a recovery from a full flap configuration the flaps must be partially retracted.]

a) Stall Indications and Recovery Requirements The first indication of an impending stall for the [insert aircraft type] is high angle of attack and low airspeed. If the impending stall is detected at this point – prior to the activation of the stick shaker, it may be corrected by the crew by increasing the airspeed and reducing the angle of attack. An impending stall that is corrected prior to the activation of the stick shaker does not require that the crew abandon the approach or other procedure that is being carried out. If the situation progresses to the activation of the stick shaker, the procedure being flown should be abandoned and the priority changed to a stall recovery.

b) Stall Recovery Procedures The following procedure should be used to recover from an impending stall when the stick shaker has activated. This procedure may also be used should the crew determine that recovery from an impending stall is appropriate even before the stick shaker has activated.

i) The PF should simultaneously: relax back pressure on the control column; advance the power levers; and call "Go Around", or "Go Around, Flaps Approach" if full flap has been extended.

ii) The PF should roll the wings level (if the aircraft is in a bank) and maintain speed just above the stick shaker activation. The stick shaker may briefly activate during the initial recovery.

iii) The PNF and the PF should then carry out the Missed Approach procedure described in the Normal Flight Procedures – Arrival chapter.

iv) The objective is to fly the aircraft out of a very hazardous situation. However, consideration must also be given to levelling the aircraft at an altitude that will not pose another problem. Such an altitude could be the assigned altitude, the instrument missed approach termination altitude, or applicable minimum safe altitude.

7.28. Pilot Incapacitation

a) General If either pilot develops a physical condition which could adversely affect the operation of the aircraft, that pilot shall inform the other pilot.

b) Pilot Incapacitation – Definition A pilot is deemed to be incapacitated should one or both of the following occur:

i) the pilot does not respond intelligently to two radio, intercom, or directly spoken communications; and/or

ii) the pilot does not respond to a single verbal challenge and a significant deviation from a standard flight profile has occurred.

c) Procedure Should a pilot advise of an incapacitating condition or behave as indicated in the definition of incapacitation (above) the following procedures and considerations apply.

i) The other pilot shall assume control and ensure that a safe flight profile is maintained.

ii) The autopilot should be engaged.

iii) If available, another crew member should be called to the flight deck.

iv) With the other crew member's assistance (if available), the incapacitated pilot's shoulder harness should be locked and the seat moved fully back. Any other actions should be taken that reduce the likelihood that the incapacitated pilot could adversely affect the control of the aircraft.

v) The incapacitated pilot may behave unpredictably and uncontrollably. Therefore, if practicable, the incapacitated pilot should be removed from the seat and replaced with another crew member. Similarly, an unconscious or semi-conscious pilot may slump forward onto the controls placing the aircraft in jeopardy.

vi) If it has been necessary to remove an incapacitated pilot from the flight deck, the pilot shall not be permitted to return to duty – even if it appears that the pilot has recovered.

vii) The aircraft should be landed at the nearest aerodrome where suitable medical assistance is available.

viii) No special landing limits or procedures apply.

d) Command Regardless of which pilot was assigned as in command at the beginning of the flight, after a pilot incapacitation incident, the remaining pilot shall be "in command" for the remainder of the flight.

7.29. Bomb Threat and Hijacking

[Contact your regional office for information on developing bomb threat and hijacking procedures.]

a) Insert your procedure

7.30. Post Evacuation Actions

[It may be in the company's interest to specify the crew's actions in dealing with outside agencies (such as the news media) after an evacuation.]

a) Command At the completion of the evacuation the Ranking Crew Member shall be in charge of the passengers and the aircraft until such time as safety of the passengers and the security of the aircraft is provided for.

b) Actions After the completion of the evacuation the Ranking Crew Member should ensure that the following are carried out:

i) By counting the evacuated passengers and crew, determine that all are accounted for.

ii) Keep passengers together to the extent practical and locate them at a safe distance from the aircraft. Passengers may be disoriented and/or in shock. They may tend to wander about, posing a hazard to themselves and others.

iii) Medical attention is provided to passengers that require it.

iv) To the extent practical and necessary, provide passengers with protection from environmental conditions.

v) Passengers or crew are not to be permitted to return to the aircraft until it is safe to do so.

vi) The aircraft is protected from further damage and from interference if an investigation of the aircraft is likely.

7.31. Wind Shear

[If your operations manual does not provide guidance on avoiding wind shear it may be prudent to insert some guidance here. Insert guidance here on the crew coordination for coping with wind shear should it be encountered.]

a) Insert your procedure

EMERGENCY PROCEDURES - EXPANDED

Annex A to Chapter 7
ABNORMAL AND EMERGENCY PROCEDURES,
ABBREVIATED CHECKLISTS

[The following is an example only. Insert procedures that are used in your operation that are applicable to your aircraft as per the Aircraft Flight Manual.]

Introduction

The abbreviated form of the Abnormal and Emergency Procedures Checklists follow.

COMMON PROCEDURES

ABNORMAL & EMERGENCY PROCEDURES – GENERAL PROCEDURES

A thorough knowledge of procedures is required to deal with Abnormal and Emergency Situations. It is impossible to provide guidance for all situations. Sound judgment must prevail. The following directions apply to all Abnormal and Emergency Situations.

- **FLY THE AIRCRAFT**
- Silence any aural warning. Cancel and re-arm any visual alert.
- Identify the emergency or abnormal condition
- Take the appropriate action

EMERGENCY LANDING

For a landing following an airborne emergency or for any landing when the situation presents a significant hazard, the following points should be addressed:

— As soon as practical after the initial emergency actions, brief the FA or passengers. The amount of detail will vary depending on the time available. The briefing should be in the following format:

- **T**ype of emergency
- **E**vacuation information
- **S**ignals
- **T**ime remaining
- **R**elocation of passengers
- **A**nnouncements

— Advise ATC and any other relevant agencies of intentions and CFR requirements.
— Secure all loose objects on the flight deck and in the cabin.
— Ensure all crew and passenger seat belts and shoulder harnesses are secure and locked.
— Review the applicable post landing procedures with all crew members.
— If applicable: De-pressurize the aircraft and select the Emergency Lights to ON.
— If appropriate, plan for an Evacuation once the aircraft comes to a stop.
— Once the aircraft comes to a stop, specifically direct the passengers to remain seated and await instructions. Then, if appropriate, initiate the Evacuation drill.

ENGINE AND PROPELLER

ENGINE FAILURE/FIRE – DURING TAKE-OFF, AFTER V_1 (PF/PNF)

- Control (PF) **Directional Control & Min V_2**
- Power (PNF) **Take-off Power + Uptrim**
- Gear (PNF) **UP**
- Autofeather (PNF) **Confirmed**

>> WARNING <<

Failure of the autofeather may require the crew to perform the ENGINE FAILURE/FIRE/SEVERE DAMAGE Drill prior to 400 ft or safe altitude, and before Flap retraction

- Flaps (PNF) **UP (At Safe Alt – Min 400 ft)**

● Engine Failure/Fire Drill – Affected Engine

- (C) POWER Lever (PF/PNF) **FLT IDLE**
- (C) Condition Lever (PF/PNF) **FUEL OFF**
- Confirmed Feather **If reqd – ALTERNATE FEATHER**
- AUX PUMP (PF/PNF) **OFF**
- (C) T-handle (PF/PNF) **Pull**

● Engine Fire

- Extinguisher Switch (PNF) **FWD BTL**
- **If Fire Warning persists after 30 sec:**

- Extinguisher Switch (PNF) **AFT BTL**
- Engine Shutdown Check Ph. 2 (PNF) **(Page xx) Complete**

ENGINE FAILURE/FIRE – IN FLIGHT (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

ENGINE SHUTDOWN (IN FLIGHT) (PF/PNF)

Phase 1

Crew/Pax Briefing	(PNF) **Complete**
Control	(PF) **Direction & Min V_2/V_{climb}**
Power	(PNF) **Max Continuous**
Gear	(PNF) **a/r**
Flaps	(PNF) a/r

Affected Engine

(C) POWER Lever	(PF/PNF) **FLT IDLE**
(C) Condition Lever	(PF/PNF) **FUEL OFF**
Confirmed Feather	**If reqd** – **ALTERNATE FEATHER**
AUX PUMP	(PF/PNF) **OFF**
(C) T-handle	(PF/PNF) **Pull**

Phase 2

IGNITION–operating engine	(PNF) **MANUAL**
IGNITION–affected engine	(PNF) **OFF**
POWER Levers	(PF) **SET**
HYD Press & Qty	(PNF) **Check**
If abnormal	
ENG HYD PUMP check	(PNF) (Page xx) **Complete**

NOTE

For ___% Flap Landing: Landing Field Length = ___% Flap Unfactored Landing Distance multiplied by Factor of ____

ENGINE HOT START, FAILED START, CLEARING PROCEDURE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

PROPELLER OVERSPEED (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft – provided of course, that your aircraft has propellers.]

FUEL SYSTEM

FUEL PRESS #1 or # 2 ENG (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

HYDRAULICS AND BRAKES

1 ENG HYD PUMP (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

LANDING GEAR

ALTERNATE LANDING GEAR EXTENSION HAND PUMP (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

UNSAFE LANDING GEAR DOWN INDICATION (PNF)

If any of the green gear locked down advisory lights fail to illuminate:

Gear Indication System	**Test**
Gear Status	**Attempt to confirm visually**

If unable to confirm gear down:

Alternate Landing Gear Extension – Hand Pump **Complete**

>> WARNING <<

Do not re-cycle landing gear up and then down to attempt safe gear indication. Additional damage to landing gear may occur.

EMERGENCY PROCEDURES - EXPANDED

FLIGHT CONTROLS

FLAPLESS LANDING (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

ICE PROTECTION SYSTEMS

AIRFRAME DE-ICE FAILURE (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

AIRFRAME AND FUSELAGE

AIRFRAME FIRE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

FUSELAGE FIRE/SMOKE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

RAPID DECOMPRESSION (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

OFF AERODROME LANDING

DITCHING (PF/PNF)

[Insert the passenger briefing/crew coordination procedures, checks, and/or drills for your aircraft.]

FORCED LANDING (PF/PNF)

[Insert the passenger briefing/crew coordination procedures, checks, and/or drills for your aircraft.]

GROUND EMERGENCY PROCEDURES

ABORT (PF/PNF)

- POWER LEVERS (PF) **Both to Disc**
- Braking (PF) **Maximum until stopped**
- Reversing (PF) **a/r**
- ATC/Traffic (PNF) **Advised**
- When aircraft has stopped (PF/PNF) **applicable drill/check**
- Evacuation Drill (Capt) **initiate if reqd**

EVACUATION (Capt/Pilot)

- EMERGENCY BRAKES (Pilot) **SET**
- Condition Levers (Pilot) **FUEL OFF**
- T-Handle (Pilot) **Pull**
- Extinguisher Switches (Pilot) **a/r**
- EMERGENCY LIGHTS (Pilot) **ON**

- **AFTER PROPELLERS HAVE STOPPED**
- Evacuation (Capt) **Initiate**
- Electrical Power Systems (Pilot) **OFF**

FIRE/SMOKE ON THE GROUND (PF/PNF)

- Aircraft (PF) **Stop**
- ATC (PNF) **Advise**
- Passengers (PNF) **Remain Seated/Standby**
- Evacuation Drill (Capt) **Initiate**

Chapter 8. Safe Operating Practices

8.1. Introduction

This chapter of the SOPs, "Safe Operating Practices" provides guidance for limitations on some types of procedures and describes some procedures that do not appropriately fall in the other chapters. Although some guidance is provided on training, the direction pertains to crew coordination and aircraft operation. Training requirements are found in the Company Operations Manual.

8.2. Restrictions for Specified Operations

The table that follows lists: some operations and procedures; the types of flights that they may be conducted on; and any restrictions that apply. The following abbreviations apply to the types of flights that operations and manoeuvres may be conducted on. The restrictions shown are in addition to any other applicable limitations.

a) ANYFLT Any flight, including any revenue flight.

b) MUTUAL Authorized mutual training. Training other than that conducted under the direct supervision of a training pilot.

c) NONPAX Any flight other than those carrying passengers.

d) SUPVSD Authorized supervised training. Training that is conducted under the direct supervision of a training pilot, and includes dual instruction as part of initial qualification for an aircraft.

e) SIMLTR Permitted only in simulator. Not permitted to be carried out in the aircraft except due to emergency or abnormal situation.

f) TSTFLT Permitted only on authorized Test Flights

Table 8-1 Restrictions for Specified Operations

Manoeuvre, Operation, or Procedure	Type of Flight Auth for	Restrictions
Maximum Performance Take-off and Initial Climb	ANYFLT NONPAX MUTUAL SUPVSD	ANYFLT – Apply Take-off power with brakes on only if required. After lift-off reduce to normal deck angle and climb profile as soon as runway and obstacles permit. NONPAX – Unrestricted. MUTUAL – Unrestricted. SUPVSD – Unrestricted.
Take-off in weather below re-land limits.	ANYFLT SIMLTR	ANYFLT – Capt must be PF. SIMLTR – Unrestricted.
Touch and Go Landing	MUTUAL SUPVSD TSTFLT	MUTUAL – Min usable runway: 5000 FT. with RCR of "Fair" or better. SUPVSD – Min usable runway: 4500 FT. with RCR of "Fair" or better. TSTFLT – Min usable runway: 5500 FT. with RCR of "Fair" or better.
Landing on gravel surface	ANYFLT MUTUAL SUPVSD	ANYFLT – Capt must be PF. MUTUAL – PF must be qualified to Capt status but need not be assigned as Capt for the particular flight. SUPVSD – Unrestricted.
Engine Shutdown, in-fight, actual (other than due to malfunction)	SUPVSD TSTFLT	SUPVSD – On initial training only. Min altitude 5000 AGL. Max distance to usable aerodrome 30 NM. Min weather: visibility 3 SM, no more than scattered cloud below. TSTFLT – When required by maintenance. Restriction as for SUPVSD
Engine Failure or Fire, simulated	MUTUAL SUPVSD	MUTUAL – Shall not be initiated below 1000 AGL. When aircraft re-configuration complete, may operate below 1000 AGL to landing. SUPVSD – Shall not be initiated below 1000 AGL. When aircraft re-configuration complete, may operate below 1000 AGL to landing.
Engine Failure or Fire, between V_1 and 1000 AGL	SIMLTR	SIMLTR – Permitted in simulator only.
Approach to stall	SUPVSD SIMLTR	SUPVSD – Recovery to be initiated on first warning or indication of stall. Minimum altitude 5000 AGL. Min weather: visibility 3 SM, min height above tops of any cloud – 3000 ft. SIMLTR – Unrestricted.
Stall	TSTFLT SIMLTR	TSTFLT – Recovery to be initiated on the first of the following indications: uncommanded nose down pitch, aircraft sink with full nose up elevator command, uncommanded wing drop. Minimum altitude 8000 AGL. Min weather: visibility 3 SM, min height above tops of any cloud – 5000 ft. SIMLTR – Unrestricted.

8.3. Controlled Rest on the Flight Deck

[If your organization is not approved for this type of operation delete this section. If your organization is approved for Controlled Rest on the Flight Deck, guidance is available at CARs 700.24 & 720.24.]

Chapter 9. Sample Checklists

[The following is an example only. Insert procedures that are used in your operation that are applicable to your aircraft as per the Aircraft Flight Manual.]

Pre-flight Checklists

PRE-EXTERNAL CHECK

Chocks	**a/r**
Parking Brakes	**ON**
Batteries	**ON**
External Power	**a/r**
Flight Controls	**Locked**
Safety Equipment	**Checked**
Batteries	**a/r**

EXTERNAL CHECK

Left Right Fuselage

Fuel Caps	**Secure**
Left Fuselage	**Checked**
Left Main Landing Gear Pin	**a/r**

Left Right Engine Nacelle and Wing

No. 1&2 Engine Oil	**Checked**

CAUTION

Ensure oil tank cover is secure. Unsecured oil tank cover will cause complete loss of oil supply.

Wing trailing edge	**Checked**
Wing tip & position lights	**Checked**

INTERNAL CHECK

Passenger Seats	**Checked**
Cabin Oxygen Supply	**Min pres ____ psi**
First Aid Kits	**Checked**
Fire Extinguishers	**Checked**

Cabin Windows	**Checked**

FLIGHT DECK GEOGRAPHIC CHECK – CO-PILOT

[The Flight Deck Geographic Check for the Co-pilot would follow the same format as for the pilot.]

FLIGHT DECK GEOGRAPHIC CHECK – FLIGHT ENGINEER

[The Flight Deck Geographic Check for the FE would follow the same format as for the pilot.]

APU START CHECK (PNF)

Batteries	**ON**
External Power	**a/r**
A/COL Lights	**RED**
APU MSTR	**Press On**
APU START Switchlight	**Press**
RUN annunciator	**RUN (within ___ sec)**

APU AFTER START CHECK (PNF)

APU GEN	**Press GEN**
APU BLD AIR	**Press BLD AIR (after ___ sec)**

APU SHUTDOWN CHECK (PNF)

Batteries	**ON**
External Power	**a/r**
APU GEN	**Off**
APU BLD AIR	**Off**
APU MSTR or OVRSPD TST	**Press**

BEFORE START CHECK (Challenge and Response)

Pre-flight checks	(**All**) **Complete**
Ignition	**NORMAL**
EMERGENCY BRAKES	**PARK**
Engines	**Clear**

Before Start Check	**Complete**

ENGINE START CHECK (PF/PNF)

Engines	(PF/PNF) **Clear**
START SELECT Switch	(PF) **Select #2**
STARTER Switchlight	(PF) **Press**
Clock	(PNF) **Start timing**
Condition Lever (___-___% N_H)	(PF) **START/FEATHER**
Fuel Flow	(PF) **Confirm**
ITT	(PF) **Indication within ___ secs**
Oil Pressure	(PF) **Indication**

NOTE

Minimum oil pressure by completion of engine spool-up during start is ___ PSI. If ___ PSI is not reached by end of spool-up engine must be shut down.

Hydraulic Pressure	(PF) **Indication**
Starter	(PF) **Cut out at approx ___% N_H**
Engine Stabilized	(PF) **Stabilized at approx ___% N_H**
Bleed Air	(PNF) **#2 Bleed ON/MIN**

Repeat above to start No 1 Engine

Engine Start	(PF) **Complete**

TAXI CHECK (Challenge and Response)

Brakes	(PF) **Checked**
Flight Instruments	(PF/PNF) **Checked**
Altimeters	(All) **XXXX inches Set**
APU	(PNF) **Shutdown**
Take-off Briefing	(PF) **Complete**
Taxi Check	(PNF) **Complete**

RUN-UP CHECK (Challenge and Response)

EMERGENCY BRAKES	(PF) **PARK**
Magnetos	(PF) **Checked**
Engine RPM	(PF) **Set to ____ RPM**
Propellers	**Exercised**
Run-up Check	**Complete**

NORMAL PROCEDURES

BEFORE TAKE-OFF CHECK (Challenge and Response)

Standby for Take-off	(FA) **Cabin Secure**
Flight Controls	(PNF) **Checked**
Bleeds	(PNF) **OFF**
	(PNF) **Complete down to the line**

Transponder	(PNF) **ON/ALT**
LANDING & A/COL Lights	(PNF) **ON/WHITE**
Altimeters	(PF/PNF) **Checked**
Compasses	(PF/PNF) **Set/Checked**
Before Take-off Check	(PNF) **Complete**

AFTER TAKE-OFF CHECK (PNF)

Landing Gear	**Up**
Flaps	**Up**
Auto-feather	**Off**
Bleeds	**ON/MAX**
FASTEN BELTS Lights	**a/r**
After Take-off Check	**Complete**

CRUISE CHECK (PNF)

Power	Set

NOTE

It may be necessary to reset the engine power after the aircraft speed has stabilized.

Altimeters	Checked
Pressurization	Checked
Fuel	Checked
Cruise Check	Complete

DESCENT CHECK (Challenge and Response)

Pressurization	(PNF) **Set**
Landing Data	(PNF) **Computed & placarded**
Approach Briefing	(PF) **Complete**
Passenger Briefing	(FA/PNF) **Complete**

Descent Check	(PNF) **Complete**

IN-RANGE CHECK (PNF)

Ignition	**a/r**
FASTEN BELTS Lights	**ON**
Harnesses	(PF/PNF/FA/Cabin) **Secure**
Altimeters	(PF/PNF) **Set**
In-Range Check	**Complete**

DOWNWIND CHECK (PNF)

Autofeather	**Off**
Bleeds	**ON**
Approach Briefing	(PF) **Complete**
Downwind Check	**Complete**

BEFORE LANDING CHECK (PNF)

Landing Gear Lever	**Selected Down**
Synchrophase	(Co-pilot) **OFF**
Propellers	___% or Max
Flaps	**Selected to Approach or Up**
Warning/Caution Panel	**Checked**
Landing Gear	**Down**
Flaps	**Approach Set**
Before Landing Check	**Complete**

FINAL LANDING CHECK (PNF)

Bleeds	**OFF**
Flaps	**Selected to Approach/Land/Up**
Flaps	**Approach/Land Set or Up**
Final Landing Check	**Complete**

AFTER LANDING CHECK (PNF)

Controls	**Locked**
Flaps	**Up**
Landing Lights	**Off**

A/COL Lights	**Red**
Ignition	**NORMAL**
After Landing Check	**Complete**

SHUTDOWN CHECK (Challenge and Response)

Emergency Brakes	**PARK**
External Power	**a/r**
FMS	**a/r**
Power Levers	**Flight Idle**
Condition Levers	**Start & Feather**
STBY HYD Switches	(Co-pilot) **NORM**
Condition Levers	(after ___ sec) **Fuel Off**
Shutdown Check	**Complete**

ENGINE FAILURE/FIRE – DURING TAKE-OFF, AFTER V_1 (PF/PNF)

- Control — (PF) **Directional Control & Min V_2**
- Power — (PNF) **Take-off Power + Uptrim**
- Gear — (PNF) **UP**
- Autofeather — (PNF) **Confirmed**

>> WARNING <<

Failure of the autofeather may require the crew to perform the ENGINE FAILURE/FIRE/SEVERE DAMAGE Drill prior to 400 ft or safe altitude, and before Flap retraction

- Flaps — (PNF) **UP (At Safe Alt – Min 400 ft)**

- **Engine Failure/Fire Drill – Affected Engine**

- (C) POWER Lever — (PF/PNF) **FLT IDLE**
- (C) Condition Lever — (PF/PNF) **FUEL OFF**
- Confirmed Feather — **If reqd – ALTERNATE FEATHER**
- AUX PUMP — (PF/PNF) **OFF**
- (C) T-handle — (PF/PNF) **Pull**

- **Engine Fire**

- Extinguisher Switch — (PNF) **FWD BTL**
- **If Fire Warning persists after 30 sec:**
- Extinguisher Switch — (PNF) **AFT BTL**

- Engine Shutdown Check Ph. 2 (PNF) **(Page xx) Complete**

ENGINE FAILURE/FIRE – IN FLIGHT (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

ENGINE SHUTDOWN (IN FLIGHT) (PF/PNF)

Phase 1

Crew/Pax Briefing	(PNF) **Complete**
Control	(PF) **Direction & Min V_2/V_{climb}**
Power	(PNF) **Max Continuous**
Gear	(PNF) **a/r**
Flaps	(PNF) a/r

Affected Engine

(C) POWER Lever	(PF/PNF) **FLT IDLE**
(C) Condition Lever	(PF/PNF) **FUEL OFF**
Confirmed Feather	**If reqd** – **ALTERNATE FEATHER**
AUX PUMP	(PF/PNF) **OFF**
(C) T-handle	(PF/PNF) **Pull**

Phase 2

IGNITION–operating engine	(PNF) **MANUAL**
IGNITION–affected engine	(PNF) **OFF**
POWER Levers	(PF) **SET**
HYD Press & Qty	(PNF) **Check**
If abnormal	
ENG HYD PUMP check	(PNF) (Page xx) **Complete**

NOTE

For ___% Flap Landing: Landing Field Length = ___% Flap Unfactored Landing Distance multiplied by Factor of ____

ENGINE HOT START, FAILED START, CLEARING PROCEDURE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

PROPELLER OVERSPEED (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft – provided of course, that your aircraft has propellers.]

FUEL SYSTEM

FUEL PRESS #1 or # 2 ENG (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

HYDRAULICS AND BRAKES

1 ENG HYD PUMP (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

LANDING GEAR

ALTERNATE LANDING GEAR EXTENSION HAND PUMP (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

UNSAFE LANDING GEAR DOWN INDICATION (PNF)

If any of the green gear locked down advisory lights fail to illuminate:

Gear Indication System	**Test**
Gear Status	**Attempt to confirm visually**

If unable to confirm gear down:

Alternate Landing Gear Extension – Hand Pump **Complete**

>> WARNING <<

Do not re-cycle landing gear up and then down to attempt safe gear indication. Additional damage to landing gear may occur.

EMERGENCY PROCEDURES - EXPANDED

FLIGHT CONTROLS

FLAPLESS LANDING (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

ICE PROTECTION SYSTEMS

AIRFRAME DE-ICE FAILURE (PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

AIRFRAME AND FUSELAGE

AIRFRAME FIRE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

FUSELAGE FIRE/SMOKE (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

RAPID DECOMPRESSION (PF/PNF)

[Insert the crew coordination procedures, checks, and/or drills for your aircraft.]

OFF AERODROME LANDING

DITCHING (PF/PNF)

[Insert the passenger briefing/crew coordination procedures, checks, and/or drills for your aircraft.]

FORCED LANDING (PF/PNF)

[Insert the passenger briefing/crew coordination procedures, checks, and/or drills for your aircraft.]

GROUND EMERGENCY PROCEDURES

ABORT (PF/PNF)

- POWER LEVERS (PF) **Both to Disc**
- Braking (PF) **Maximum until stopped**
- Reversing (PF) **a/r**
- ATC/Traffic (PNF) **Advised**
- When aircraft has stopped (PF/PNF) **applicable drill/check**
- Evacuation Drill (Capt) **initiate if reqd**

EVACUATION (Capt/Pilot)

- EMERGENCY BRAKES (Pilot) **SET**
- Condition Levers (Pilot) **FUEL OFF**
- T-Handle (Pilot) **Pull**
- Extinguisher Switches (Pilot) **a/r**
- EMERGENCY LIGHTS (Pilot) **ON**

- **AFTER PROPELLERS HAVE STOPPED**
- Evacuation (Capt) **Initiate**
- Electrical Power Systems (Pilot) **OFF**

FIRE/SMOKE ON THE GROUND (PF/PNF)

- Aircraft (PF) **Stop**
- ATC (PNF) **Advise**
- Passengers (PNF) **Remain Seated/Standby**
- Evacuation Drill (Capt) **Initiate**

EMERGENCY PROCEDURES - EXPANDED

Chapter 10. Profiles

NORMAL TAKE-OFF

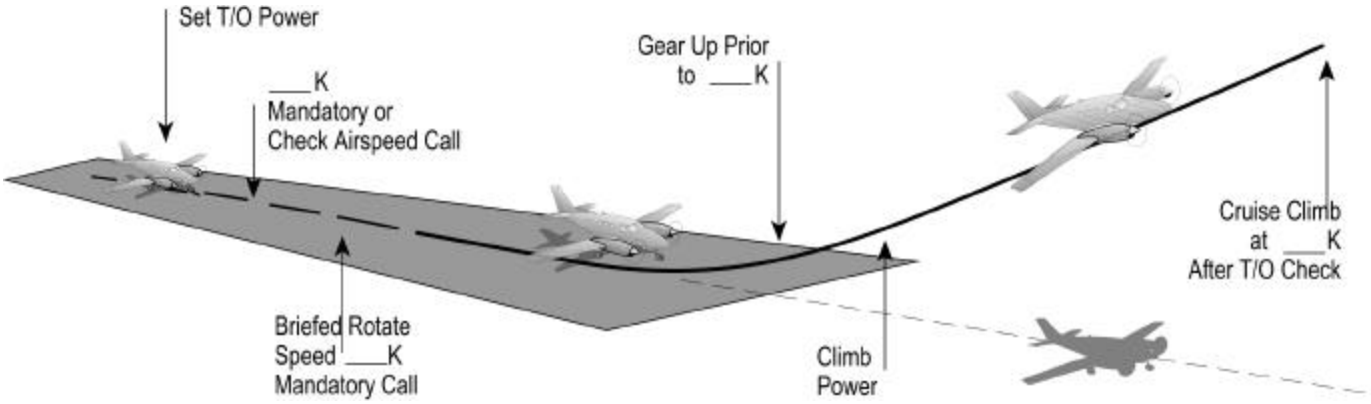

Figure 10 - 1 Normal Take-off

VISUAL APPROACH & LANDING

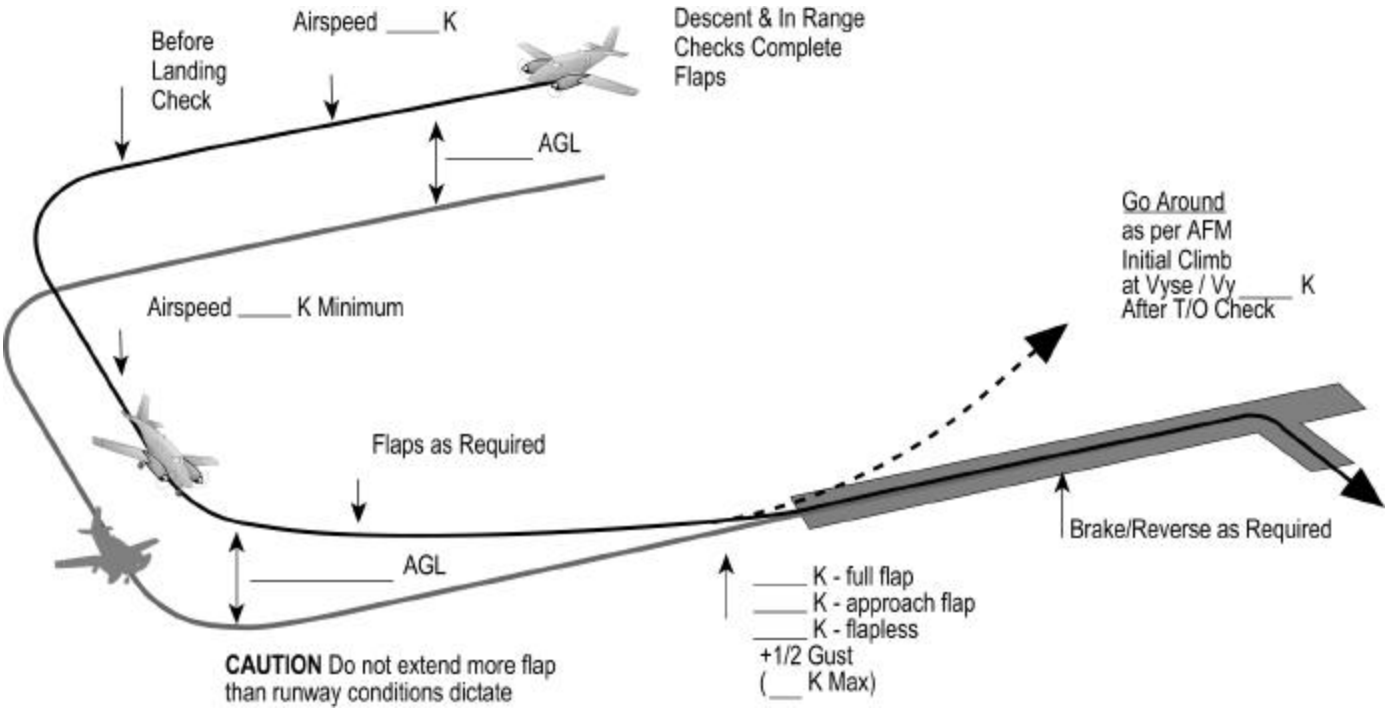

Figure 10 - 2 Visual Approach and Landing

NORMAL PROCEDURES

TOUCH & GO LANDING

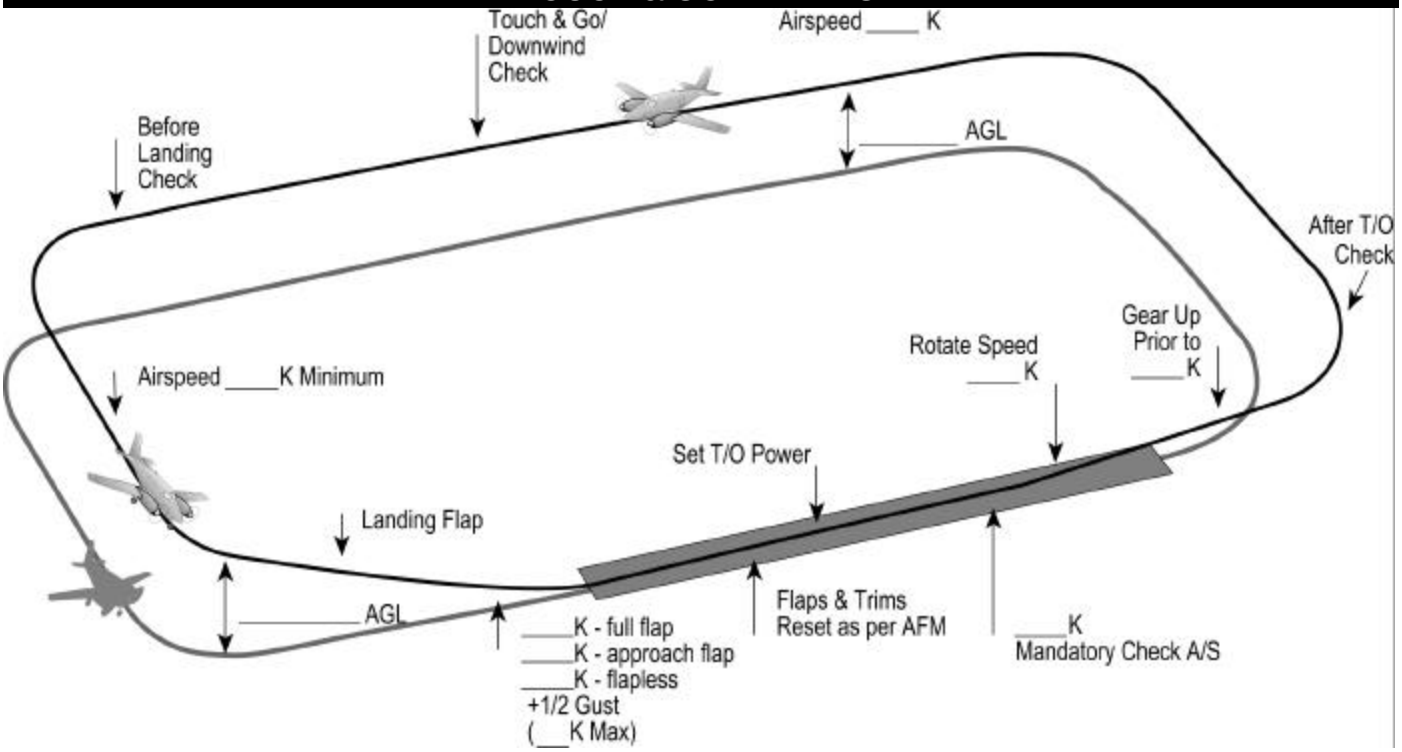

Figure 10 - 3 Touch & Go Landing

PRECISION INSTRUMENT APPROACH

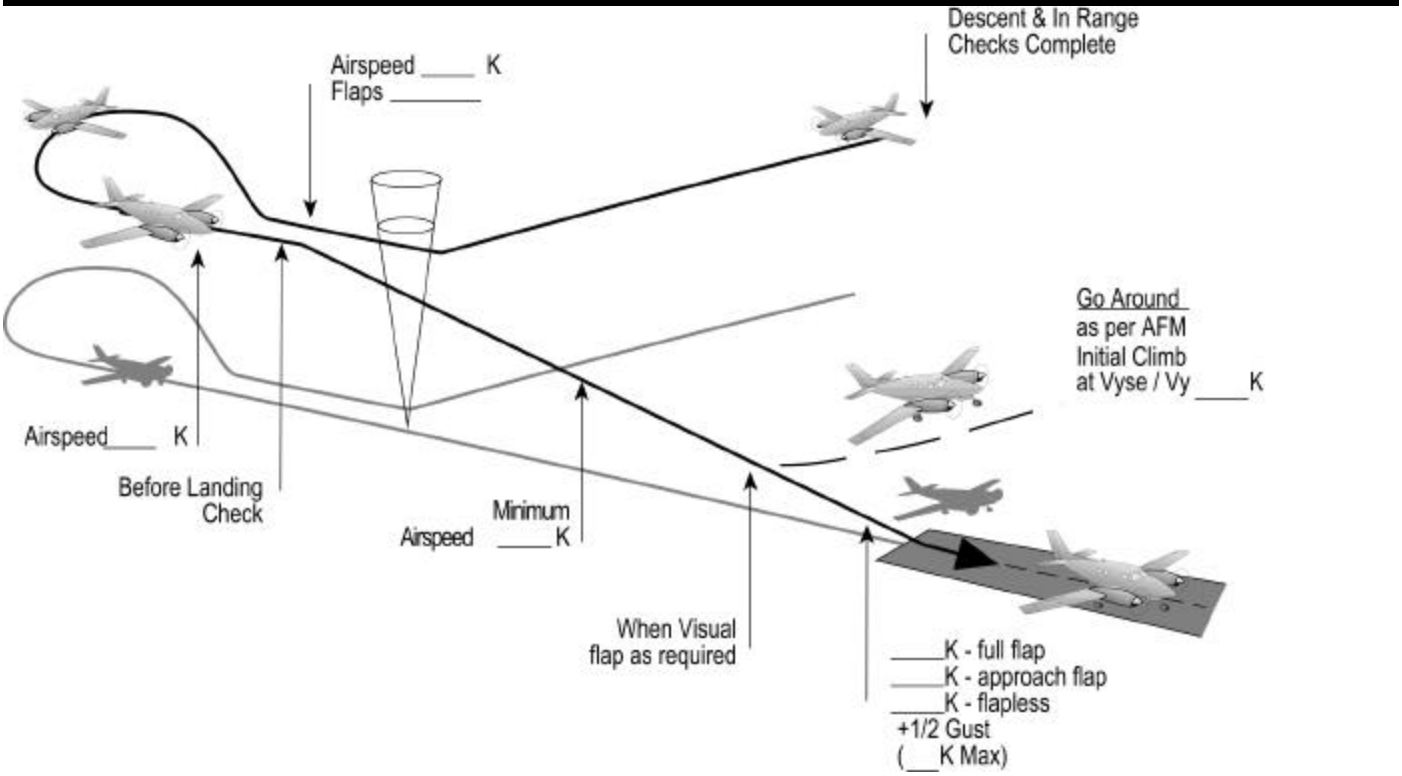

Figure 10 – 4 Precision Instrument Approach

EMERGENCY PROCEDURES - EXPANDED

NON PRECISION INSTRUMENT APPROACH

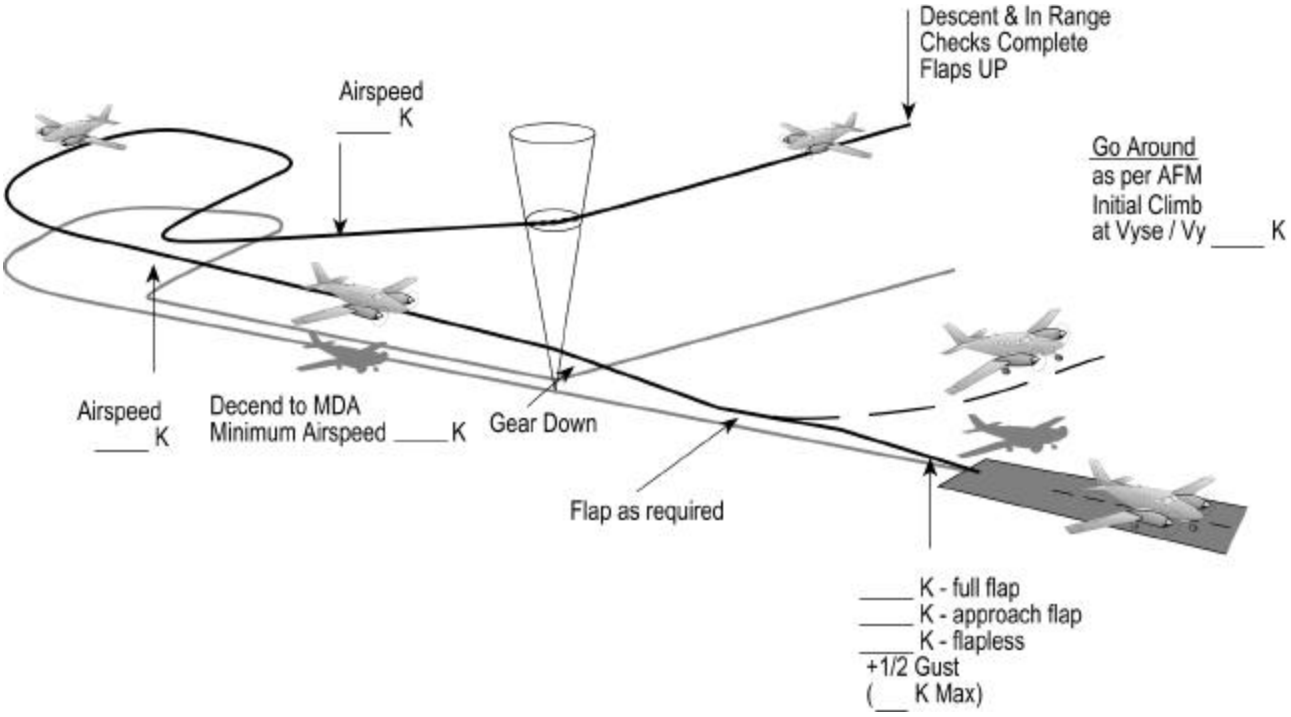

Figure 10 – 5 Non Precision Instrument Approach

REJECT TAKE-OFF

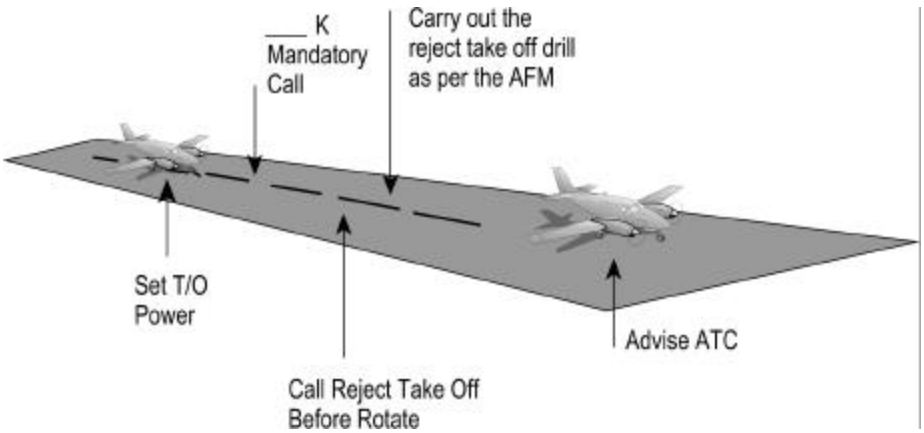

Figure 10 – 6 Reject Take-off

NORMAL PROCEDURES

ENGINE FAIL ON TAKE-OFF

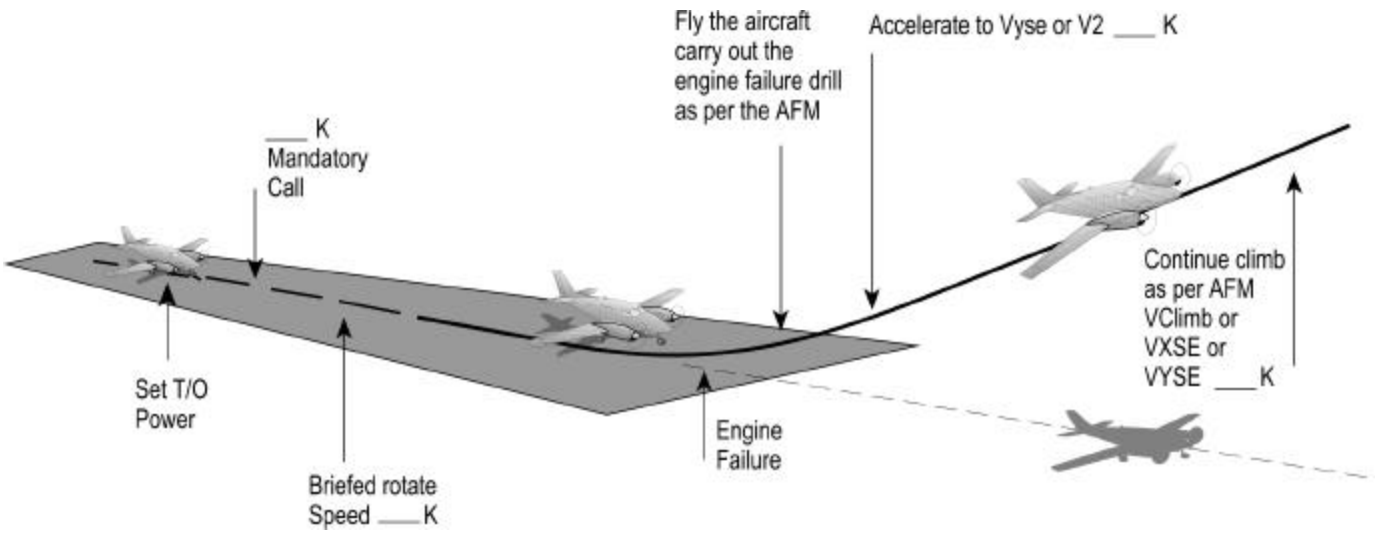

Figure 10 – 7 Engine Failure On Take-Off

SINGLE ENGINE VISUAL APPROACH & LANDING

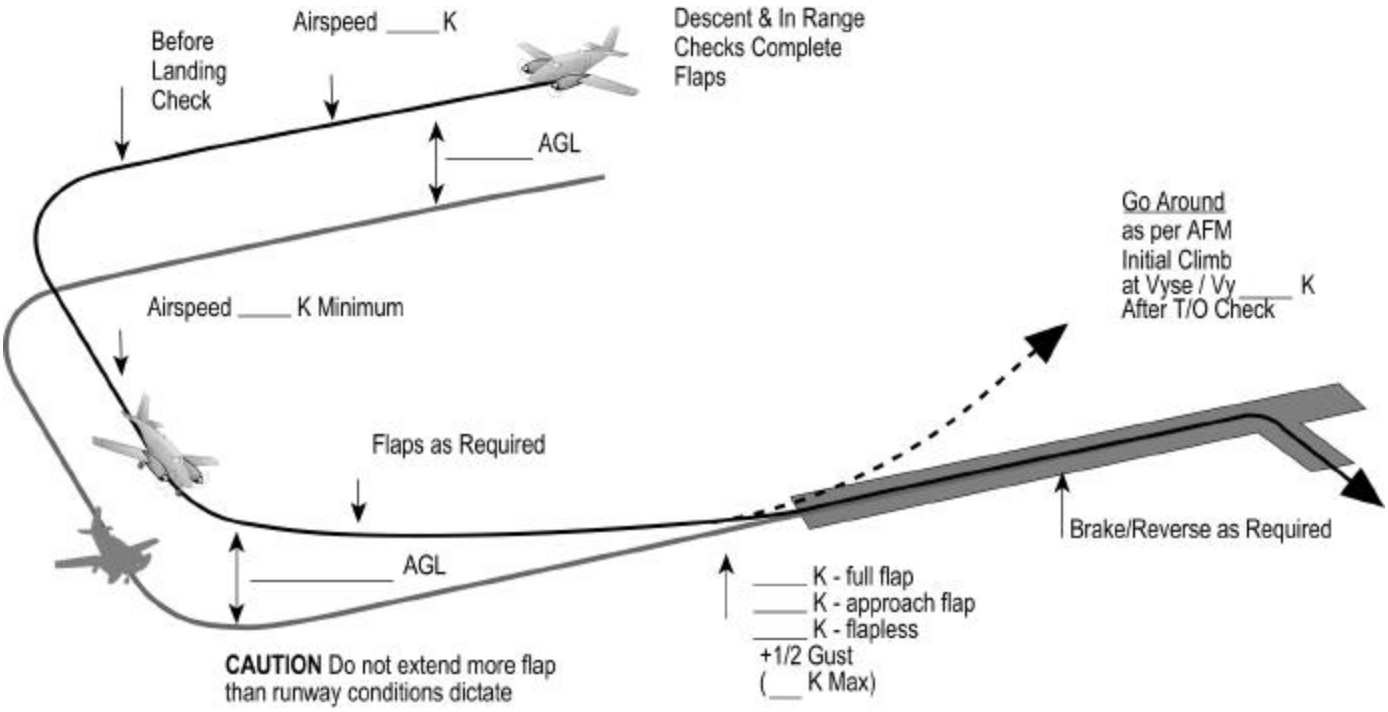

Figure 10 – 8 Single Engine Visual Approach and Landing

EMERGENCY PROCEDURES - EXPANDED

SINGLE ENGINE PRECISION APPROACH

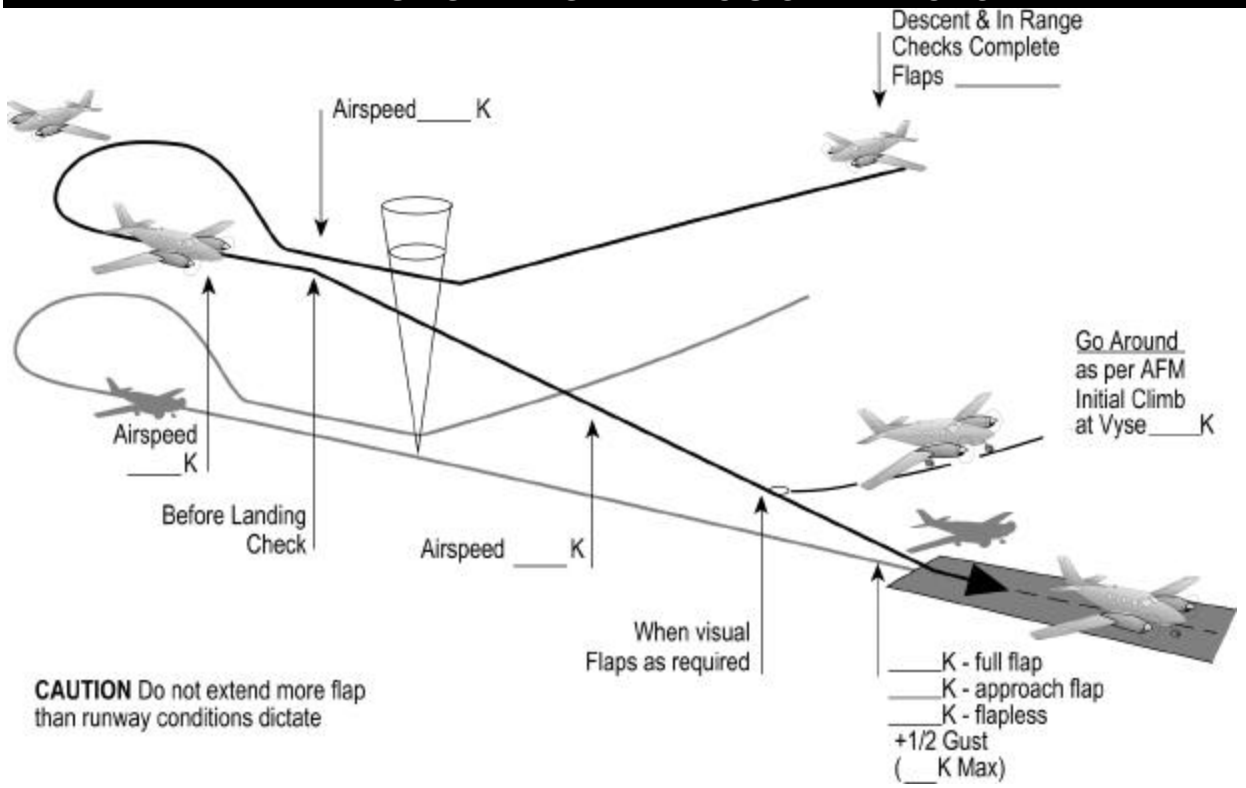

Figure 10 – 9 Single Engine Precision Approach

SINGLE ENGINE NON-PRECISION APPROACH

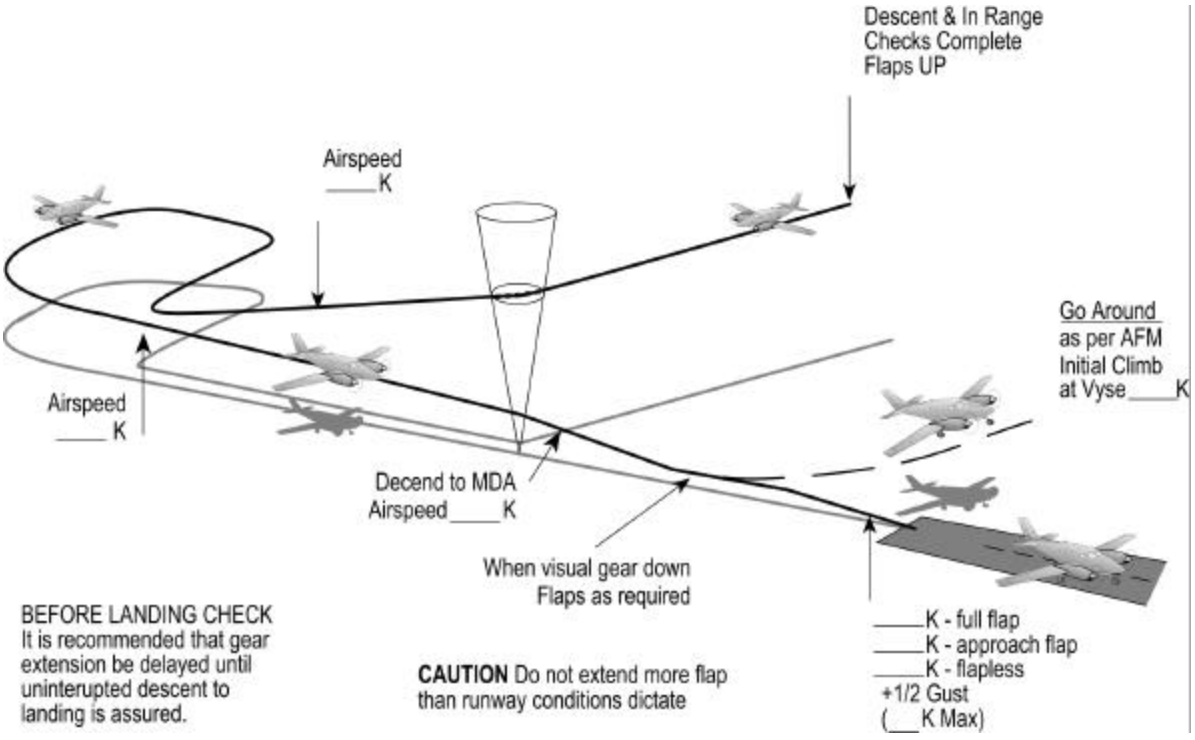

Figure 10 – 10 Single Engine Non-Precision Approach

CIRCLING APPROACH

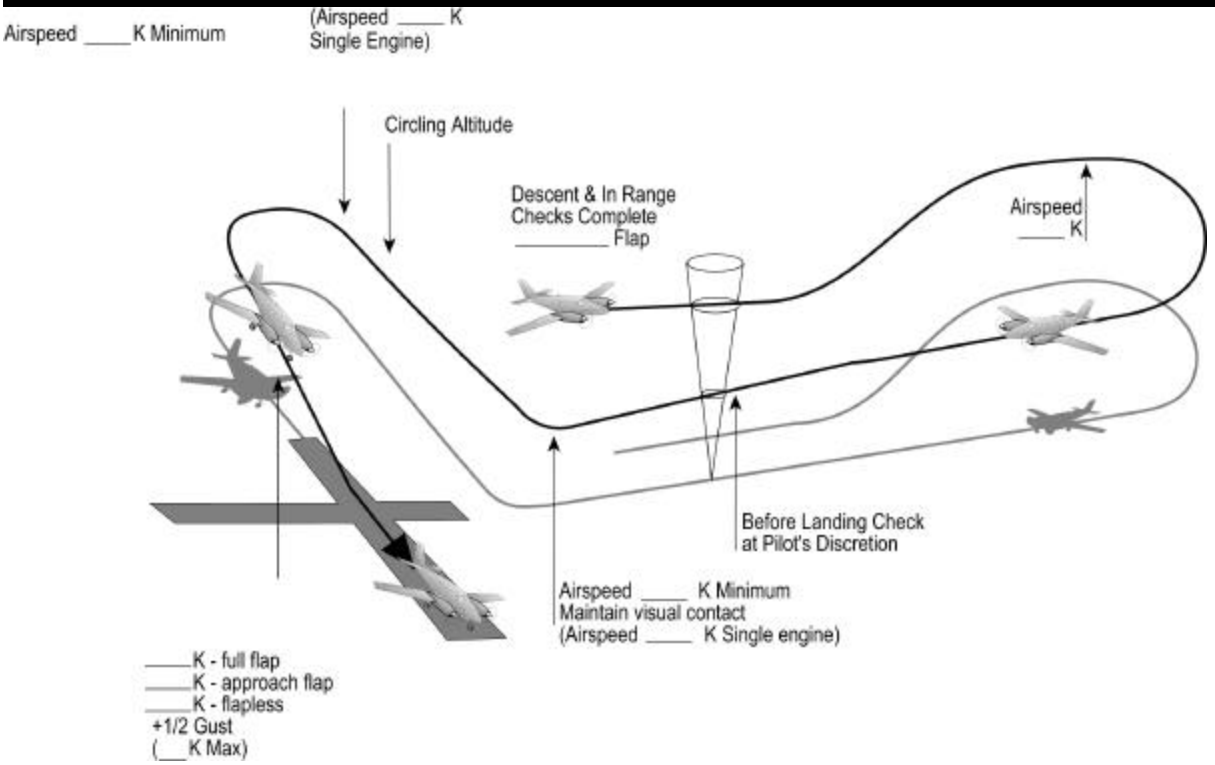

Figure 10 – 11 Circling Approach

EMERGENCY PROCEDURES - EXPANDED

BALKED LANDING

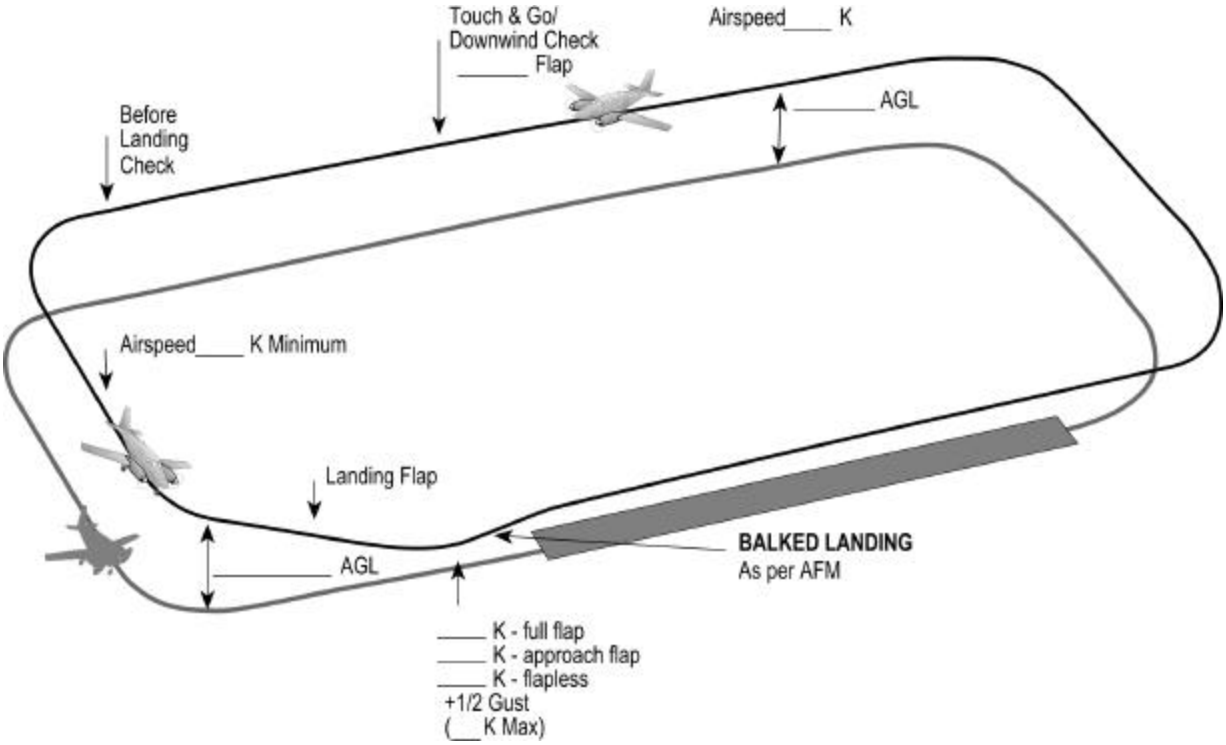

Figure 10 – 12 Balked Landing