Maritime Helicopters

APPENDIX D:

FIXED-WING STANDARD OPERATING PROCEDURES

DHC-6-400

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1 – GENERAL

1.1 PURPOSE

These procedures are in addition to the guidance found in the Maritime Helicopters, Inc. General Operations Manual (GOM). Pilots are expected to be knowledgeable of and comply with all guidance in the GOM as well as this Fixed-Wing Standard Operating Procedures manual. Compliance with Maritime Helicopters, Inc. Fixed-Wing Standard Operating Procedures (SOPs) is mandatory. No portion of the SOPs should be construed as contrary to any Federal Regulation or State Regulation.

The safe and efficient operation of an aircraft utilizing more than one pilot is based on crewmember communication and coordination. The Pilot-in-Command has the responsibility to ensure that the crew coordinate their activities in flight and to ensure that each crewmember is aware of the others intentions. These SOPs stipulate the policies and procedures essential for ensuring that each pilot fully understands his/her responsibilities and duties when functioning as a Captain/Pilot-in-Command or First Officer/Second-in-Command in a multi-crew aircraft.

Collaboration between flight crew, management, other operators and the Original Equipment Manufacturer (OEM) improves the effectiveness of SOPs. Together, managers and flight crews are able to review the effectiveness of SOPs and to reach valid conclusions for revisions with the intention of improving safety and efficiency. Flight crews are encouraged to communicate feedback of these SOPs at all times.

This document is available online for Maritime Helicopter Inc. employees on the SharePoint site. Contact the Chief Pilot for login information.

1.2 SUPPORTING DOCUMENTS

These SOPs supplement and/or expand on the information contained in the following publications:

- AC 120-71B Standard Operating Procedures for Flight Deck Crewmembers
- MHI General Operating Manual
- MHI Pilot Training Program Manual
- Viking DHC-6-400 Aircraft Flight Manual/Pilot Operating Handbook (AFM/POH);
- Honeywell Primus Apex® Integrated Avionics System Common Build
- Viking DHC-6 Twin Otter Series 400 Supplement to Primus Apex® Integrated Avionics System Common Build Pilot's Guide

NOTE: These SOPs are not intended to replace procedures in the AFM/POH but to supplement them; therefore, there are many cases where the SOPs have additional information to that in the AFM/POH.

1.3 NOTES, CAUTIONS, AND WARNINGS

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:

NOTE

Expands on information that has already been provided

CAUTION

Provides information to prevent damage to equipment or to ensure safety of flight

⚠ WARNING

Emphasizes information of immediate flight safety importance

1.4 CHECKS, CHECKLISTS, AND MEMORY ITEMS

1.4.1 GENERAL

Checks, Checklists, and Memory Items have been developed for the operation of the aircraft to ensure that required actions are not inadvertently omitted or completed in an inappropriate sequence. In this manual:

1. A check is a series of actions; a checklist is the physical written document that is associated with the check.
2. Memory Items are checks for an abnormal or emergency situation that require immediate action and are therefore carried out from memory without reference to the checklist.
3. To enhance safety, numerous 1-64-QRH engine failure/shutdown procedures have been combined into one common “Engine Shutdown Memory Items” procedure. AFM/POH and 1-64-QRH references to Power Lever ≈10 PSI torque have been simplified to Power Lever – Idle. Power Lever ≈10 PSI torque is the approximate no thrust setting for simulated engine out maneuvers and is not critical for actual engine shutdown procedures.
4. A Quick Reference Checklist (QRC) has been developed to aid the PM to accomplish the Memory Items and may be used if desired when Memory Items are called for by the PF. QRCs are readily available to both pilots for use inflight.
5. In-flight duties of the pilots are interchangeable; therefore, the terminology Pilot Flying **(PF)** and Pilot Monitoring **(PM)** will be used to distinguish pilot duties.

Normal 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 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 **PM** actions. Therefore, the references in the checklist to **PF** and **PM** are not shown in the expanded procedures. The expanded checklists provide additional detail (if applicable) for each checklist item. The abbreviated form of the checklist is on a laminated sheet that is carried in the aircraft.

1.4.2 COMPLETION OF CHECKS AND MEMORY ITEMS

The PIC is responsible for ensuring that checklists are followed and completed. The Normal checklist is a combination of either “Challenge and Response or “Read and Do”. When a “Challenge and Response” type checklist is called for, the PM will challenge the PF for an action and a response. If the PF responds incorrectly, the PM will state the correct checklist response. When a “Read and Do” type checklist is called for the PM will complete the checklist without challenges to the PF, reading each checklist item aloud as it is completed. Normal checklists are initiated by the PF by calling for the checklist by name (e.g: “BEFORE TAKEOFF CHECKLIST”). The PM will repeat the name of the checklist and then accomplish the checklist items.

For Abnormal/Emergency checklists, the PF will call for the applicable 1-64-QRH procedure after the completion of any required memory items. The PM will name of the QRH checklist, perform the actions (seeking confirmation from the PF, when required) in a read and do manner, restating the checklist responses when the actions are complete.

At the end of all checklists, the PM will state “(CHECKLIST NAME) COMPLETE.”

During Abnormal/Emergency checklists the PF will normally take responsibility for the radios and communications, while the PM is completing the checklist, by stating, “I HAVE THE RADIOS.”

In some cases, crews may prefer to use Flows, which are listed in these SOPs; otherwise checklists should be strictly Read and Do. The crew will complete a flow (commanded verbally or by an action) by memory prior to actioning a check-list. In these cases, the PF will make the call for the checklist once both pilots have completed their respective flows.

Checklists are to be used for all flights in normal and abnormal/emergency situations. Although experienced crews may have them committed to memory, reference must still be made to the checklist. It is possible that a checklist will be interrupted before completion due to radio traffic or other considerations. In this case, the PM shall restart the checklist from the beginning.

1.5 CREW RESOURCE MANAGEMENT

It is of the utmost importance to understand the concept of task sharing. The introduction of more technologically advanced aircraft can induce both pilots to be “heads down,” particularly during abnormal/emergency situations.

1. The PM shall be responsible for ATC and cabin communications during normal flight operations unless communicating on another radio.

2. Programming of the FMS/NAV data will be completed by the PM. The PF will verify all data entered before the entries are activated by the PF.

3. At any point during flight if either pilot’s attention is not directed to the primary tasks, they shall advise the other pilot that they are “heads down.” The other pilot is now responsible for all primary flight tasks.

4. Heads down is only permissible by one pilot at any time.

1.6 CREW COORDINATION

1.6.1 GENERAL

It is absolutely essential that during all phases of ground and flight operation, both flight crew members 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.

1.6.2 ASSUMPTION OF CONTROL

The positive transfer of controls shall not be neglected, even when the autopilot is engaged. 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 and passengers. 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.

1.6.3 TRANSFER OF CONTROL – PF INITIATED

When the PF initiates transfer of control the following procedure shall be used:

1. The pilot relinquishing control will say “YOU HAVE THE AIRCRAFT”
2. The pilot relinquishing control will retain control until:
3. The pilot assuming control says “I HAVE THE AIRCRAFT.”

1.6.4 TRANSFER OF CONTROL – PM INITIATED

When the PM initiates transfer of control the following procedure shall be used:

1. The pilot assuming control says “I HAVE THE AIRCRAFT.”
2. The pilot relinquishing control will say “YOU HAVE THE AIRCRAFT” and will release control.

1.6.5 INFLIGHT PILOT DUTIES

Captain/PIC: is responsible for all facets of the assigned flight and is the final authority for aircraft operations, crewmembers, passengers and safety.

First Officer/SIC: is responsible to the Captain for assisting with the execution of the mission. He/she will ensure all tasks assigned by the Captain are completed in an efficient and expeditious manner.

In-flight duties of the pilots are interchangeable; therefore, the terminology Pilot Flying (PF) and Pilot Monitoring (PM) will be used to distinguish pilot duties. The captain designates which pilot is responsible for flying the aircraft. The PF will not perform any duties which might detract from the primary responsibility of maintaining aircraft control.

The first officer is required to immediately advise the Captain of any deviation from applicable regulations, policies or procedures, or any unsafe condition which may place the aircraft, passengers, or crewmembers in jeopardy. The Captain may choose to disregard this advice, but regardless of the degree or frequency with which advice may go unheeded, flight crewmembers will be held responsible for continuing to offer advice for the Captain's consideration.

Exception: On final approach, if the PM directs a go-around, the PF will immediately execute the go-around unless an emergency situation overrides this requirement.

During taxing operations, the Captain assumes the duties of PF

The First Officer should not make flap configuration changes without the Captain's concurrence.

On all takeoffs and landings below 1000 feet AGL, the PM will be in a position to immediately assume aircraft control if necessary.

1.7 COMMUNICATION

1.7.1 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.

1.7.2 AIRCRAFT INTERNAL COMMUNICATION

Any operational communication whether on the intercom or normal voice should be acknowledged by the recipient. Although it is not possible to specify all appropriate responses, section 1.12 Standard Callouts, covers the majority of the situations.

1.7.3 STERILE COCKPIT

Sterile cockpit procedures will be in effect for all critical phases of flight (taxi, takeoff, approach, landing, all flight operations below 10,000 feet, except cruise flight and during abnormal situations).

A sterile cockpit is to prevent the pilots from being distracted during critical phases of flight. No flight crewmember may engage in or permit any activity during a critical phase of flight which could distract from the performance of any crewmember or which could interfere with the proper conduct of those duties. (e.g. nonessential conversations, eating, use of personal smart phones etc.).

1.7.4 PILOT INCAPACITATION

Cockpit discipline regarding checklists, standard calls and deviation alerts are the key to detecting pilot incapacitation. Any challenge, standard call-out or deviation alert that is not acknowledged and corrective action taken shall be repeated.

1. Incapacitation shall be assumed if the recipient fails to acknowledge the second challenge, standard call-out or deviation alert.
2. If the recipient is the PF, the PM shall assume control by clearly stating “I HAVE THE AIRCRAFT” and the PF will immediately relinquish control and assume PM duties.
3. Once the situation is corrected and no other safety of flight exists, the PF should briefly discuss the situation, (time permitting), and then he/she may transfer aircraft control back to the PM provided conditions warrant it.
4. If the recipient is the PM, the PF shall assume no further assistance is available and act accordingly.
5. A thorough debrief should be accomplished after the aircraft is safely on the ground with engines shutdown.

1.8 COCKPIT AREA OF RESPONSIBILITY

The following are considered the areas that each pilot is responsible for during normal, abnormal and emergency operations.

GROUND	
Captain	First Officer
Start Panel	RH Sub Panel
LH Sub Panel	ELT Switch
Fire, Autofeather and Overspeed Governor Test Switches	Flap Lever (see Note 1)
Power Levers and Prop Levers	
Flap Lever	
Note 1: The flaps are selected by the Captain during the after-start flow, and by the FO after landing.	

FLIGHT	
PM	PF
Start Panel	Power Levers
LH Sub Panel	Flight Controls
RH Sub Panel	
Flap Lever	
Prop Levers	
Fuel Levers	
FMS	
Note: PF may program the FMS/AFSC with autopilot on	

1.9 PRIMARY FLIGHT DISPLAY

Each crew member is responsible for the configuration of their respective PFD. The 5 nm half range should normally be selected for departure.

TCAS should be selected on both PFDs and left in NORMAL mode for all phases of flight.

The TAWS overlay can be selected at pilot discretion, but should be displayed for departures and arrivals in mountainous areas unless convective activity constitutes a hazard. In that case weather radar shall be displayed on the PFD.

Whenever multiple redundant navigation sources are available (i.e. NAV1/NAV2), pilots should use separate sources of navigation to avoid amber display of any NAV sources. Bearing pointers can be set by each pilot on their respective PFD as required.

1.10 SEAT BELT SIGN

The seat belt sign must always be on for take-off and landing. It is recommended to be on during cruise.

1.11 LIGHT USE

The recommended use of lights is as follows:

1. Position (Navigation) Lights:
   a. On when electrical power (Battery or External) has been selected on

2. Beacon Lights:
   a. On just prior to starting engines
   b. Off after both engines shut down

3. Taxi Light:
   a. On just prior to taxi during the Before Taxi Checklist, Off during After Take-off checklist
   b. On during the Descent and Approach checklist or as required
   c. Left on while taxiing after landing until reaching parking position

4. Landing Lights:
   a. As directed by the normal checklist or PF.

5. Strobe Lights:
   a. On whenever the aircraft is maneuvering on a runway regardless of whether that runway is active or not

1.12 STANDARD CALLOUTS

1.12.1 GENERAL

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 Callouts have been established. Standard Callouts are defined and referred to through-out the SOPs. The following are callouts that have broad application and/or are not specifically dealt with elsewhere in this manual. The following charts identify the standard callouts and responses required during all phases of flight.

STANDARD CALLOUTS – ALL PHASES OF FLIGHT			
Phase	**Condition**	**PM Call**	**PF Response**
All	Bank angle above 30º	"BANK ANGLE"	ACKNOWLEDGE
	Abnormally high rate of descent	"SINK RATE"	ACKNOWLEDGE
	Target airspeed deviation (greater than 10 knots above or 5 knots below)	"AIRSPEED"	ACKNOWLEDGE
	Heading deviation (5º or more)	"HEADING"	ACKNOWLEDGE
	ATC heading	"HEADING xxx"	ACKNOWLEDGE
	ATC speed	"SPEED xxx KNOTS"	ACKNOWLEDGE
	En-route navigation CDI alive	"COURSE ALIVE"	ACKNOWLEDGE
	One dot deflection of CDI from desired track	"COURSE"	ACKNOWLEDGE

Note 1: For callout responses referencing ACKNOWLEDGE, the PF will provide a verbal acknowledgement appropriate for the phase of flight or condition.

STANDARD CALLOUTS – POWER SETTINGS			
Phase	**Condition**	**PF Call**	**PM Response**
Takeoff	Set takeoff power	"SET POWER"	"POWER SET"
All	Set max power	"MAX POWER"	"MAX POWER SET"
	Set full power	"FULL POWER"	"FULL POWER SET"
DEFINITIONS			
Takeoff Power	Torque value that must be achieved with 96% Np and T5 at or below 790º C at 0 knots airspeed		
Max Power	Prop levers to 96% Np and power levers advanced until the first red line is reached on either torque (50 psi), T5 (790º C), or Ng (101.6%)		
Full Power	Prop levers to 96% Np and power levers advanced to the forward stops		

STANDARD CALLOUTS – INSTRUMENT APPROACH			
Phase	**Condition**	**PM Call**	**PF Response**
Instrument Approach	At FAF or FAWP	"(FIX NAME), (CROSSING ALTITUDE), MINIMUMS (DA/MDA) SET"	ACKNOWLEDGE
	Localizer based approach, localizer alive	"LOCALIZER ALIVE"	ACKNOWLEDGE
	RNAV approach, CDI alive	"COURSE ALIVE"	ACKNOWLEDGE
	ILS glideslope or RNAV glidepath alive	"GLIDESLOPE / GLIDE-PATH ALIVE"	ACKNOWLEDGE
	One dot localizer deviation	"LOCALIZER"	ACKNOWLEDGE
	One dot of glideslope or glidepath deviation	"GLIDESLOPE / GLIDEPATH"	ACKNOWLEDGE
	100 feet above MDA or DA	"100 ABOVE"	Verify altitude
	At MDA (SCDA) or DA with visual reference	Auto call – "MINIMUMS"	"LANDING" or "GO AROUND"
	At MDA (SCDA) or DA with no visual reference	Auto call – "MINIMUMS"	"GO AROUND, MAX POWER, FLAPS 10"
	At MDA (non-SCDA)	"MDA"	"LEVELING"
	At MDA (non-SCDA) and missed approach point	"MISSED APPROACH POINT"	"GO AROUND, MAX POWER, FLAPS 10"
	PM initiates missed approach	"GO AROUND"	"GO AROUND, MAX POWER, FLAPS 10"

STANDARD CALLOUTS – VISUAL APPROACH			
Phase	**Condition**	**PM Call**	**PF Response**
Visual Approach	On final approach at 500 feet AFE	"500 FEET"	"STABLE"
	VASIS more than 2 lights high/low	"GLIDEPATH"	ACKNOWLEDGE
	PAPI more than 3 red/white	"GLIDEPATH"	ACKNOWLEDGE
	PM initiates missed approach	"GO AROUND"	"GO AROUND, MAX POWER, FLAPS 10"

STANDARD CALLOUTS – ALTITUDE			
Phase	**Condition**	**Captain**	**First Officer**
Climb and Descent	1000 feet above/below assigned altitude, response to 1000 foot chime	"(CURRENT ALT) FOR NEW ALT)"	"(CURRENT ALT) FOR NEW ALT)"

STANDARD CALLOUTS – FLAP OPERATION			
Phase	**Condition**	**PF Call**	**PM Response**
All	Flap setting change	"FLAPS (SETTING)"	"Speed CHECKS, FLAPS (SETTING) SET"

STANDARD CALLOUTS – TAXIING			
Phase of Operation	**Condition**	**Captain Call**	**First Officer Call**
Taxiing	Approaching crossing taxiway	"CLEAR LEFT"	"CLEAR RIGHT"
	Approaching crossing runway	"CLEAR LEFT"	"CLEAR RIGHT"
	Approaching a hold short point (taxiway or runway)	"HOLDING SHORT"	"HOLD SHORT (TAXIWAY or RUNWAY DESIGNATION)"
Note: Due to the location of the nose wheel steering lever, it is assumed that the Captain will always taxi the aircraft.			

STANDARD CALLOUTS – MASTER CAUTION / WARNING			
Phase	**Condition**	**PM Call**	**PF Call**
All	MASTER CAUTION or MASTER WARNING Annunciator	"MASTER CAUTION / WARNING CAS MESSAGE"	"(CAS MESSAGE) QRH"

STNADARD CALLOUTS – EGPWS / TAWS AUTO CALLOUTS			
Phase	**EGPWS Call**	**PF Response**	**PM Response**
All	**"BANK ANGLE"**	**ACKNOWLEDGE**	Verifies correction
	"SINK RATE"	**ACKNOWLEDGE**	Verifies correction
	"MINIMUMS"	**"LANDING"** or **"GO AROUND, MAX POWER, FLAPS 10"**	**"MAX POWER SET, FLAPS 10 SET"**
	Night or IMC **"CAUTION TERRAIN/OBSTACLE" or "TERRAIN TERRAIN PULL UP"**	**"SET MAX POWER"**	**"MAX POWER SET"** See SOP 7.14 for further details

1.12.2 RADIO PROCEDURES

During normal operations the PM is responsible to make any radio transmissions. During abnormal operations, in the absence of the PM, when the PM is engaged in other duties, or should the Captain deem it appropriate, the PF will make any required radio transmissions. The agency that 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 PM is now using No.2 VHF to communicate with Tower, that change shall be brought to the attention of the remaining flight crew members. The procedure for transfer of responsibility for external communications is similar to that for transfer of aircraft control.

CREW COORDINATION – RADIO			
Phase of Flight	**Condition**	**PF**	**PM**
All	Normal Operations	Direct PM if required	Sets comm and Nav frequencies as directed by PF
	Dual Communications required	**"I HAVE COM (1/2)"**	**"YOU HAVE COM (1/2)"** Selects COM 1 or 2 button on audio panel
	Dual Communication Complete	States any changes that have occurred	Deselects COM 1 or 2 button on audio panel. **"BACK ON COM (1/2)"**

Com 1 should be reserved for primary ATC (CLX, GRND, TWR, DEP, CENTER, ARR etc.) communications only.
Com 2 should be used for ATIS and secondary communications such as Dispatch, FBOs and FSS. Com 2 should be set to monitor 121.5 when not otherwise in use.

1.12.3 ALTIMETER SETTING

The crew will decide if the avionics will be set so the altimeters are either synchronized or NOT synchronized (Normally altimeters will NOT be synchronized).

If the altimeters are synchronized, each pilot is responsible for the BARO setting on their respective side.

The left seat pilot is responsible for the ESIS altimeter setting.

In cases where a QFE altimeter setting is used, VNAV must not be used.

STANDARD CALLOUTS – ALTIMETER SETTING			
Phase	**Condition**	**Captain Call**	**FO Call**
All	New altimeter setting/QNH received	"(ALTIMETER SETTING/ QNH) SET LEFT AND CENTER"	"(ALTIMETER SETTING/ QNH) SET RIGHT"
Transition Altitude	After climbing through transition altitude	"TRANSITION, STANDARD SET LEFT AND CENTER"	"TRANSITION, STANDARD SET RIGHT"
Transition Flight Level	Prior to descending through transition flight level	"TRANSITION, (ALTIMETER SETTING/ QNH) SET LEFT AND CENTER"	"TRANSITION, (ALTIMETER SETTING/ QNH) SET RIGHT"

1.12.4 ALTIMETER PRESELECT SETTING

After any altitude assignment has been received by ATC, the crew shall both acknowledge and confirm that the altitude preselect has been set with the correct altitude. This minimizes the possibility of errors and altitude excursions.

CREW COORDINATION – SETTING ALTITUDE SELECTOR			
Phase of Flight	**Condition**	**PF**	**PM**
Autoflight	New Altitude to be set	Sets new altitude **"(ALTITUDE) set"** Leaves hand on knob until confirmation is received	–
		–	Confirms new altitude. **"(ALTITUDE) set"**
Manual Flight	New Altitude to be set	–	Sets new altitude **"(ALTITUDE) set"** Leaves hand on knob until confirmation is received
		Confirms new altitude. **"(ALTITUDE) set"**	–

1.12.5 AFCS MODE SELECTIONS

Any changes to AFCS mode selections must be annunciated to ensure situational awareness is maintained by both pilots. When operating in auto flight, the PF makes mode selections. When operating in manual flight, the PF will direct the PM to make mode selections.

The PF/PM shall confirm that the Flight Director is correctly coupled (L/R) prior to making any mode selections.

CREW COORDINATION – AFSC MODE SELECTIONS			
Phase of Flight	**Condition**	**PF**	**PM**
Auto Flight	Mode setting change	Pushes desired mode button, **"(AFCS MODE) SELECTED"**	–
		Confirms selected mode is armed or active on FMA	–
		–	Verifies active mode
Manual Flight	Mode setting change	**"SELECT (AFCS MODE)"**	–
		–	Selects mode as directed by PF, responds **"(AFCS MODE) SELECTED"**
		Confirms selected mode is armed or active on FMA	–
			Verifies active mode
Note: The annunciation of automatic modes such as ASEL and VSEL is not required.			

1.12.6 FMS PROGRAMMING

All data entry made to the FMS must be confirmed with the other pilot prior to Activation. Data entry that alters the aircraft's current or intended flight profiles will be communicated and verified before activation as shown in the table below.

CREW COORDINATION – FMS PROGRAMMING			
Phase of Flight	**Condition**	**PF**	**PM**
All	FMs flight plan modification required	State modification required. e.g: **"SELECT DIRECT TO SCC"**	**–**
			Makes appropriate selections. Prior to selecting the ACTIVATE button, confirms that the proper selection has been made. e.g: **"CONFIRM DIRECT SCC?"**
All	FMS flight plan modification required	Verifies that the selection is correct and responds with **"ACTIVATE"**	**–**
		–	If flight plan modification involves a direct to clearance and HDG is the current AFSC mode, PM should remind PF to select NAV mode on the AFCS if needed

1.12.7 FMS MESSAGE PROCEDURES

All FMS messages shall be acknowledged by both pilots. FMS messages are annunciated by an amber MSG indication on the right side of each PFD. The messages themselves are displayed on the INAV map.

CREW COORDINATION – FMS MESSAGE PROCEDURES			
Phase of Flight	**Condition**	**PF**	**PM**
All	FMS Message is Presented	**–**	**"MESSAGE: (message as displayed on INAV map)"**
		Directs PM to perform any actions, if required.	**–**
		–	Clears message by pressing MSG CLEAR softkey and performs actions as directed by PF.

2 – USE OF AUTOMATION

2.1 GENERAL

The use of cockpit automation must be standardized, disciplined, and fully integrated in all phases of flight. Because the pilots retain authority in determining the optimal use of automation, the pilots must be proficient in operating the aircraft in all levels of automation and be fully knowledgeable in the selection of the most appropriate level of automation for the situation. If the AP and/or FD do not guide the aircraft where the crew has intended or if the PF is not maneuvering the aircraft in relation to the FD, the PF should disengage the AP and/or FD and fly the aircraft manually.

2.2 MONITORING

The flight procedures in this SOP are designed to ensure that monitoring of the automation in use and aircraft flight path are continuous and on-going processes between the PF and the PM.

Monitoring is a critical piloting skill that is required in the automated cockpit to establish and maintain a shared mental model of the aircraft's current and future state among the crew. The requirement for monitoring exists at all times and is independent of the level of automation in use.

Although both pilots are responsible for monitoring the vertical and lateral flight paths of the aircraft, the PM serves as the primary safety observer for the flight and has the responsibility to remain vigilant to identify and communicate threats to safety. This role is particularly important during critical phases of flight or low altitude operations where aircrew workload increases the potential for error and the consequences of error are the most serious.

2.2.1 ACTIVE MONITORING

This is used to verify that the aircraft's current or actual flight path matches both the commanded flight path and the programmed (future) flight path. Active monitoring always involves measuring one against the other (expected and actual) and if any deviation occurs, either pilot is immediately required to verbalize the deviation. Active monitoring verifies that the flight vector of the aircraft matches the intended, commanded and/or programmed flight vector. The PM shall communicate information to correct errors, counter threats and assist the PF as necessary. The PM is uniquely situated to recognize the presence of threats to safety that may escape the attention of the PF, whose primary attention is focused on aircraft control.

2.2.2 PASSIVE MONITORING

This describes the flight crew's actions while monitoring the aircraft systems through the automated control and monitoring systems installed on the aircraft to ensure the aircraft's actual status is correct and appropriate with desired operating parameters.

2.3 MODE AWARENESS

Complete situational awareness regarding requested and actual FD / AP behavior is essential. The PF must verify all FMA mode changes (except for automatic modes) as if responding to another crew member.

CAUTION

Anytime the AP or FD are in use and a significant mode change is selected, or is scheduled to occur, the annunciation must be verified on the Flight Mode Annunciator (FMA). Aircraft flight path, course, vertical path, and speed must always be monitored and anticipated by both pilots.

During LNAV and VNAV operations, verify all changes to aircraft flight path.

2.4 HEADS UP / HEADS DOWN

Pilots are considered to be heads-down any time they divert attention away from normal PF or PM duties. Momentary, brief scanning and retrieval of information from the FMS or MFD is not considered to be heads-down.

The following is provided for operations during Critical Phases of Flight:

1. If the PF wishes to be heads-down, aircraft control shall be transferred to the PM who shall remain heads-up.
2. If the PM must divert attention away from monitoring duties for an extended period of time, the PM shall state, “heads-down”. Verbal acknowledgment from the PF is necessary to prevent both pilots from being heads-down at the same time.
3. Any crewmember that observes BOTH pilots “heads-down” at the same time shall IMMEDIATELY alert the PF without delay.

Crewmembers shall verbalize when they are heads-up after completing the heads-down task. The PF shall acknowledge this call and brief any status changes. To reduce distraction, the PF may assume external communication responsibilities during extended heads-down operations of the PM (i.e. programing/briefing approaches or multiple leg changes).

2.5 UNEXPECTED AUTOMATION BEHAVIOR

Anytime the aircraft automation provides an unexpected command to the flight controls, the flight crew shall take positive control of the aircraft and ensure the safe flight path is maintained. As necessary, the crew shall revert to lower levels of automation or manual flight, as necessary, prior to attempting to resolve the unexpected automated behavior. If the Autopilot (A/P) is engaged, the PF may need to disconnect the A/P to ensure the safe flight path of the aircraft. If the PF is manually flying the aircraft with FD guidance, the PF shall direct the PM to either de-select the FD or select a basic pitch and vertical flight mode (i.e. heading select and altitude hold).

2.6 FMS

Data entry shall not consume the attention of both pilots and detract from the primary task of flying the aircraft.

A SID shall be loaded in the FMS flight plan if it was included in the ATC Clearance.

A STAR and approach should be loaded in the FMS as soon as practical, immediately followed by selecting VNAV mode on the AFCS/FD

Inflight FMS programming should normally be completed by the PM and acknowledged by the PF prior to activation. During autopilot operations, the PF may perform FMS programming and acknowledged by the PM during non-critical phases of flight. Any waypoints which are not being used for the flight should be deleted from the flight plan.

2.7 AUTOPILOT ALTITUDE RESTRICTIONS

The minimum altitude heights for autopilot engagement are:

1. Takeoff/Climb – 500’ AGL
2. Enroute – 500’ AGL
3. Instrument Approach/Landing – 200’ AGL or DH/DA whichever is higher.
4. VFR or Visual Approach – 500’ AGL
5. Missed Approach/Go-Around – 500’ AGL

3 – PRE-FLIGHT

3.1 FLIGHT PLANNING

3.1.1 DESTINATION WEATHER REQUIREMENTS

In accordance with CFR Part 135.223, for an airport to be selected as a destination the weather reports or forecast, or any combination of them for that airport must indicate that the weather will be equal to or greater than the published minimums (ceiling and visibility) for the approach procedure to be flown at ETA. When there are intermittent weather conditions, they will apply. If inoperative components for an approach exist, adjust the weather planning minimums as indicated on the approach plate.

An alternate is not required for the first airport of intended landing when the weather during the period of one hour before and one hour after the estimated time of arrival, the appropriate weather reports or forecasts, or any combination of them indicate that:

The ceiling will be at least 1,500 feet above the lowest circling approach MDA; or

If a circling instrument approach is not authorized for that airport, the ceiling will be 1500 feet above the lowest published minimum or 2000 feet above the airport elevation, whichever is higher; and

Visibility for that airport is forecast to be at least 3 miles, or two miles more than the lowest applicable visibility minimums, whichever is the greater, for the instrument approach procedure to be used at the destination airport.

Fuel will be sufficient to fly to the destination plus to an alternate (when required) plus 45 minutes reserve at normal cruising speed. An additional 10% trip fuel should be added when an alternate airport is required. An allowance should also be made for start-up and taxi.

3.1.2 DESTINATION ALTERNATE WEATHER REQUIREMENTS

An airport will not be selected as an alternate unless the latest weather indicates that, the weather conditions will be at or above published alternate minimums for that airport at the estimated time of arrival. If alternate minimums are not published, alternate minimums are to be determined from the table below in accordance with MHI OpsSpec C055.

ALTERNATE AIRPORT IFR WEATHER MINIMUMS		
For airports with at least one operational navigational facility providing a straight-in non-precision approach procedure, or CAT I precision approach, or, when applicable, a circling maneuver from an IAP.	Add 400ft to the published MDA(H) or DA(H), as applicable.	Add 1 statute mile (sm) or 1600m to the landing minimum.
For airports with at least two operational navigational facilities, each providing a straight-in approach procedure to different suitable runways.	Add 200 ft to the higher DA(H) or MDA(H) of the two approaches used.	Add ½ sm or 800m to the higher of the two approaches used.

3.1.3 STANDARD TAKEOFF WEATHER MINIMUMS

The standard takeoff minimums are defined as 1 statute mile visibility or RVR 5000 for airplanes having 2 engines or less. RVR reports, when available for a particular runway, shall be used for all takeoff operations on that runway. All takeoff operations based on RVR must use RVR reports from the locations along the runway.

When a takeoff minimum is not published, MHI may use the standard takeoff minimum and any lower than standard takeoff minimum authorized by OpsSpec, (See paragraph 3.1.4 Lower Than Standard Takeoff Minimum). When standard takeoff minimums or greater are used, the Touchdown Zone RVR report, if available, is controlling.

When a published takeoff minimum is greater than the standard takeoff minimum and an alternate procedure (such as a minimum climb gradient compatible with aircraft capabilities) is not prescribed, MHI shall not use a takeoff minimum lower than the published minimum. The Touchdown Zone RVR report, if available, is controlling.

When takeoff minimums are equal to or less than the applicable standard takeoff minimum, MHI is authorized to use a takeoff minimum equal to the lowest authorized straight-in Category I IFR landing minimum for that particular airport. The Touchdown Zone RVR report, if available, is controlling.

3.1.4 LOWER THAN STANDARD TAKEOFF MINIMUMS

When takeoff minimums are equal or less than the standard takeoff minimum and the operation is conducted with the provisions and limitations of OpSpec C079, MHI is authorized to use the lower than standard takeoff minimums described below:

TDZ RVR 1600 or visibility or Runway Visibility Value (RVV) 1/4 sm

To use this provision, the following applies:

1. The PIC must have at least 100 hours as Pilot in Command in the specific make and model aircraft and must have completed training for lower than standard takeoff minimums.

2. Any SIC authorized to manipulate the flight controls during lower than standard takeoff minimums must have logged a minimum of 100 hours in the specific make and model aircraft and must have completed training for lower than standard takeoff minimums.

3. One of the following visual aids must be available:
   a. Operative high intensity runway lights (HIRL).
   b. Operative runway centerline lights (CL).
   c. Runway centerline marking (RCLM)
   d. In circumstances when none of the above visual aids are available, visibility or RVV ¼ statute mile may still be used, provided the other runway markings or runway lighting provide pilots with adequate visual reference to continuously identify the takeoff surface and maintain directional control throughout the takeoff run.

   NOTE: MHI fixed-wing pilots are only trained for operations at or above RVR 1600 or visibility or RVV ¼ SM. IFR operations below RVR 1600 or visibility or RVV ¼ SM are not authorized.

3.1.5 TAKEOFF ALTERNATE REQUIREMENTS

A takeoff alternate is required where weather conditions are at or above take-off minimums but are below authorized IFR landing minimums for that airport. The designated takeoff alternate must be within 1 hours flying time (at normal cruising speed) of the airport of departure and meet the alternate weather requirements listed in paragraph 3.1.2.

3.2 AIRCRAFT PREPARATION AND INSPECTION

Before the first flight of the day the flight crew will perform an external inspection of the airplane. The Pre-Flight Checklist will be completed during this inspection. The first crewmember entering the aircraft will power up the aircraft using the checklist appropriate to the power supply available.

It is the responsibility of the PIC to ensure that the walk around has been completed in its entirety and that the Pre-Flight Checklist is completed and signed.

On through flights, the Captain will do an abbreviated COCKPIT PREPARATION CHECK before initiating the “BEFORE START” checklist. These items include those systems, which require switch repositioning, and items vital to safety of flight. Also, an abbreviated walk around will be performed by a crewmember prior to every flight.

If a crew change is done during the day, the Pre-Flight Checklist will be accomplished. A walk around shall be performed in order to conduct a visual inspection to detect any significant changes to the aircraft condition since the aircraft was parked.

3.3 PRE-TAKEOFF CONTAMINATION CHECK

MHI is authorized to conduct a pre-takeoff contamination check for fixed-wing aircraft in lieu of an approved full ground deicing/anti-icing program any time the conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft.

During such conditions, the PIC will visually check the aircraft prior to engine start and when a takeoff can be completed within 5 minutes of the visual check. If a takeoff cannot be reasonably executed within 5 minutes of the visual check or frost, ice or snow have adhered to the wings, control surfaces, propellers, engine inlets, or other critical surfaces, the PIC will either deice the aircraft by any means available (i.e. contract deicing service or available deicing cart) or terminate flight operations. After deicing the PIC is required to perform another pre-takeoff contamination check to ensure the aircraft will remain free of frost, ice, or snow for a takeoff within 5 minutes of the check. Pilots will be required to be trained on deicing procedures, deice cart operations and have knowledge of operating in ground icing conditions during the initial and recurrent flight training/checks.

Pilots will carry wing, engine, propeller, fuselage and tail covers in the aircraft when operating to remote airports without hangar options during cold weather operations, (below 32° F). If the crew is delayed at a remote location without a hangar and there is potential for frost, ice or snow to adhere to the aircraft, they will immediately install the aircraft covers to ensure the surfaces remain free of any frost, ice or snow. If the PIC feels he/she cannot make a takeoff from a remote airport within 5 minutes of removing the covers when such weather exists, then they will wait until conditions improve and notify the Base Manager (BM) as soon as practical to discuss options.

3.4 PRE-FLIGHT CREW BRIEFING

Before the first flight of the day, the Captain will complete the RAM/Flight Planning Worksheet and a thorough briefing on matters pertaining to the flight. This pre-flight briefing will include, but is not limited to:

1. Flight Profile/Overview
2. Weather/NOTAMs (departure, alternate, destination)
3. Terrain and obstacles
4. Weight and balance (cargo and passenger loads)
5. Maintenance status of the aircraft (inoperative systems, MEL, etc.)
6. Emergency Procedures/Crew Coordination (prior to the first flight of the day; see paragraph 3.6 for details)

3.5 PASSENGER BRIEFING

The PIC is required to give a thorough passenger briefing before each flight which shall include the following as a minimum. A prerecorded video briefing covering these items also meets this requirement.

1. Location and operation of exits
2. Location of fire extinguisher and first-aid/survival kit
3. Location and operation of ELT
4. Seat belt operation and use (takeoff, enroute and landing)
5. Procedures and location for stowing personal belongings
6. No smoking
7. Use of electronic devices

3.6 EMERGENCY PROCEDURES REVIEW

Prior to the first flight of the day, an emergency procedures review/briefing shall be conducted that outlines the actions to be taken in the event of an engine failure, fire, or other serious malfunction during takeoff. This briefing can be conducted on the ground during the pre-flight briefing, or as part of the takeoff briefing.

The briefing should include actions to be taken in the event of:

1. Engine failure before V1
2. Engine failure after V1 and below 400 feet
3. Any other malfunction affecting the ability to safely fly the aircraft

The following is an example emergency briefing as given by the PF:

“Any failure affecting safety prior to V1, either pilot will call “REJECT.” I will retard the power levers to idle, apply brakes, stop the aircraft, and then call for the applicable QRH checklist. You will advise ATC of the situation and inform the passengers to remain seated.

In the event of an engine failure after V1, I will call “MAX POWER, FLAPS 10, CONFIRM FEATHER.” You will confirm the failure and that the propeller has feathered. If it has not feathered, you will feather the propeller on my command.

At 400 feet (or a safe altitude) I will call “ENGINE SHUTDOWN MEMORY ITEMS” and continue on the departure procedure. When clear of obstacles we will complete the “ENGINE SHUTDOWN QRH” followed by a “CAS MESSAGE REVIEW” and “AFTER TAKEOFF CHECKLIST.”

3.7 TAKE-OFF/DEPARTURE BRIEFING

Prior to takeoff, the PF will review the departure procedure/SID, and brief the following items as applicable:

1. Departure Runway/Taxi (length, condition, restrictions)
2. ATIS/Weather/Take-off minimums/Departure Alternate
2. ATC Clearance/FMS
3. Departure Procedure (SID, DP, RNAV, VFR etc.)
4. Terrain/Obstacles
7. Climb Performance (obstacle/ATC climb gradients, crossing heights etc.)
8. Emergency Procedures/Crew Coordination (if not completed during Pre-Flight Briefing)

4 – DEPARTURE

4.1 INTRODUCTION

This chapter provides guidance for normal operations from the start of an engine through the departure and climb portion of the flight and up to, but not including, level-off.

4.2 COCKPIT PREPARATION CHECKLIST

The cockpit preparation checklist is normally accomplished by the captain from memory and then verified with the checklist. During initial training it is acceptable for both pilots to perform the checklist in a challenge-response manner.

COCKPIT PREPARATION CHECKLIST (Memory)	
First Officer	**Captain**
"Control Locks"	**"Removed"** Ensure both upper and lower control locks are removed and safely stowed behind the pilot seat.
"ESIS Power"	**"Armed"** Verify that ESIS power is functional prior to selecting aircraft master switch on.
"Emergency Lighting"	**"Armed"**
"Circuit Breakers"	**"All In"** Pay special attention to high load CBs such as C6, A7, and B7, as maintenance may have pulled these breakers during inspections.
"Generators"	**"Off"**
"Landing Lights"	**"Off"**
"Ignition Switch"	**"Normal"**
"Battery and External Switches"	As Required - **state switch selection(s)**
"Avionics Start Battery"	**"Auto"**

COCKPIT PREPARATION CHECKLIST (Memory) - *continued*	
First Officer	**Captain**
"Power Levers"	**"Idle"**
"Prop Levers"	**"Max RPM"** Feather can be selected for floatplane operations or if needed to minimize propeller blast in apron areas.
"Fuel Levers"	**"Off"**
"Fuel Emergency Switches"	**"Normal"**
"Boost Pump 2 Switches"	**"Emergency/Normal"** Monitor fuel low pressure indications and CAS messages. When Emergency is selected, amber Pmp2 indication and "Pump 2 Low Pressure" CAS message should extinguish for the respective tank.
"Boost Pump 1 Switches"	**"Test/On/Off"** Monitor fuel low pressure indications and CAS messages. When On is selected, all amber low-pressure indications and CAS messages should extinguish for the respective tank. When Test is selected, amber Pmp2 indication and "Pump 2 Low Pressure CAS message" should extinguish for the respective tank (the Test position simulates failure of boost pump 1 and tests the automatic changeover system).
"Fuel Selector"	**"Aft/Normal/Fwd/Normal"** Test function of the crossfeed valve and associated logic. When individual tank is selected, verify CAS displays "Crossfeed Both Aft/Fwd," green Crossfeed annunciator is displayed, and that both Pmp1 and Pmp2 amber low-pressure indications for opposite tank are displayed.
"Fire Warning System Test (10)"	**"Tested"** A total of 10 fire warning lights, plus the aural "Fire, Fire" warning must be checked. Verify that both MASTER WARNING, two "Engine Fire" CAS messages, four red "Fire" indications on T5 gauges, and both fire switch lights illuminate.
"Ice & Rain Switches"	As Required - **state switch selection(s)**
"External Lighting Switches"	As Required - **state switch selection(s)** Position lights should be selected on. Other lights as desired.
"Internal Lighting Switches"	As Required - **state switch selection(s)**
"Caution Lights Test (11)"	**"Tested"** Verify that 11 caution lights illuminate. Each Autofeather switch counts as two lights (i.e: SELECTED and ARMED)
"Environmental Switches"	As Required - **state switch selection(s)**
"Surface De-Ice Switches"	**"Off"**
"Configuration Switches"	**"Normal"** If Track Source switch was inadvertently selected to MAG or GPS, verify that the proper track source selection is set in the Avionics Window of the lower MFD.
"Ram Air Handle"	**"Set"**
"Standby Instrument Static Source"	**"Normal"**

COCKPIT PREPARATION CHECKLIST (Memory) - *continued*	
First Officer	**Captain**
"Cabin Air Handle"	**"Set"**
"Documents"	**"Available"**
"Emergency Equipment"	**"Checked"**
"Hydraulic Pump Handle"	**"Stowed"**
"Rudder Pedals, Seats, and Harnesses"	**"Set L/R"**
"CAS Messages"	**"Checked"** Verify that all displayed CAS messages are appropriate. Engine start is forbidden if the "Hydraulic Power Fail" CAS message is present.

4.3 BEFORE START

4.3.1 BEFORE START CHECKLIST

The checklist is performed in a challenge-response fashion by both pilots, with the First Officer reading the checklist, and the Captain responding.

BEFORE START CHECKLIST (Challenge – Response)	
First Officer	**Captain**
"Exterior, Cockpit, & Cabin Preparation"	**"Complete"** Exterior inspection and cockpit preparation checklist are complete. Cabin and passengers are secure and doors are locked.
"Passenger Briefing"	**"Complete"**
"Hydraulic Pressure"	**"Checked"**
"Parking Brake"	**"Set"**
"Boost Pump 1 Switches"	**"On"** Verify that no low pressure indications or CAS messages are present.
"Fuel Quantity"	**"XXXX lbs"**
"Battery Volts"	**"XX.X volts"** For battery starts a minimum of 23.5 volts is required. If battery voltage is low, the battery must be recharged or external power used for start.
"Beacon"	**"On"**

An external power supply must be able to supply 1700 Amps (momentary) and 800 (continuous) @28.0 – 28.4 Volts.

Prior to conducting an external power start, it is recommended that communication procedures/signals be reviewed with the ramp crew.

4.4 ENGINE START

4.4.1 CREW COORDINATION

CREW COORDINATION – ENGINE START	
Captain	**First Officer**
–	Verify that doors are closed and no Doors Unlocked CAS message is present
"BEFORE START CHECKLIST"	Actions before start checklist and then states **"BEFORE START CHECKLIST COMPLETE"**
"CLEAR RIGHT?"	Visual confirm propeller area clear, states **"CLEAR RIGHT"**
"STARTING RIGHT ENGINE"	–
Selects and holds start switch in the RIGHT position. Verbal callouts as per notes below.	Monitors engine start procedure and calls out any abnormalities
Releases start switch at 51% NG	–
Observes that "Right Generator Off" CAS message illuminates, states **"RIGHT GENERATOR OFF"**, followed by **"START COMPLETE"**	–
Visually confirms propeller area clear, states **"CLEAR LEFT"**	–
"STARTING LEFT ENGINE" Completes engine start in the same manner as above.	–

4.4.2 START CALLOUTS (CAPTAIN)

During the first engine starts of the day, the Captain should make the following calls in sequence. During subsequent starts the Captain may make start callouts if desired but as a minimum, each condition needs to be verified by both pilots.

START CALLOUTS (Captain)	
Condition	**Callout**
START switch is selected LEFT or RIGHT	**"STARTER ON"**
NG increasing	**"NG"**
Oil pressure increasing	**"OIL PRESSURE"**
NG stable above 12%	**"NG STABLE XX%"**
Select fuel lever on	**"FUEL ON"**
Fuel flow increases	**"FUEL FLOW"**
T5 increasing	**"T5"**
NG stable at ~51%	**"NG AT IDLE"**
Start switch released, "Right/Left Generator Off" CAS message appears	**"RIGHT/LEFT GENERATOR OFF"**

4.4.3 Indications of a weak battery during engine start are:

1. Trim indications temporarily display an amber [X]
2. PFDs temporarily indicate a red [X]
3. Spurious CAS messages
4. One or more displays go blank

It is normally possible to start both engines from the battery without recharging the battery between starts. However, if any of the above occurs on a successful first start, recharge the battery by advancing the power lever to at least 59% NG, re-setting the generator, wait until the battery charge current decreases to less than 40 amps, and then turn the generator off.

Do not select the FUEL lever to ON before NG is stabilized and maximum motoring has been achieved. The minimum stabilized NG required to obtain satisfactory light up is 12%. Any start attempt below this speed is considered hazardous. If the engine fails to light within 10 seconds of advancing the FUEL lever, or if engine over temperature seems imminent, select the FUEL lever to OFF to stop fuel flow and continue to motor the engine with the starter for approximately 10 seconds. Observe the required starter cooling period and allow the engine to come to a complete stop before attempting a new start.

4.5 AFTER START

4.5.1 AFTER START FLOW

After the second engine is started and the second generator brought online, the Captain conducts a geographic flow. This is not a checklist but a memorized series of actions.

While the Captain completes the after start flow, the FO may begin recording the ATIS, requesting an IFR clearance and programming the FMS. The Captain may temporarily interrupt this process by calling for the After Start Checklist.

AFTER START FLOW
Captain
If an external power start was completed, move the EXTERNAL switch to OFF and signal for the ground power to be removed.
Ground power disconnected (if applicable)
Increase NG to at least 59%, select generator switches to RESET momentarily, then to ON. Observe electrical indications on lower MFD to ensure that generators are operating normally. Ensure Generator Off CAS messages disappear. This is primarily for battery starts to prevent a high amperage draw on the generators at low NG rpm when the battery is charging. An increase in NG to 59% is not normally needed after External starts when the Generators are turned on.
Select flap 10º. Due to some aircraft having a tendency for the flaps to flex due to propeller slipstream or relative airflow during takeoff, set flap 8-12º as required to achieve flap 10º on takeoff.
Select Autofeather
Configures flight director as required (normally GA and HDG bug set to runway heading)
Calls for **"AFTER START CHECKLIST"**

4.5.2 AFTER START CHECKLIST

The After Start Checklist is accomplished in a challenge-response manner with the First Officer reading the checklist and the Captain responding.

AFTER START CHECKLIST (Challenge-Response)	
"Battery Switch"	**"On"**
"External Switch"	**"Off"**
"External Power"	**"Disconnected"** Verify external power has been disconnected on the electrical window of the lower MFD
"Generator Switches"	**"On"** Verify that generators are both on and operating normally
"Environmental Switches"	As Required - **state switch selection(s)**
"Flaps"	**"10 Set"** Verify that flap lever is set to the 10º position and that flap indicator shows green.
"Auto-Feather"	**"Selected"** Verify that Autofeather switch light shows SELECTED
"Trims"	**"Set for Takeoff"** Verify that pitch and rudder trim are in the green takeoff range. Roll trim should be centered, or as appropriate for the specific aircraft.
"CAS Messages"	**"Checked"** Examine all CAS messages to ensure that they are appropriate.

4.6 SYSTEM CHECKS

Systems checks should be completed once per flight, once per day or once per week, as applicable. Systems checks are normally done on an apron area or taxiway where propeller blast will not have a negative effect on other aircraft or personnel.

Prior to beginning any engine related checks, ensure that the oil pressures are satisfactory and the oil temperatures are above 10°C. The aircraft should be headed into wind for engine and system checks.

During initial training it is recommended that both pilots observe the Systems Checks, however during normal operation of the aircraft it is recommended that the FO silently complete the Before Taxi Checklist while the Captain completes the System Checks from memory. This is to ensure that the tasks required to complete the takeoff are completed in an expeditious manner.

SYSTEMS CHECKS (Memory)	
"Autofeather System Test" (7 day)	**"Tested"** See SOP or AFM/POH 4.8.1.1
"Overspeed Governor Test" (24 hours)	**"Tested"** See SOP or AFM/POH 4.8.1.2
"Beta Range Annunciation Test"	**"Tested"** See SOP or AFM/POH 4.8.2
"Reset Props Annunciation Test"	**"Tested"** See SOP or AFM/POH 4.8.3
"Intake Deflectors Test" (If required)	**"Tested"** See SOP or AFM/POH 4.8.4
"De-Icing System Test" (If required) - Read & Do	**"Tested"** See SOP or AFM/POH 9-1.4.7
"AFCS Tests" (If required)	**"Tested"** See SOP or AFM/POH 9-50.4.1.2

4.6.1 AUTOFEATHER SYSTEM TEST

1. Power levers – IDLE
2. Feather and unfeather each propeller once.
3. Reverse each propeller once. It is sufficient to momentarily move the power lever to the zero thrust position, an increase in NG in reverse is not required. Return power levers to IDLE.
4. Depress the AUTOFEATHER switchlight and confirm that the SELECTED [SELECT] light in each switchlight illuminates, and the AUTOFEATHER SELECTED advisory CAS message appears.
5. Advance the power levers until the ARMED light in the AUTOFEATHER switchlight illuminates (approximately 25 to 30 PSI torque, will vary with temperature and pressure altitude).
6. Lift and hold the AUTOFEATHER SYSTEM TEST switch.
7. Quickly retard the left power lever to IDLE. Check that the ARMED light extinguishes, and that the left propeller feathers approximately two seconds after the power lever is retarded to IDLE. Check that the LEFT AUTO-FEATHER advisory (cyan) CAS message appears.
8. Retard the right power lever to IDLE. Confirm that the right propeller does not feather.
9. Release the AUTOFEATHER SYSTEM TEST switch.
   Check that the RIGHT AUTOFEATHER advisory (cyan) CAS message appears.
10. Repeat steps 5 through 9, transposing the left and right power levers to test Autofeathering of the right propeller.
11. Advance the left power lever to greater than 88% NG. Confirm that the ARMED light in the AUTOFEATHER switchlight does not illuminate.
12. Advance the right power lever to greater than 88% NG. Confirm that the ARMED light in the AUTOFEATHER switchlight illuminates.
13. Retard the left power lever to less than 88% NG. Confirm that the ARMED light in the AUTOFEATHER switchlight extinguishes.
14. Retard the right power lever to less than 88% NG. Confirm that the ARMED light in the AUTOFEATHER switchlight remains extinguished.
15. Depress the AUTOFEATHER switchlight and confirm that the SELECTED [SELECT] light in each switchlight extinguishes.

NOTE

The Autofeather system test must be done once each week.
Record completion of the test in the aircraft log book.

4.6.2 OVERSPEED GOVERNOR TEST

1. Power levers – IDLE
2. SYSTEM TEST – PROPELLER GOVERNOR switch – Lift and hold switch
3. Power levers – Advance until propellers govern at 70% NP +2 / –3%
4. Power levers – IDLE
5. SYSTEM TEST – PROPELLER GOVERNOR switch – Release switch

The overspeed governor check must be done once every 24 hours (once per flying day).

NOTE

Advance power levers slowly during overspeed governor test to avoid engine torque greater than 25 psi.

CAUTION

Ensure that the propeller governor test switch is not selected or released when either power lever is forward of idle.

4.6.3 BETA RANGE ANNUNCIATION TEST

1. PROP levers – MAX RPM
2. Left power lever – Retard until the BETA annunciation appears, then return to IDLE.
3. Right power lever – Retard until the BETA annunciation appears, then return to IDLE.
4. Confirm that the beta range annunciation appears no later than when each power lever has been moved one inch aft of the IDLE stop position.

4.6.4 RESET PROPS ANNUNCIATION TEST

1. Power levers – IDLE
2. Left PROP lever – Retard to MIN GOV. Check RESET PROPS annunciation appears.
3. Both PROP levers – MAX RPM. Check RESET PROPS annunciation disappears.

4.6.5 INTAKE DEFLECTORS TEST

1. Power levers – Set 80% NG
2. INTAKE DEFLECTOR switch – EXTEND, then RETRACT. Check appropriate A/I indications within engine window.

NOTE

When selecting EXTEND, the INTAKE DEFLECTOR switch should be held for 3 to 5 seconds after A/I is indicated. When selecting RETRACT, do NOT hold the switch after the two A/I annunciations have extinguished.

A minimum of 80% NG is required to extend the intake deflectors.

4.6.6 DE-ICING SYSTEM TESTS

1. Select VALVE HEAT switch ON
2. Select BOOTS AUTO switch to SLOW or FAST
3. Ensure BLEED AIR switches are OFF
4. Confirm PNEUMATIC LOW PRESS CAS message is present.
5. Power levers – Advance to idle NG + 15%
6. BLEED AIR – LEFT switch – ON. Check PNEUMATIC LOW PRESS CAS message disappears.
7. BLEED AIR – LEFT switch – OFF. Check PNEUMATIC LOW PRESS CAS message reappears after approximately 7 seconds.
8. BLEED AIR – RIGHT switch – ON. Check PNEUMATIC LOW PRESS CAS message disappears.
9. BLEED AIR – LEFT switch – ON
10. Select BOOTS AUTO switch to OFF/MANUAL, then return to SLOW or FAST
11. Confirm that the green LSTAB and RSTAB annunciations appear sequentially within 15 seconds.
12. BLEED AIR and BOOTS AUTO switches – as desired.
13. Power levers – Idle
14. Select PROP DE-ICE switch to ON and observe loadmeter fluctuation indicating propeller de-icing cycling. Select propeller de-ice switch as desired.
15. Check wing inspection lights.
16. Power lever – 75% NG
17. De-icing system BOOTS AUTO switch − OFF/MANUAL
18. BOOTS MANUAL – WING switch − Hold at WING INNER then WING OUTER and check that wing boots operate.
19. BOOTS MANUAL – STABILIZER switch – Hold at LEFT STAB then RIGHT STAB while ground crew verify that tailplane boots operate. Check that LEFT STAB and RIGHT STAB annunciations in the electrical system window each illuminate within two seconds of appropriate switch selection to LEFT STAB and RIGHT STAB, and each light goes out almost immediately switch is released to OFF. Operation of indicator lights should be consistent with each other.
20. BOOTS AUTO switch – FAST. A fast cycle takes 60 seconds which comprises 5 seconds inflation time for inner wings, 5 seconds for outer wings, 3 seconds for left stabilizer and 3 seconds for the right stabilizer followed by 44 seconds dwell period. A slow cycle takes 180 seconds. Inflation time for each boot remains the same; dwell time lasts 164 seconds.
21. Check that each stabilizer boot annunciation appears for at least 1 second in each 60 second cycle (or 180 second cycle), and at no time are both on simultaneously. If the LEFT indicator annunciation does not go out before the RIGHT comes on, a malfunction is indicated and rectification must be carried out before flight in icing conditions.
22. BOOTS AUTO switch − OFF/MANUAL
23. Flaps – Select 10 degrees, check LEFT STAB and RIGHT STAB DEICE PRESS lights illuminate within a 12 second period in a sequence of right, left, right, left stabilizer. Select greater than 15 degrees, check that another 12 second cycle consisting of two alternating 3 second inflations occurs for each stabilizer boot.

4.6.7 AFCS TESTS

The following checks must be done once per flying day (within a 24 hour period). For two-crew operations, the following checks apply to buttons on both control wheels.

<u>Electric Pitch Trim and AP DISC Interrupt check:</u>

1. Pitch Trim switch – NORMAL, confirm “AP 1 Fail” CAS message not present.
2. Control wheel trim selector – Hold UP or DN (both halves), confirm trim wheel travels appropriately.
3. AP DISC button – Press and hold, confirm trim wheel stops.
4. AP DISC button – RELEASE, confirm trim wheel travel resumes.
5. Pitch Trim switch – Select DISABLE, confirm that trim wheel stops and “AP 1 Fail” CAS message is displayed.
6. Control wheel trim selector – RELEASE
7. Pitch Trim switch – NORMAL, confirm “AP 1 Fail” CAS message disappears.

AP DISC check:

1. Flight Controller YD button – SELECT. Confirm only YD annunciation comes on.
2. YD Active – CONFIRM. Visually confirm YD displays on PFD and physically check rudder pedals for resistance.
3. AP DISC button – Press, confirm YD OFF.

FD check:

1. GA Button – Push, confirm FD activates into ROL and GA modes.
2. Select FD – OFF

4.7 TAXI

4.7.1 BEFORE TAXI CHECKLIST

The Before Taxi Checklist is to be accomplished in a challenge-response manner with the First Officer reading the checklist and the Captain responding.

BEFORE TAXI CHECKLIST (Challenge-Response)	
"Systems Checks"	**"Complete"** See SOP 4.6
"Take-Off Brief"	**"Complete"** Conduct takeoff briefing in accordance with SOP 3.7
"Transponder"	**"XXXX GND TA"** Ensure transponder code as received from ATC is correctly set and that the transponder is in STBY.
"FMS"	**"Confirmed / Activated"** FMS setup and activation should have been completed after engine start. Verify that FMS flight plan is activated.
"FMA/PFD"	As briefed (PF) FMA – HDG, coupled L/R, GA Alt Bug – ATC assigned/SID/DP altitude COM 1/2 – Brief frequency use NAV 1/2 – Departure NAVAIDs set NAV SEL – NAV source (FMS, VOR etc.) HDG Bug – Departure runway heading PFD OVRLY – Brief overlay selections
"Altimeters"	**XXXX L, C, R"** Verify that altimeters read proper altimeter setting/QNH is set on all three altimeters.
"Headings"	**"XXX° L, C, R"** Verify that displayed headings agree on pilot PFD, ESIS, and copilot PFD
"ESIS Alignment"	**"Complete"** Do not taxi aircraft while ESIS is aligning
"Flight Controls"	**"Checked"** Verify freedom and full travel of ailerons, elevator, and rudder
"Taxi Light"	**"On"**

4.7.2 TAXI PROCEDURES

1. Only the pilot occupying the left seat will taxi the aircraft.
2. The PF should signal to the ground crew readiness to taxi with hand signals or Taxi light as appropriate.
3. 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. The PM shall advise the PF whenever there is a hazard of collision. Both pilots must be heads up when crossing any taxiway or runway or while taxiing on a runway.
4. 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.
5. At taxi speeds the aircraft is to be steered primarily using coarse application of rudder and differential thrust/ reverse. The nose wheel steering lever can be used for larger turns or when maneuvering in apron areas during slow taxi speeds only (10 knots or less). Brakes should not be used for steering except at low speeds to increase the turning angle of the nose wheel. Acceleration and deceleration during taxiing should be planned so as to minimize wear on brakes.
6. 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
7. The PF will normally brief actual FMA/PFD selections/settings in sequence followed with “Briefed.”

4.7.3 TAXI CONSIDERATIONS

1. As soon as possible after beginning to taxi, the aircraft wheel brakes should be checked for proper operation.
2. Prior to taxiing on 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. This shall be communicated by each crewmember looking out their respective side and announcing “CLEAR LEFT/RIGHT.”
3. 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 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.
4. Strobe lights should be selected on when taxiing on or crossing a runway.

4.7.4 BEFORE TAKEOFF CHECKLIST

The Before Takeoff Checklist is to be accomplished in a challenge-response manner with the First Officer reading the checklist and the Captain responding.

The checklist is divided into two portions which are delineated by a horizontal line. The portion before the line can be accomplished at any point after the Before Taxi Checklist up to the runway hold short line. Checklist completion should be avoided when taxiing in congested areas or while on runways.

The portion of the checklist below the line is to be accomplished after being cleared for takeoff. Only when these items are complete shall the First Officer state “BEFORE TAKEOFF CHECKLIST COMPLETE” and a transfer of control be completed, if desired. The below the line portion of the checklist should be completed in an expeditious manner to avoid unreasonable delay on the runway after receiving a takeoff clearance.

BEFORE TAKE-OFF CHECKLIST (Challenge-Response)	
First Officer	**Captain**
"Flaps"	**"10 Set"** Verify flaps 10 are set and indicating green on the flap position indicator.
"Trims"	**"Set for Takeoff"** Verify elevator and rudder trim are in the green band and that aileron trim is centered.
"Auto-feather"	**"Selected"** Check that SELECTED light is illuminated.
"Environmental Switches"	As Required - **state switch selection(s)** BLEED AIR switches ON if ice protection or cabin heat is required, otherwise OFF.
"Surface De-Ice Switches"	As Required - **state switch selection(s)**
"Ice & Rain Switches"	As Required - **state switch selection(s)** Pitot heat should be selected on. Other items as required.
Note: FO will complete the Before Takeoff Checklist when taking the runway	
"External Lighting Switches"	As Required - **state switch selection(s)** Select strobe lights on.
"Internal Lighting Switches"	As Required - **state switch selection(s)**
"Friction Knobs"	As Required - **state switch selection(s)** Ensure that power lever and propeller lever friction knobs are set appropriately tight to prevent levers from sliding backward after takeoff.
"Nose Wheel"	**"Centered"** Verify that nose wheel steering lever is centered by observing alignment of index marks on steering lever and control column.
"CAS Messages"	**"Checked"** Takeoff is forbidden with any amber or red CAS messages present.
"Landing Lights"	**"On/TCAS"** Turn landing light on when cleared for take-off

WARNING

TAKEOFF IS PROHIBITED WITH ANY RED OR AMBER CAS MESSAGE PRESENT, EXCEPT WHEN A DEFECT HAS BEEN INVESTIGATED AND DEFERRED IN ACCORDANCE WITH THE PROCEDURES AND LIMITATIONS SET OUT IN THE MINIMUM EQUIPMENT LIST (MEL).

4.7.5 RNAV SID DEPARTURE (RNAV1) OpsSpec C063

These procedures are applicable for published RNAV SIDs using NAV lateral mode to fly the departure. Autopilot is recommended but not required.

1. RNAV SIDs and STARs must be loaded from a current navigation database, they may not be manually constructed ("built") on the WAYPOINTS page.
2. Manual modifications may be made as necessary to comply with ATC clearances (e.g., "direct to" routings).
3. For an RNAV SID, a flight director must be operative and the NAV roll mode must be used after takeoff.
4. Do not accept an RNAV SID clearance if:
    a. the runway position or lateral track depiction on the iNAV display is inaccurate.
    b. Amber DGRD displayed on the attitude indicator and/or UNABLE RNP displayed in the FMS message window.
    c. there is a loss of FMS or lateral navigation flight guidance mode (e.g., flight director and/or NAV mode inoperative).

Prior to Takeoff:

1. Verify proper runway and lateral track are depicted on the iNAV Display.
2. Verify from the FMS WAYPOINTS page that the RNAV waypoints and altitude constraints agree with those depicted on the Jeppesen chart and an active waypoint is depicted at the top of the WAYPOINTS list.
3. iNAV RANGE set from 1 to 5 nm to monitor cross track deviation on the iNAV map
4. HDG mode should be used for takeoff and passing 400 ft AGL, select NAV to capture the RNAV departure lateral track

Departure Change:

1. If there is a change in RNAV SID, RNAV SID transition, or departure runway, open FMW and deselect/reselect appropriate SID.
2. Following the modification, both pilots will verify proper runway and lateral track are depicted on the iNAV and verify from the FMS WAYPOINTS page that the RNAV waypoints and altitude constraints agree with those depicted on the Jeppesen chart and an active waypoint is depicted at the top of the WAYPOINTS list.

Additional Information:

RNAV 1 specifies a lateral containment of 1 nm left or right of course. Do not exceed 1 nm deviation from track without ATC clearance. For practical purposes, crews should strive for no more than 1/2 the RNAV value, or .5 nm maximum lateral deviation left or right of track.

At any time during the departure, if the aircraft is incapable of tracking the desired course, advise ATC and request a revised clearance.

The Apex system uses Estimated Position Uncertainty (EPU) instead of the commonly used equivalent, Actual Navigation Performance (ANP).

4.8 TAKE-OFF

Once the Before Takeoff Checklist is complete, and takeoff clearance has been received, takeoff can be initiated.

CREW COORDINATION - TAKEOFF		
PF	**Condition**	**PM**
Applies brakes, advances power levers to 85% NG, verifies that engine instruments are stable, releases brakes, **"SET POWER."**	–	–
–	Takeoff power set	Sets takeoff power, guards power levers in case of a rejected takeoff, calls **"POWER SET, AIRSPEED ALIVE, AUTOFEATHER ARMED."** See notes in section 4.8.2
–	75 knots	**"V1 - ROTATE"**
	Positive rate of climb indicated on VSI	**"POSITIVE RATE"**
–	–	–
	Passing 400 feet AGL	**"400 FEET"**
"Select HDG or **NAV, and SPD mode" (as required)**	–	–
–	–	Pushes HDG button or NAV button, Pushes SPD button and calls **"HDG** (or **NAV) and SPD selected"**
"FLAPS UP, SET CLIMB POWER, AFTER TAKEOFF CHECKLIST"	–	–
–	–	Selects flaps up, sets climb power, calls **"FLAPS UP, CLIMB POWER SET"** and completes the After Takeoff Checklist. See notes in section 4.8

4.8.2 AMPLIFIED TAKEOFF PROCEDURES

1. The PF will review initial Heading/Navigation and clearance altitude prior to take-off.

2. During the initial take-off roll, the PF will advance the power levers to approximately 85% Ng to allow the engines to stabilize and increase rudder effectiveness. In crosswind conditions, it may be necessary for the PF to use nose wheel steering initially to maintain directional control but only at speeds less than normal taxi speed. Use of the nose wheel steering tiller during the take-off roll beyond 10 kts (or running pace) is prohibited in normal operations. Maintaining directional control with large applications of rudder and/or slight asymmetric application of power is the correct technique. When asymmetric power is used for directional control, the levers must not be separated more than the width of the handle. After directional control is established with the rudder off the full travel limits, the levers should be smoothly brought forward to be matched.

3. Torque will increase due to ram airflow into the engines as airspeed increases during the takeoff roll. The PM should be prepared to make a small reduction in torque to avoid exceeding engine limitations. Awareness of this fact is important, as failure to recognize this can result in an unnecessary rejected takeoff due to an Engine Torque CAS warning message.

4. Once the engines have stabilized and the PF has sufficient directional control with the rudder, the PF will call for **"SET POWER."** The PM will set the power, cross check the (3) airspeed indicators, and confirm the Autofeather system is armed. The PF's hands will remain on the power levers until the decision speed (75 KIAS), at which time the PF will remove his hands from the power levers. The PM will ensure take-off power is maintained. After decision speed, the PF's first responsibility is control of the aircraft.

5. Avoid a rapid rotation rate. A standard 3º per second rotation rate (i.e: 3 seconds to achieve 10º nose up pitch) is ideal for comfort and to avoid over-rotation to excessive nose up attitudes.

6. Initial climb attitude is approximately 9 to 10 degrees nose up. 80 KIAS is maintained until 400 AGL (based on BARO Alt) or a safe altitude, whichever is higher. At this point, the PF will accelerate to the en-route climb speed (87 KIAS Vx/100 KIAS VY) and call for flaps 0. After the flaps are fully retracted, climb power can be set. Do not reduce power until the flaps are set to 0°. The PM will monitor the flap retraction sequence and call any abnormalities. The After Take-off Checklist is normally called in conjunction with climb power but may be delayed until time permits.

7. Bank angles greater than 15° should be avoided with flaps in transit.

8. The above points are NOT limitations, but recommendations for safe operation of the aircraft. Always consider your altitude, airspeed and configuration when maneuvering.

9. For maximum passenger comfort, 75% N_P may be used for climbs unless performance requirements dictate a higher power setting, such as 91% N_P or 96% N_P.

⚠ WARNING

IT IS MANDATORY TO SET FULL CALCULATED TAKEOFF POWER AS DERIVED FROM THE POWER SETTING GRAPH FOR EVERY TAKEOFF, REGARDLESS OF AIRCRAFT WEIGHT OR RUNWAY LENGTH. REDUCED POWER TAKEOFFS ARE PROHIBITED.

IT IS MANDATORY TO PAUSE FOR AT LEAST 5 SECONDS AT 85% NG PRIOR TO SETTING FULL CALCULATED TAKEOFF POWER.

CAUTION

When decreasing power from takeoff power to climb power, reduce engine torque before reducing propeller RPM. If accomplished in the reverse order, torque limits will be exceeded.

4.8.3 AFTER TAKEOFF CHECKLIST

The After Takeoff Checklist shall be accomplished after flaps have been retracted and climb power has been set. Under no circumstances should any of these actions be initiated before reaching at least 400 feet above ground level.

The After Takeoff Checklist shall be accomplished aloud by the PM in a read and do manner.

AFTER TAKEOFF CHECKLIST (Read and Do)	
Switch / Lever / Unit	**PM**
"Flaps"	**"Up"**
"Landing/Taxi Lights"	As Required **- state switch position** Both lights would normally be set to OFF. PULSE switch can be set to TCAS or PULSE as required.
"Nose Wheel"	**"Centered"** Align with index marks if required, then apply a slight up-ward and downward pressure to the nose wheel steering lever to confirm that the nose wheel is locked in the center position.
"Transponder"	**"TA/RA"** Confirm that transponder has automatically transitioned from GND mode to TA/RA mode.
"Vent Fan"	**"Off"** Verify that VENT FAN switch is OFF and that Vent Fan On CAS message is not displayed.
"Auto Feather"	**"Off"** Verify that SELECTED and ARMED lights are out.

4.9 REJECTED TAKEOFF (RTO)

The time available to decide to continue or to reject is very brief. In many cases there is only sufficient time to direct that a reject is to occur. There is likely insufficient time for a discussion that includes a description of the malfunction. Many reject situations do not become apparent until the aircraft speed is very near V1. Any delay in commencing a reject before V1 may result in the aircraft becoming airborne.

Either pilot may callout the problem and make the decision to reject. A takeoff shall be rejected if the aircraft speed has not exceeded V1 and a situation develops that the safety of the aircraft would be jeopardized if the flight is continued. For situations at or below V1 where the safety of the aircraft is not jeopardized by continuing the takeoff, the Captain may elect to continue if he/she feels it is safer to do so (e.g: inadvertent torque exceedance causing spurious Engine Torque CAS message); however, it is important to emphasize that any reject call should normally be honored.

Items classified as affecting safety necessitating a rejected take-off up to V1, but not limited to these items only:

1. Engine-failures (including incorrect engine indications)
2. FCU runaway (affected engine will produce uncontrollable maximum power)
3. Lack of engine power (less than dictated by AFM performance charts)
4. Fire indications (both airframe and engines)
5. Flight control malfunctions
6. Tire or wheel failures/loss of directional control
7. Primary flight instrument failures
8. Any Master Caution of Master Warning annunciation
9. Obstructed runway
10. Major internal cockpit smoke
11. Abnormalities deemed to immediately affect flight safety should the take-off be continued.

CAUTION

For emergency situations where the speed is in excess of V1/VR and the aircraft is already airborne, in most cases the safest course of action is to continue the take-off and deal with the situation in flight. Runway overrun is possible where rejected takeoffs are commenced at speeds above V1/VR. If it is necessary to conduct an airborne reject no procedure is specified, however it is recommended that the power levers be reduced to idle and a landing be made straight ahead on the remaining runway. This is an extra-ordinary procedure to be used only in the event that the Captain believes the aircraft cannot safely climb due to aircraft weight, density altitude, etc.

4.9.1 CREW COORDINATION

The following procedure outlines the entire Rejected Takeoff procedure from the beginning of the takeoff.

CREW COORDINATION – REJECTED TAKEOFF (RTO)		
PF	**Condition**	**PM**
Applies brakes, advances power levers to 85% Ng, and then releases brakes. **“SET POWER”**	Aircraft on threshold, cleared for takeoff.	**–**
–	Take-off Power Set	Guards power levers in case of reject, sets takeoff power, responds: **“POWER SET, AIRSPEED ALIVE, AUTOFEATHER ARMED”**
	Malfunction identified by either crew member prior to V1	
Either pilot calls **“REJECT”**		
Immediately moves power levers to idle and applies braking as required. Use of reverse thrust is not recommended for RTO with engine failure.	**–**	Advises ATC: **“(MARITIME 600) REJECTING ON THE RUNWAY”**
Sets parking brake. **“PARKING BRAKE SET.”** PA to passengers: **“PASSENGERS REMAIN SEATED”**	Aircraft stopped	Assesses the problem and obtains the appropriate QRH checklist.
The crew will assess the severity of the situation and complete any appropriate memory items and QRH procedures.		

5 – CRUISE

5.1 INTRODUCTION

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

5.2 GENERAL

1. Airspeed – Allow aircraft to accelerate in level flight to desired cruise speed.
2. Power – Reduce to cruise power setting. Lower power settings than maximum calculated cruise power may be selected if desired.
3. Fuel – Manage as required.
4. Select VNAV when level at final cruising altitude. Prior to selecting VNAV, ensure that FMS waypoint list contains a valid TOD waypoint.

5.3 CREW COORDINATION

Upon leveling at cruise altitude, the following callouts shall be used.

CREW COORDINATION – LEVEL OFF		
PF	**Condition**	**PM**
"CRUISE POWER"	Level at cruise altitude	**–**
–	**–**	Sets cruise power, states **"CRUISE POWER SET."** See Note 1 below
"SELECT VNAV" (If desired / appropriate / required)	**–**	**–**
–	**–**	Selects VNAV on the flight control panel, states **"VNAV SELECTED."**
Note 1: PF may request a specific power at this point (e.g: 40-45 psi torque and 75% Np)		

5.4 IFR CLASS I AND II AIRSPACE NAVIGATION USING AREA NAVIGATION SYSTEMS

MHI is authorized to conduct Precision RNAV (P-RNAV) and/or Basic RNAV (B-RNAV)/RNAV 5 operations in terminal and/or en route areas (Class I) referenced in the operations specifications B050. The navigation system shall be fully operational or operating in accordance with the approved MEL, when the system is used for any navigation.

MHI is authorized to conduct Oceanic and Remote Continental (Class II) navigation using Multiple Long-Range Navigation Systems (M-LRNS) within the areas of enroute operation where this paragraph is referenced in operations specifications B050. The navigation system is equipped with two independent GPS navigation systems that meet RNP-4 and RNP-10 performance criteria.

The following procedures should be adhered to when degraded navigation capabilities and/or satellite system outages exist:

1. Single GPS Failure. Receiver displays a loss of navigation function alert, the pilot may continue to destination using the other GPS receiver.
2. Dual GPS Failure. Both GPS receivers display a loss of navigation function alert, the pilot should immediately begin using dead reckoning procedures until GPS navigation is restored.
3. Operations below the MEA and/or IAW SFAR No.97. Either GPS receivers display a loss of navigation function alert, the pilot should immediately coordinate with ATC for a climb to the MEA or higher to enable the use of ground based navigational facilities.
4. Any degradation in GPS navigation capability will be reported to ATC as soon as possible in accordance with Part 91.187.

6 – ARRIVAL

6.1 INTRODUCTION

This chapter of SOP 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.

6.2 GENERAL

1. The PM may need to advise the passengers prior to descent and brief them on the arrival conditions.
2. VNAV profiles should be flown using the FMS profiles. The maximum normal descent rate is 1000 fpm.
3. Cold temperature corrections should be completed prior to commencing an approach. This can be accomplished with the FMS TComp function.
4. The approach briefing should be completed in cruise prior to the Top of Descent. Prior to Top of Descent the PM will obtain and record ATIS (WX) advise the PF of the current weather and active runway.
5. The PM will then program the FMS for the arrival and approach procedure, tune the applicable nav-aids, and set up the PFDs, confirming all entries with the PF prior to activation.
6. Once avionics setup is complete, the PF will conduct an approach briefing.
7. Once the approach briefing is complete the PF will call for the Descent Checklist.

6.3 APPROACH PLANNING AND SETUP

ATIS	Obtain the current weather and altimeter or ATIS prior to descent. Cold weather corrections should be made if necessary to all procedure altitudes by enabling the FMS TComp function. ATC should be advised of any corrections to PT or MA altitudes. Do not apply cold weather corrections to ATC assigned altitudes, unless operating in a region where ATC does not provide temperature-corrected altitudes.
Build	1) Load STAR and Approach procedure from FMS database 2) (ILS/LOC only) Tune NAV 1 and Tune NAV 2. 3) (ILS/LOC only) Select NAV PREVIEW pointers on left and right PFD to LOC1 and LOC2, respectively. Ensure NAV PREVIEW course is set to final approach course.
Bug	Set landing V speeds (speed bugs) in the Flight Management Window arrival tab. Minimums bug, if required.
Brief	Review and brief STAR or descent restrictions and routings for descent. Review approach procedure, landing flaps, reference speeds, and missed approach procedures using standard approach briefing format. Cross check STAR and Approach chart waypoints against those loaded in the FMS and resolve any discontinuities in the FMS flight plan, if present.
Checklist	Conduct the Descent and Approach Checklist.

6.4 APPROACH BRIEFING

NOTE: IMC approach briefings should follow the “Jeppesen Briefing Strip” as a minimum.

1. Airport/Runway/Landing Distance (if required)
2. Weather (ATIS, AWOS, FSS etc.)
3. Arrival method (STAR, radar vectors, procedure turn, DME arc, direct to, VFR etc.)
4. Instrument Approach: (Build, Bug, Brief; see paragraph 6.3)
    a. NAVAID frequencies/WAAS Channel (if applicable)
    b. Final approach course
    c. FAF crossing and stepdown altitudes
    d. DDA/DA/DH or MDA
    e. TDZE
    f. MAP/Go-Around Procedures
    g. Special considerations/instructions (TComp, climb gradients, restrictions etc.)
5. Terrain/Obstacles
6. Flap Setting/Speeds
7. Crew Coordination (callouts, stabilized approach criteria etc.)
8. Ground Operations/Taxi plan
9. Emergency Procedures (if required)

CAUTION

In case of disagreement between the published approach information and FMS displayed information, crews must follow published approach information.

6.5 DESCENT AND APPROACH CHECKLIST

The Descent and Approach checklist will be initiated by the PF prior to top of descent after all approach preparations have been made and the approach has been briefed. It is accomplished in a read and do manner by the PM.

DESCENT AND APPROACH CHECKLIST (Read and Do)	
PM	**PF**
"Landing/Taxi Lights"	As Required **- states switch position(s)**
"Altimeters"	**"XXXX Set L, C, R"**
"Fuel Selector"	**"Normal"**
"Internal Lighting Switches"	As Required **- states switch position(s)**
"Nose Wheel"	**"Centered"** Align with index marks if required, then apply a slight up-ward and downward pressure to the nose wheel steering lever to confirm that the nose wheel is locked in the center position.
"CAS Messages"	**"Checked"**
"Approach Brief"	**"Complete"** See SOP 6.4

NOTE

Do not select Autofeather on for approach and landing. This may cause uncommanded propeller feathering in the event that power is applied rapidly during a go-around.

6.6 HOLDING PROCEDURES

6.6.1 AIRCRAFT CONFIGURATION

Depending on the circumstances with expected length of hold, normal holding speed of 120 knots should be maintained with the wing flaps retracted.

If a hold enroute can be anticipated, consideration should be given to reducing power to a lower setting, but not below maximum range power. This will reduce fuel consumption.

A speed above 1.3 x Vs for flap angle should be maintained. If the aircraft is unable to maintain minimum speed while in icing conditions, consideration should be given to alternate airports or altitudes.

CAUTION

Low airspeeds in icing conditions will allow ice to build aft of the de-ice boot on the bottom of the wing. Consider the selection of de-ice boots to FAST mode if a hold in icing conditions cannot be avoided.

6.6.2 NAVIGATION

Unless circumstances dictate otherwise, holds shall be conducted with the use of the FMS Hold function accessible through the Hold dialog box on the FMS waypoint list or INAV map. This allows holds to be conducted coupled to the flight director and autopilot and maximizes situational awareness.

6.6.3 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 the 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.

6.6.4 CREW COORDINATION

A Hold Briefing shall be given in order to ensure both pilots are perfectly clear on the procedure. The Hold Briefing will consist of the following items:

1. Entry procedure (direct, parallel, or teardrop)
2. IAS and altitude (The FMS suggests a holding speed based on an internal performance database)
3. Fuel (how many minutes of holding time are available and what minimum diversion fuel requirement is)

6.7 AFCS MODE SELECTIONS FOR APPROACH

The following table shows the recommended Flight Director mode selections to be made for various types of instrument approach procedures. This table refers to the actual mode (button) to be selected on the Flight Control Panel. Proper mode selection must always be confirmed with the applicable annunciations on the FMA.

In cases of approaches with vertical guidance (ILS or FMS based), a single selection of the APR button will arm both lateral and vertical modes simultaneously. In cases of approaches without vertical guidance (LOC, raw data VOR and NDB approaches, etc.), two selections are necessary, one for the lateral mode (e.g. NAV), and another for the vertical mode (e.g. VS).

AFCS MODE SELECTIONS FOR INSTRUMENT APPROACHES			
Approach	**Conditions Required for Use of FMS Navigation**	**Lateral Mode for Approach**	**Vertical Mode for Approach**
ILS	Navigation using FMS source until intercepting final approach course, then transition to localizer source.	APR	APR
LOC (no GS)		NAV	VS
RNAV/GPS/GNSS	LPV, LNAV/VNAV, LNAV minima available	APR	APR
VOR, VOR-DME	Approved GNSS/GPS overlay approaches	APR	APR (FMS), VS (Raw Data)
NDB, NDB-DME	Approved GNSS/GPS overlay approaches	APR (FMS), HDG (Raw Data)	APR (FMS), VS (Raw Data)

Note 1: For circling minima, do not use APR mode, otherwise the aircraft will not level at MDA. Use NAV and VNAV/VS modes for lateral and vertical guidance, respectively.
Note 2: If APR mode is used for LOC approach, FMA may display a spurious GS armed annunciation and may unintentionally capture a glideslope.
Note 3: NAV mode will only sequence from FMS to LOC navigation source on the coupled side FD.
Note 4: APR mode permits a descent below the altitude set in the altitude preselect (open descent) and will not level at MDA/DH.

6.8 DERIVED DECISION ALTITUDES (DDA)

Unless authorized otherwise, flight crews must be mindful to add an appropriate altitude margin to MDA if using it as a DA during an approach. This accounts for any altitude loss during the initial phase of a go-around. Convention is to add 50 feet. Adding this margin to MDA produces a Derived Decision Altitude (DDA). For approaches with a published DA (i.e. ILS, LNAV/VNAV and LPV minima), no adjustment to DA is necessary.

6.9 PRECISION APPROACHES

6.9.1 GENERAL

Precision approaches consist of ILS and LPV approaches. The following information covers ILS approaches only, at this time.

6.9.2 CREW COORDINATION

CREW COORDINATION – PRECISION APPROACH		
PF	**Condition**	**PM**
"SELECT APR"	On radar vectors to final or RNAV transition, within 105º of the final approach course. Approach clearance received.	–
–	–	Selects APR on AFCS, and verifies FMA LOC and GS is armed
Verifies FMA LOC and GS armed	FMA displays LOC and GS armed	–
	Positive movement of localizer	**"LOCALIZER ALIVE"**
"LOC CAPTURE, SET RUNWAY HEADING"	FMA transitions to LOC active mode	–
–	–	Sets heading bug to final approach course
Verifies HDG is set	Positive movement of glideslope	**"GLIDESLOPE ALIVE"**
"GS CAPTURE, SET MISSED APPROACH ALTITUDE"	FMA transitions to GS active mode	–
–	–	Sets missed approach altitude in altitude preselect, responds **"MISSED APPROACH ALTITUDE SET"**
Verifies altitude is set	–	–
Slows aircraft to 100 knots	2 nm prior to FAF	–

CREW COORDINATION – PRECISION APPROACH *continued*		
PF	**Condition**	**PM**
"FLAPS 10, PROPS MAX RPM, LANDING CHECKLIST"	Normally 1 nm prior to FAF but no later than 1,000 ft AGL or 500 ft above minimums whichever is higher	–
–	–	Selects Flaps 10 and sets propeller levers to max RPM, responds **"FLAPS 10 SET, PROPS MAX RPM, LANDING CHECKLIST COMPLETE"**
Slows to 90 knots	–	–
–	Crossing FAF	Verifies that altitude matches the FAF crossing altitude on the approach chart, and that the baro minimums are set, calls **"(FAF NAME), (CROSSING ALTITUDE), MINIMUMS (DA) SET"**
Visually confirm altitude set	–	–
–	100 feet above MDA	**"100 ABOVE"**
Acknowledge	–	–
–	**"MINIMUMS"** auto call-out	–
"LANDING" or "GO AROUND"	–	–
–	When landing assured	–
Transitions to Vref	–	–

6.9.3 AMPLIFIED PROCEDURES

1. Procedure turns (if required) will be flown at 120 knots with the Flaps 0 unless conditions dictate otherwise. In such cases a special briefing must be completed.
2. VAPP is 90 knots with flap 10º until transition to VREF.
3. The missed approach altitude shall be set in the altitude selector no later than upon interception of the GS.
4. Flaps 10 is the standard configuration for instrument approaches; however, if landing distance is a factor, flaps 20 may be used provided the aircraft is stabilized prior to 1000 ft AGL or 500 ft above minimums whichever is higher. This avoids configuration changes at low altitude and meets the stabilized approach criteria. Flaps 10 for landing shall be briefed as part of the approach briefing and the FLAP OVRD selected.
5. The "RUNWAY IN SIGHT" call may be made at any point during the approach. Once the "RUNWAY IN SIGHT" call has been made and acknowledged, the PM can revert to visual approach calls.
6. If during the approach, prior to a "RUNWAY IN SIGHT" or "LANDING" call, the localizer or glideslope fails or de-grades, the missed approach procedure must be initiated immediately.
7. In the event of a missed approach prior to the missed approach point, the aircraft shall be climbed to the missed approach altitude while following the prescribed approach track to the MAP and then by following the missed approach procedure to the MAWP.
8. PF may delay setting flaps to 10º, Props to Max RPM and slowing to VAPP after the FAF; however, it must be completed no later than 1000 ft AGL or 500 ft above minimums (whichever is higher) to meet the stabilized approach criteria.

6.10 LNAV/VNAV, LPV AND LNAV APPROACHES

6.10.1 GENERAL

LNAV/VNAV and LPV approaches consist of RNAV/GNSS/GPS, VOR overlay, and NDB overlay approaches with FMS provided vertical guidance.

Prior to commencing the approach briefing, the PM must

1. Retrieve the RNAV approach from the database (flight crews shall not manually enter the approach waypoints into the flight plan);

2. RAIM monitoring is done automatically with the phase 2 avionics upgrade. A CAS message will be generated if RAIM exceeds the limit for the approach. During LPV approaches a WAAS channel ID will be present below the altitude tape on the PFD which should be verified before initiating the approach;

3. If LPV UNVL is displayed during an LPV approach the pilot must revert to LNAV/VNAV minima. NAV PREVIEW is not available during LPV approaches and will generate a LPV UNVL message if inadvertently selected. If the LPV UNVL message disappears when the NAV PREVIEW button is pushed then you may continue to LPV minima;

4. Verify approach waypoints by ensuring that bearings and distances between waypoints are consistent with current charted data and that charted altitude constraints match those in the FMS.

6.10.2 CREW COORDINATION

CREW COORDINATION – LNAV/VNAV, LPV AND LNAV APPROACH		
PF	**Condition**	**PM**
"SELECT APR"	On radar vectors to final or RNAV transition and within 105º of final approach course. Approach clearance received.	–
		Selects APR on AFCS and verifies FMA NAV and VGP is armed
Verifies FMA NAV and VGP is armed	FMA displays NAV and VGP armed	–
–	If on radar vectors to final, positive movement of CDI	**"COURSE ALIVE"**
"NAV CAPTURE, SET RUNWAY HEADING"	If on radar vectors to final, FMA transitions to NAV active mode.	–
–	–	Sets heading bug to final approach course
Verifies HDG is set	If intercepting glide path from below, positive movement of vertical deviation pointer	**"GLIDEPATH ALIVE"**
"VGP CAPTURE, SET MISSED APPROACH ALTITUDE"	FMA transitions to VGP active mode	Sets missed approach altitude in altitude selector, responds **"MISSED APPROACH ALTITUDE SET"**
Verifies altitude set	–	–

CREW COORDINATION – LNAV/VNAV, LPV AND LNAV APPROACH *continued*		
PF	**Condition**	**PM**
Slows aircraft to 100 knots	2 nm prior to FAF	Verifies that green **APP** annunciation is presented on the PFD
"FLAPS 10, PROPS MAX RPM, LANDING CHECKLIST"	Normally 1 nm prior to FAF but no later than 1,000 ft AGL or 500 ft above minimums whichever is higher	–
–	–	Selects Flaps 10 and sets propeller levers to max RPM, responds **"FLAPS 10 SET, PROPS MAX RPM, LANDING CHECKLIST COMPLETE"**
Slows to 90 knots	–	–
–	Crossing FAF	Verifies that altitude matches the FAF crossing altitude on the approach chart, and that the baro minimums are set, calls **"(FAF NAME), (CROSSING ALTITUDE), MINIMUMS (DA) SET"**
Visually confirm DA/DDA altitude set	–	–
	100 feet above DA/DDA	**"100 ABOVE"**
Acknowledge	–	–
"LANDING" or "GO AROUND"	**"MINIMUMS"** auto call-out	–
–	When landing assured	–
Transitions to Vref	–	–

6.10.3 AMPLIFIED PROCEDURES

1. VAPP is 90 knots with flap 10º until transition to VREF.

2. The missed approach altitude shall be set in the altitude selector no later than upon interception of the vertical glidepath.

3. Flaps 10 is the standard configuration for instrument approaches; however, if landing distance is a factor, flaps 20 may be used provided the aircraft is stabilized prior to 1000 ft AGL or 500 ft above minimums whichever is higher. This avoids configuration changes at low altitude and meets the stabilized approach criteria. Flaps 10 for landing shall be briefed as part of the approach briefing and the FLAP OVRD selected.

5. The **"RUNWAY IN SIGHT"** call may be made at any point during the approach. Once the "RUNWAY IN SIGHT" call has been made and acknowledged, the PM can revert to visual approach calls

6. If during the approach, prior to a "RUNWAY IN SIGHT" or "LANDING" call, there is a loss of GPS integrity or RAIM availability, the missed approach procedure must be initiated immediately. Crews should give consideration to alternate missed approach procedures in the event of a loss of GPS integrity.

7. If the green "APP" annunciation does not appear on the PFD prior to crossing the FAF, or disappears at any point after the FAF, a missed approach procedure must be initiated immediately.

8. In the event of a missed approach prior to the missed approach point, the aircraft shall be climbed to the missed approach altitude while following the prescribed approach track to the MAP and then by following the missed approach procedure to the MAWP.

6.10.3 AMPLIFIED PROCEDURES - *continued*

9. Barometric VNAV information is advisory only and caution must be exercised when flying LNAV/VNAV approaches to ensure that all altitude constraints are respected.

10. PF may delay setting flaps to 10º, propellers to Max RPM and slowing to VAPP after the FAF; however, it must be completed no later than 1000 ft AGL or 500 ft above minimums (whichever is higher) to meet the stabilized approach criteria.

6.11 NON-PRECISION APPROACH – SCDA (WITHOUT FMS VERTICAL GUIDANCE)

6.11.1 GENERAL

Stabilized Constant Descent Angle (SCDA) procedures are used during non-precision approaches with straight-in landing minima and result in a constant vertical flight path from the final approach fix to the touchdown point on the runway. The purpose of establishing a constant descent to the runway is to decrease workload, and to increase safety as the aircraft is already in an optimal descent for landing upon reaching the minimum descent altitude. The MDA can be considered a Decision Altitude (DA) and the aircraft does not level-off at DA; however, 50 ft should be added to the MDA so that the aircraft does not dip below the MDA during a MAP/Go-Around. A missed approach must be commenced if the required visual reference is not obtained at or above the Derived Decision Altitude (DDA).

SCDA type non-precision approaches consist of LOC (no GS), LOC-DME, LNAV, and other non-precision approaches **without FMS provided vertical guidance**.

6.11.2 SCDA DESCENT RATE

Prior to the approach, use the following procedure to calculate the SCDA descent rate:

1. Determine the applicable ground speed for the approach (90 knots under normal circumstances)

2. Reference the approach chart to determine the required rate of descent.

During the approach, initiate the SCDA procedure as follows:

1. Plan descent to cross the FAF at the VDA altitude or to leave the procedure turn altitude at the recommended descent point.

2. Select the (DDA) Derived Decision Altitude (MDA + 50 ft) on the altitude selector.

3. Just prior to reaching the FAF or descent point (0.2 nm prior), select VS mode and the required vertical speed (to the closest 100 foot increment).

4. At the DA or DDA, should the required visual reference be obtained, continue for landing at the same rate of descent. Should the required visual reference not be obtained, commence the vertical portion of the missed approach (do not level-off) and set the missed approach altitude in the altitude selector.

6. In the event of a missed approach, at the missed approach point, commence the horizontal/navigation portion of the missed approach.

6.11.3 CREW COORDINATION

CREW COORDINATION – SCDA NON-PRECISION APPROACH		
PF	**Condition**	**PM**
"SELECT NAV"	Approach clearance received	–
–	–	Selects NAV on AFCS and verifies FMA LOC or NAV is armed
Verifies FMA LOC or NAV is armed	FMA displays LOC or NAV armed, as appropriate	–
–	If on radar vectors to final, positive movement of CDI	**"LOCALIZER/COURSE ALIVE"**
"LOC/NAV CAPTURE, SET RUNWAY HEADING"	If on radar vectors to final, FMA transitions to LOC/NAV active mode	–
–	–	Sets heading bug to final approach course, responds: **"RUNWAY HDG SET"**
–	Aircraft established at FAF crossing height or procedure turn height.	–
Slows aircraft to 100 knots	2 nm prior to FAF or Descent Point	–
"FLAPS 10, PROPS MAX RPM, LANDING CHECKLIST"	Normally 1 nm prior to FAF but no later than 1,000 ft AGL or 500 ft above minimums whichever is higher	–
–	–	Selects Flaps 10 and sets propeller levers to max RPM, responds **"FLAPS 10 SET, PROPS MAX RPM, LANDING CHECKLIST COMPLETE"**
Slows to 90 knots	–	–
"SELECT VS, SET (CALCULATED VERTICAL SPEED) FPM"	0.2 nm prior to FAF or Descent Point	–
–	–	Selects VS mode, adjusts descent rate with NOSE DN button, responds **"VS SELECTED, (CALCULATED VS) FPM SET"**
	Crossing FAF	Verifies that altitude matches the FAF crossing altitude on the approach chart, and that the baro minimums are set, calls **"(FAF NAME), (CROSSING ALTITUDE), MINIMUMS (DA) SET"**

CREW COORDINATION – SCDA NON-PRECISION APPROACH *continued*		
PF	**Condition**	**PM**
Verifies altitude set	–	–
	100 feet above DA/DDA	**"100 ABOVE"**
Acknowledge	–	–
"LANDING" or "GO AROUND"	**"MINIMUMS"** auto call-out	–
–	When landing assured	–
Transitions to Vref	–	–

6.11.4 AMPLIFIED PROCEDURES

1. VAPP is 90 knots until transition to Vref.

2. In the event of a missed approach, the missed approach altitude should be set as soon as possible after the go around is initiated.

3. Flaps 10 is the standard configuration for instrument approaches; however, if landing distance is a factor, flaps 20 may be used provided the aircraft is stabilized prior to 1000 ft AGL or 500 ft above minimums whichever is higher. This avoids configuration changes at low altitude and meets the stabilized approach criteria. Flaps 10 for landing shall be briefed as part of the approach briefing and the FLAP OVRD selected.

4. The "RUNWAY IN SIGHT" call may be made at any point during the approach. Once the "RUNWAY IN SIGHT" call has been made and acknowledged, the PM can revert to visual approach calls.

5. If during an LNAV only approach, prior to a "RUNWAY IN SIGHT" or "LANDING" call, there is a loss of GPS integrity or RAIM availability, the missed approach procedure must be initiated immediately. Crews should give consideration to alternate missed approach procedures in the event of a loss of GPS integrity.

6. During an LNAV only approach, if the green "APPR" annunciation does not appear on the PFD prior to crossing the FAF, or disappears at any point after the FAF, a missed approach procedure must be initiated immediately.

7. In the event of a missed approach prior to the missed approach point, the aircraft shall be climbed to the missed approach altitude while following the prescribed approach track to the MAP and then by following the missed approach procedure to the MAWP.

8. LOC (no GS) approaches, must be flown in NAV and VS modes (not APR mode). This avoids a nuisance GS armed annunciation on the FMA and the potential for the flight director to capture a false or unreliable glideslope signal.

9. A high degree of crew vigilance is required during this procedure to ensure that the aircraft does not descend below any minimum step-down altitudes. Continual cross check of distance and altitude is required, and the vertical descent rate should be adjusted accordingly for variations in ground speed due to headwind/tailwind conditions.

10. PF may delay setting flaps to 10º, propellers to Max RPM and slowing to VAPP after the FAF; however, it must be completed no later than 1000 ft AGL or 500 ft above minimums (whichever is higher) to meet the stabilized approach criteria.

6.12 CIRCLING APPROACHES

6.12.1 GENERAL

Circling may be required when straight-in minimums are not published, when the approach flown does not serve the runway of intended landing, or when an inspection of the runway is advisable. The following points apply to all circling procedures:

1. The Captain and First Officer must have satisfactorily completed the MHI Fixed-Wing Pilot Training Curriculum and satisfactorily completed a flight check including a circling maneuver.
2. When conducting an instrument approach procedure which requires a circling maneuver to the runway of intended landing, MHI shall not use a landing minimum lower than the minimum prescribed for the applicable circling maneuver or a landing minimum lower than specified in paragraph 6.12.3 below, whichever is higher.
3. The lowest authorized IFR landing minimum for instrument approaches, which require a circling maneuver to the runway of intended landing, shall be determined for a particular aircraft by using the speed category appropriate in the table listed in paragraph 6.12.3 to the highest speed used during the circling maneuver.
4. SCDA procedures may be flown for circling approaches by calculating a descent rate during the final approach course so that the aircraft is flown at a constant descent rate from the FAF to the MDA (+ 50 ft) which ensures arrival at or above the circling MDA.
5. Visual contact with the aerodrome shall be maintained by at least one of the pilots throughout the circling maneuver.
6. If visual contact with the aerodrome is lost, a missed approach shall be executed.
7. The aircraft will normally be flown using Category A circling MDA until in a position to commence a normal descent and landing (consider using Category B circling MDA at night).
8. No more than 30° of bank shall be used during the circling maneuver.
9. The aircraft should be stable/wings level on final before the aircraft reaches 300 feet above airport elevation.

6.12.2 AIRCRAFT CONFIGURATION

The recommended configuration for circling until the aircraft commences the final descent for landing is Flap 10, and 90 KIAS. For information on landing see the Landing Procedures section later in this chapter.

1. This speed puts the aircraft in Category A Minima to be used for the MDA.
2. In turbulent air, consideration should be given to adjusting the approach speed.

6.12.3 CIRCLING LANDING MINIMUMS

CIRCLING LANDING MINIMUMS		
Speed Category	**HAA**	**Visibility in Statute Miles**
A: Less than 91 KTS	350	1
B: 91 to 120 KTS	450	1
C: 121 to 140 KTS	450	1 ½

6.12.4 CREW COORDINATION

CREW COORDINATION – CIRCLING APPROACH		
PF	**Condition**	**PM**
	MDA, runway in sight	**"RUNWAY IN SIGHT"**
"CIRCLING LEFT/RIGHT," maintains 90 KIAS	**–**	**–**
–	**–**	**–**
"FLAPS 10/20/37, LANDING CHECKLIST" (as required)	Landing assured	**–**
–	**–**	Selects flaps as requested, **"FLAPS 10/20/37 SET, LANDING CHECKLIST COMPLETE"**
Transitions to Vref	**–**	**–**

6.13.5 AMPLIFIED PROCEDURES

1. It is required to keep the runway is sight after initial visual contact and remain at the circling MDA until a normal landing is assured.

2. Circling may be done at an altitude greater than the Circling MDA if able.

3. Aerodrome on PF side: The PM is responsible for monitoring aircraft instruments and calling out deviations.

4. Aerodrome on PM side: The PF will fly the aircraft with visual reference and monitoring of the instruments and when necessary request guidance from the PM for positioning the aircraft on final approach.

6.13 VISUAL APPROACHES

6.13.1 GENERAL

For guidance on aircraft configuration and completion of checks, Visual Approaches and VFR patterns are treated as variations of the same type of procedure.

1. The Descent and Approach Checklist is completed prior to descent, except during multiple patterns, when it is completed on the downwind leg. When on final, the Landing Checklist should be completed.

2. On contact and visual approaches, the aircraft should be configured so as to turn onto final approach with Flaps 10.

3. On final and no later than 500 AGL, select landing flap and complete Landing Checklist.

4. When landing is assured on final, flaps full may be selected, the aircraft slowed to Vref over the end of the runway for landing.

5. During icing conditions or in turbulent air, consideration should be given to increasing the approach speeds.

6.13.2 NAVIGATION

Navigation during visual procedures is, by definition, primarily by visual means. However, it is often advantageous to use other available NAVAIDS. If the Contact or Visual Approach is to be completed to a runway with a straight-in instrument approach, the Navigation Aids for the instrument approach should be selected on the aircraft's navigation radios.

6.13.3 CREW COORDINATION

CREW COORDINATION – VISUAL APPROACH		
PF	**Condition**	**PM**
"DESCENT AND APPROACH CHECKLIST"	Prior to TOD	–
–	–	Completes Descent and Approach Checklist, responds: **"DESCENT AND APPROACH CHECKLIST COMPLETE."**
Slows aircraft to 120 KIAS	Established on downwind leg at pattern altitude	–
Slows aircraft to 90 KIAS, in flap speed range, **"FLAPS 10, PROPS MAX RPM"**	Abeam threshold of intended runway of landing	–
–	–	Selects flaps 10 and sets props max RPM, responds **"FLAPS 10 SET, PROPS MAX RPM"**
"FLAPS 20/37, LANDING CHECKLIST" (as required)	Landing assured (final flaps)	–
–	–	Selects flaps 20 or 37 (as required), responds **"FLAPS 20/37 SET, LANDING CHECKLIST COMPLETE"**
Transitions to Vref	–	–

6.13.4 AMPLIFIED PROCEDURES

1. Flaps 20° is the normal configuration for visual landings; however if flaps 10 is used for landing, it will be briefed as part of the approach briefing and the FLAP OVRD selected.

2. If desired or required Flap 37 is available as landing flap. Flap 37 shall be selected no later than 500 AGL. When Flap 37 is used the Landing Checklist will be called for after the selection of Flap 37.

3. Flap 20 may be used to aid in maneuvering on base leg, if desired.

6.14 STABILIZED APPROACH CRITERIA

Significant changes in speed, pitch, bank and configuration during an approach can seriously degrade situational awareness and complicate proper actions at the decision point. The following criteria are those that are required to meet the definition of a stabilized approach. If at any time a crew member feels that an approach has become unstable for any reason, an immediate missed approach/go-around must be conducted. This maneuver can be called for by either crew member at any time.

1. The aircraft is on the correct flight path
2. Only small changes in heading/pitch are necessary to maintain the correct flight path
3. The airspeed is not more than Vref +15 / - 0 KIAS
4. The aircraft is in the final landing configuration
5. Sink rate is less than 1000 FPM, unless previously briefed. If an approach requires a sink rate greater than 1000 FPM a special briefing should be conducted
6. All briefings and checklist have been conducted (except final checks)
7. Specific types of approach are stabilized if they also fulfill the following:
   a. ILS approaches must be flown within one dot of the glide-slope and localizer
   b. During a circling approach wings should be level on final before the aircraft reaches 300 feet above airport elevation
8. Unique approach conditions or abnormal conditions requiring a deviation from the above elements of a stabilized approach require a special briefing
9. An approach that becomes unstabilized below 1000 feet above airport elevation (or 500 ft above minimums whichever is higher) in IMC or 500 feet above airport elevation in VMC requires an immediate Go-Around.
10. Do not attempt to land from an unstabilized approach. The decision to go around is not an indication of poor performance, but rather good judgment.

6.15 GO AROUND/MISSED APPROACH

6.15.1 GENERAL

If any of the above conditions are not met, or if it becomes inadvisable to continue for landing for any reason a missed approach shall be initiated. More specific guidance for conditions when a missed approach should be initiated is detailed throughout these SOPs. However, such guidance cannot address all circumstances. Accordingly, either pilot should initiate a missed approach whenever a landing becomes inadvisable.

If a missed approach is initiated before full flap is extended, maintain a speed of at least Vyse. The power is advanced to maximum and the props are confirmed at max RPM after the “Go Around” call (at the PF’s discretion).

Flap 37º is a very high drag configuration and any pitch attitude greater than 0º will likely result in deceleration and a possible stall. If a missed approach is initiated with flap set to 37º, maintain a pitch attitude no greater than 0º until airspeed accelerates to at least 80 knots. At this point adjust pitch as required to maintain 80 knots.

The remainder of the missed approach can be completed as detailed in Section 3 under Take-Off Procedure.

6.15.2 CREW COORDINATION

CREW COORDINATION – MISSED APPROACH		
PF	**Condition**	**PM**
–	**"MINIMUMS"** auto call-out. No visual contact with runway or landing not advisable.	–
"GO AROUND, MAX POWER, FLAPS 10." Presses GA button, initiates climb at 80 KIAS	Aircraft at missed approach point.	–
–	–	Selects flaps 10 and verifies that propellers are at max RPM, power is set to maximum, responds **"MAX POWER SET, FLAPS 10 SET"**
Confirms NAV source FMS	–	Confirms NAV source FMS
–	400 feet AGL or safe altitude	**"400 FEET"**
"FLAPS UP, SET CLIMB POWER"	–	–
–	–	Selects flaps up, sets climb power, calls **"FLAPS UP, CLIMB POWER SET."**
"SELECT NAV (or **HDG), SELECT SPEED"** After selecting GA button, FD will be in ROL and GA mode and must be reset at or above 400 feet AGL.	–	–
	–	Makes appropriate selections on flight control panel, states **"NAV (HDG) SELECTED, SPEED SELECTED"**
Adjust climb speed with TCS button, as required	–	Advises ATC
"AFTERTAKEOFF CHECKLIST" The after takeoff checklist can be called in conjunction with flaps up and climb power or delayed until established on the MAP	–	–
	–	Completes after takeoff checklist in a read and do manner, and then states **"AFTER TAKEOFF CHECKLIST COMPLETE"**

6.16 COLD TEMPERATURE ALTITUDE CORRECTION PROCEDURES

Instrument approach charts will contain a snowflake symbol and a temperature -20°C/-4°F when the cold temperature correction must be applied. Pilots operating into airports requiring cold temperature corrections should request the lowest forecast temperature at the airport for departure and arrival times. When the temperature is forecast to be at or below any published cold temperature restriction, calculate an altitude correction for the appropriate segment(s) (Intermediate, Final, Missed Approach) as required.

All cold temperature corrected altitudes must be reported to Air Traffic Control (ATC) whenever applying a cold temperature correction on an intermediate segment and/or a published missed approach final altitude.

Refer to www.faa.gov/air_traffic/publications/notices NTAP, Part 4. Graphic Notices, Section 1. General - Cold Temperature Restricted Airports. For a complete list of Cold Temperature Restricted Airports.

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ICAO Cold Temperature Error Table

Height Above Airport in Feet

Reported Temp °C	200	300	400	500	600	700	800	900	1000	1500	2000	3000	4000	5000
+10	10	10	10	10	20	20	20	20	20	30	40	60	80	90
0	20	20	30	30	40	40	50	50	60	90	120	170	230	280
−10	20	30	40	50	60	70	80	90	100	150	200	290	390	490
−20	30	50	60	70	90	100	120	130	140	210	280	420	570	710
−30	40	60	80	100	120	140	150	170	190	280	380	570	760	950
−40	50	80	100	120	150	170	190	220	240	360	480	720	970	1210
−50	60	90	120	150	180	210	240	270	300	450	590	890	1190	1500

6.17 HIGH MINIMUM PIC LIMITATIONS

PICs with less than 100 hours in type aircraft must use the high-minimum pilot RVR landing minimums in accordance with MHI OpSpec C054. The table below outlines the high-minimum equivalent for the published approach RVR landing minimums.

NOTE: High-Minimum PICs may use actual approach minimums when under the direct supervision of an MHI Flight Instructor or Check Airman.

RVR Landing Minimum as Published	RVR Landing Minimum Required for High-Minimum PICs
RVR 1800	RVR 4500
RVR 2000	RVR 4500
RVR 2400	RVR 5000
RVR 3000	RVR 5000
RVR 4000	RVR 6000
RVR 5000	RVR 6000

6.18 SPECIAL INSTRUMENT APPROACH PROCEDURES

MHI is only authorized to conduct IFR operations using special instrument approaches and departures listed in OpSpec C081. Prior to conducting IFR operations to any airport served by a special instrument approach, the PIC will coordinate with MHI Operations to ensure the airport, weather reporting, and navigation facilities are available throughout the period required for that operation. Pilots will complete special instrument approach and departure training before executing any flights to the airport. Flights in uncontrolled airspace will be conducted to airports and on routes approved in MHI Operations Specifications.

6.19 LANDING

6.19.1 GENERAL

1. Landing distances for the destination airport must be at or less than 60 percent of the effective runway and 70 percent of the effective runway for an alternate airport in accordance with part 135.385 and 135.387.

2. Unless otherwise briefed, touch down should be on the 1000 foot markers or the first one third of the runway. At night the approach shall be made with reference to the GS/PAPI/VASI (when available).

3. When practical, reverse should be the primary means of deceleration on landing.

4. Brakes should only be applied once the nose wheel is on the runway, and then only to assist in slowing to a safe taxi speed. Additional braking can be used at the crew's discretion.

5. Directional control should be maintained using coarse application of rudder, into wind aileron, and asymmetric reverse.

6. Landings should be made with power at idle. Do not carry any power into the flare as this will greatly increase both the touchdown speed and the landing distance required.

6.19.2 LANDING SPEEDS

The aircraft should be maneuvered to cross the threshold at a height of 50 feet at the reference speed appropriate to aircraft flap angle and weight.

The minimum Vref airspeed is 1.3 times the stall speed as appropriate to flap angle and weight according to the following chart.

VREF Landing Speeds					
	12,300	**11,500**	**10,500**	**9,500**	**8,500 lbs**
0°	94	90	86	82	77
10°	85	83	79	75	71
20°	80	77	73	70	66
37°	74	70	67	64	Not Authorized

6.19.3 LANDING CHECKLIST

The Landing Checklist shall be accomplished after landing flaps have been selected, and is completed aloud by the PM in a read and do manner.

LANDING CHECKLIST (Read and Do)	
Item	**PM**
"Flaps"	As Required **- state setting** FLAP OVRD should be selected for FLAP 10 approaches
"Prop Levers"	**"Max RPM"** Check MAX RPM (96% Np). Confirm RESET PROPS caution CAS message is not present.
–	**"LANDING CHECKLIST COMPLETE"**

6.19.4 CROSSWIND LANDINGS

With flap set to 37°, crosswind landings have been demonstrated in a maximum crosswind component of 20 knots measured at 6 feet, which is equivalent to 27 knots at 50 feet. This was the maximum encountered during crosswind landing trials and is not considered limiting. In strong crosswinds, landing with flaps at 20° rather than 37° is recommended to reduce the crosswind component (as percentage of airspeed) at touchdown.

The preferred crosswind technique requires that the upwind wing be lowered during the approach with sufficient opposite rudder applied to align the aircraft with the runway. The nose wheel should be held on the ground during the ground roll, along with into wind aileron. As airspeed decreases during the ground roll, aileron and rudder inputs should progressively increase toward maximum deflection.

6.19.5 LOSS OF CONTROL ON GROUND

Loss of control on ground events comprise a significant percentage of Twin Otter incidents and accidents. Most of these events could have been mitigated with the use of proper aircraft handling techniques. The Twin Otter presents unique handling challenges on the ground due to its high lift wing, STOL capabilities, large tail, and lack of rudder pedal nose wheel steering. Pilots must be aware of these characteristics and proper handling techniques prior to operating the Twin Otter in challenging conditions. Pilots must continue to "fly" the aircraft even after it has landed, as the flight controls and wing continue to be effective even at taxi speeds.

Various factors can contribute to a loss of control on the ground. These include:

1. Touch down while aircraft is misaligned (crabbed) or with sideways drift
2. Out of center nose wheel during landing
3. Inappropriate use of nose wheel steering lever during takeoff and landing
4. Gusty wind
5. Crosswind
6. Quartering tailwind
7. Runway width
8. High speed taxiing (i.e. 20 to 50 knots)

Touch down while aircraft is misaligned (crabbed) or with sideways drift due to crosswind, gusty winds

Initial directional control during crosswind landings is dependent on the aircraft being longitudinally aligned with the runway during touch down. Unlike airliners or large turboprops, the Twin Otter does not have sufficient inertia to de-crab and continue along the runway centerline if landing is made while crabbed. Instead, the aircraft will immediately veer away from the runway centerline, and there is a high probability that in an attempt to correct this, the pilot will overcorrect and lose control of the aircraft. There is an additional risk of exceeding the landing gear structural side load limits, causing tire and landing gear damage.

Likewise, if a touchdown is made while the aircraft is drifting sideways across the runway, the aircraft will have a tendency to continue in that direction even after touchdown, which can lead to a loss of directional control after landing.

It is therefore very important that proper crosswind landing techniques are employed prior to, and during touchdown, to ensure that the aircraft is placed in the most favorable state to maintain control.

1. Fly a stabilized approach to the planned touchdown point
2. As the aircraft crosses the runway threshold, look at the end of the runway, not the touchdown point. This aids in the judgement of sink rate and aircraft longitudinal alignment.

3. Sideslip into the wind must be used to cancel drift caused by the crosswind component. Aileron into the wind and opposite rudder must be used together to keep the aircraft on centerline and heading towards the far end of the runway. When first learning crosswind landings, applying and holding this sideslip correction from an early point in the approach (100-200+ feet), is a good method to establish the required control inputs and become comfortable with the technique. Once the amount of deflection is comfortable in a particular wind, as airspeed decreases through the flare and touchdown, the amount of control input required will increase.

4. After touchdown, lower the nose wheel promptly and increase the amount of aileron and rudder deflection. In strong crosswind conditions, use maximum aileron deflection as soon as all wheels are on the ground.

5. After touchdown of all three wheels, and while maintaining rudder and aileron deflection, do not delay selection of BETA and REVERSE. To assist maintaining heading in crosswinds over 10 knots, reverse power can and should be used asymmetrically, with more reverse power applied on the downwind engine vs. the upwind engine.

6. Do not maintain a high taxi speed in the attempt to expedite the aircraft to a distant runway exit. Decelerate the aircraft to safe taxi speed without delay.

7. Until comfortable with crosswind landing techniques, aerodynamic and asymmetric power should be the primary focus to control speed and heading throughout the landing roll. After all three wheels are on the ground and BETA / REVERSE power has been applied, wheel brakes can be added to increase stopping effectiveness. Careful application of differential braking can assist aerodynamic inputs to increase directional control. In cross wind conditions, locking one or both main wheels significantly increases the risk of losing directional control, therefore maximum brake inputs should be avoided unless absolutely required. Aerodynamic control inputs should be held until the aircraft decelerates through 20 knots.

DIRECTIONAL CONTROL DURING CROSSWIND LANDINGS IS DEPENDENT ON THE AIRCRAFT BEING LONGITUDINALLY ALIGNED WITH THE RUNWAY DURING TOUCH DOWN AND PROPER CONTROL DEFLECTION DURING LANDING ROLL-OUT. THE USE OF THE NOSE-WHEEL STEERING LEVER AT SPEEDS GREATER THAN 10 KNOTS CAN RESULT IN LOSS OF DIRECTIONAL CONTROL AND A RUNWAY EXCURSION.

Out of center nosewheel during landing

Prior to landing pilots must ensure that the nosewheel is centered and locked. This can be gauged visually by observing the alignment of the index marks on the nose wheel steering lever and control column. The Captain should also confirm

that the nose wheel is locked by applying light pressure on the nose wheel steering lever to ensure that it cannot be moved.

In the event that the nose wheel is not centered, attempt to return it to a centered and locked position by moving the nose wheel steering lever. This will require less force at low airspeeds. If unable to correct the problem, and landing must be made with a nosewheel that is not centered, this is to be considered an emergency. Upon touchdown of the nose wheel, and as airspeed slows, it is likely that the nose will start tracking in the direction of the steering deflection. Landing into wind with flaps 37 and an appropriately slow touchdown speed will maximize the crew's ability to maintain control with rudder and asymmetric application of power and brakes.

Inappropriate use of nose wheel steering lever during takeoff and landing
The nose wheel steering lever is a very coarse control, intended only for use by the left seat pilot at low taxi speeds (i.e. 10 knots and below). At higher speeds, any nose wheel steering input can lead to large heading changes, possibly resulting in runway/taxiway excursions.
Directional control provided by rudder and differential use of power and brakes is sufficient for most taxi requirements, such as maintaining runway centerline or completing turns similar to that required to leave a runway via a typical high-speed taxiway. For sharper turns, maintain a slow taxi speed and use the tiller.

Quartering tailwind
Landing with quartering tailwinds presents unique challenges due to airflow disturbance over the tail of the aircraft during rollout. This can cause the rudder and ailerons to lose effectiveness at a higher than normal speed. Particular care must be exercised to avoid any tendency of the aircraft to weathercock, and the use of asymmetric reverse to maintain directional control becomes more important.

Runway width
When landing on narrow runways, proper technique becomes even more important. Should one of the main landing gear depart the surface of the runway, control difficulties will be greatly exacerbated. Touchdown must be made on the centerline of the runway, and any tendency of the aircraft to weathercock into the wind must be immediately counteracted with proper flight control inputs and differential reverse. Slow the aircraft to a safe taxi speed without delay.

High speed taxiing (i.e. 20 to 50 knots)
When landing at large or busy airports, ATC often requests that the pilots expedite the aircraft to a particular runway exit after landing. This places the aircraft in an undesirable and unsafe speed regime. At high taxi speeds and with the engines at low power, flight control effectiveness is low, while nose wheel steering sensitivity is too great. These factors when combined with strong or gusty wind conditions may cause a loss of control on the ground. If ATC specifies a particular runway exit that will require the pilots to taxi or roll the aircraft out at high speed, request a long landing or alternate taxi instructions.

6.20 AFTER LANDING

6.20.1 GENERAL

After the landing roll out but prior to exiting the runway or turning, the Captain will always have control and taxi the aircraft.

The After Landing Flow may be initiated only when clear of the runway. When the flows are complete, the PM will start the After Landing Checklist.

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 Checklist may be done on the runway.

6.20.2 CREW COORDINATION

CREW COORDINATION – AFTER LANDING		
Captain	**Condition**	**First Officer**
If Captain was PM, Captain assumes control to taxi the aircraft: **"I HAVE THE AIRCRAFT"**	Aircraft decelerated to safe taxi speed	**–**
–	**–**	First Officer relinquishes control to Captain: **"YOU HAVE THE AIRCRAFT"**
Performs after landing flow	Aircraft clear of active runway	Performs after landing flow
"AFTER LANDING CHECKLIST"	**–**	**–**
–	**–**	Performs after landing checklist, states **"AFTER LANDING CHECKLIST COMPLETE"**

6.20.3 AFTER LANDING FLOW

AFTER LANDING FLOW – FIRST OFFICER
Landing lights off
Select flaps 0
Strobe lights off
Ice protection off
Surface de-ice off
Weather radar off

6.20.4 AFTER LANDING CHECKLIST

The After Landing Checklist will be initiated by the Captain after both crew members have completed the after landing flow. It is accomplished in a read and do manner by the First Officer. The After Landing Checklist should be delayed until a safe time (i.e. below 20 knots, clear of the runway).

AFTER LANDING CHECKLIST (Read and Do)	
"Landing Lights"	As Required **- states switch position(s)**
"Flaps"	**"0 Set"**
"Environmental Switches"	**"Off"**
"Surface De-Ice Switches"	**"Off"**
"Ice & Rain Switches"	**"Off"**
"External Lighting Switches"	As Required **- states switch position(s)**
"WX Radar"	**"Off"**

6.21 SHUTDOWN

Once the aircraft has been taxied to the parking position and stopped, the Shutdown Checklist is performed to secure the engines and prepare the aircraft for unloading.

6.21.1 SHUTDOWN CHECKLIST

The Shutdown Checklist is normally accomplished by the Captain from memory and then verified with the checklist. During initial training it is acceptable for both pilots to perform the checklist in a challenge-response manner.

SHUTDOWN CHECKLIST (Memory)	
"Parking Brake"	**"Set"**
"Generator Switches"	**"Off"**
"Power Levers"	**"Idle"**
"Prop Levers"	**"Feather"**
"T5"	**"Stable Below 685º"**
"Fuel Levers"	**"Off"**
"Boost Pump Switches"	**"All Off"**
SHUTDOWN CHECKLIST (Memory) - *continued*	
"L Subpanel Switches"	As Required **- states switch position**
"R Subpanel Switches"	As Required **- states switch position**
"Master"	**"Off"**
"Battery/External"	**"Off"**
"Control Locks"	**"Installed"**
"ESIS Power"	**"Off"**
"Emergency Lighting"	**"Off"**

6.22 FLIGHT OPERATIONS QUALITY ASSURANCE (FOQA)

6.22.1 BACKGROUND

Section 60l(b) of the Federal Aviation Act of 1958 states that "*In prescribing standards, rules, and regulations, and in issuing certificates under this title, the Secretary of Transportation shall give full consideration to the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest."*

Maritime Helicopters' (MHI) commitment to this mandate is encompassed in our Safety Management System, company policies, operational procedures and corporate culture. Maintaining an injury free workplace for our employees and customers requires constantly seeking to improve upon our practices and embracing industry and technological advancements that can facilitate this goal.

Flight Data Monitoring (FDM) through the use of Flight Data Recorders (FDR) combined with a Flight Operations Quality Assurance (FOQA) program has proven to be highly effective in improving the overall safety of flight operations.

6.22.2 OVERVIEW

FOQA is defined as a program to improve flight safety by providing more information about, and greater insight into, the total flight operations environment through selective automated recording and analysis of data generated during flight operations.

The data collected includes air data, flight control/flap configuration, engine condition and trends, thrust levels, warning system alerts and more. Analysis of FOQA data can reveal situations that require improved operating, training, and maintenance procedures; practices; equipment; and infrastructure. The FOQA program will assist MHI in identifying

and addressing operational deficiencies and trends that are not generally detectable with other procedures, while complying with contractual requirements from our Fixed-Wing client.

The goal of FOQA is to IDENTIFY and CORRECT all deficiencies in flight operations.

6.22.3 KEY COMPONENTS

1. *Confidentiality* – All data will be de-identified and analyzed by an independent third-party gatekeeper (JH Data Consulting). This ensures that individual crewmembers cannot be associated with any FOQA data except through the gatekeeper.

2. *Anonymity* – Ensures that any identification of flight crews with specific FOQA flight data necessary during an analysis is eliminated at the earliest possible time.

3. *Data access and control* – Identifies data that requires protection and assigns overall responsibility for data protection. Also provides authorized access to reports and other data outputs and ensures the destruction of data after the retention period has expired.
4. *Protective Provisions and corporate policy* – The protective provisions of the MHI FOQA program are based on the protections outlined in the FOQA Rule 14 CFR 13.401, 14 CFR 193 and 49 U.S.C. § 40123 which protects voluntarily submitted information. MHI policy is that no flight crew shall ever be subject to disciplinary or other pejorative action by MHI based on data or information that is produced by the FOQA program. Additionally, no information will be shared in any form to support or facilitate FAA certificate action against a pilot. Maritime Helicopters will establish procedures for sharing FOQA trend analysis and other pertinent de-identified data with the FAA and Industry. MHI policy is to facilitate the free-flow of information to permit the most effective use and analysis of FOQA data.

6.22.4 EQUIPMENT

Maritime Helicopters will use the Latitude Technologies ION 100-004 IoNode Flight Data Monitoring System that wirelessly downloads the flight/event data at the termination of each flight. The DHC-6-400 also contains an L3 512 words-per-second digital flight data recorder with a 24-hour recording capacity.

6.22.5 PERSONNEL

JH Data consulting will be assigned as FOQA gatekeeper. John Deleeuw will be assigned as the FOQA Fleet Monitoring Team member and Scott Fell will be assigned as the FOQA Program Manager.

6.22.6 PROCEDURES

FOQA requires very little crew interaction. The following duties are assigned to each crew position Captain (CA), First Officer (FO), Mechanic (MX), FOQA Fleet Monitor (FM), FOQA Program Manager (PM)

1. At termination of each day's flying events and prior to hangaring, ensure hangar WIFI signal is active. (MX)
2. Ensure download is turned off if aircraft diverts (to prevent cell tower download). (FO)
3. Confirm download complete prior to engine shutdown (FO)
4. Verify data uploaded to server daily (EM requirement) (FO/PM)
5. Perform weekly access of stored FOQA data and validate the events (FM)
6. Perform weekly analysis to determine if crew contact is warranted for event. (FM)
7. Perform weekly FOQA data mining/query for hazard identification, analysis, and trends (PM)
8. Perform monthly presentations made from FOQA data for information to Safety and Management. (PM)
9. Perform monthly analysis and information from FOQA thoroughly explained to Safety and Management. (PM)
10. Perform quarterly Safety Promotion article (and company read file report) preparation for Safety, Management and FAA presentation (FM)

7 – ABNORMAL/EMERGENCY PROCEDURES

7.1 INTRODUCTION

The contents of this chapter pertain to 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 and general procedures, or a combination of both. Unless safety is jeopardized, they shall be applied in the handling of abnormal and emergency situations.

All additional abnormal and emergency procedures are located in the Viking 1-64-QRH (*Quick Reference Handbook*).

7.2 GENERAL

During abnormal and emergency procedures it is important to understand the following points to ensure a calm and controlled environment exists in the cockpit.

1. The following SOPs are designed to facilitate both crew members completing any memory or checklist items in a specific sequence. Once the memory items are complete the appropriate checklist will be called for by the PF. The PM will call and, after confirmation, action all items on the checklist, except those that are not within his/her reach.

2. In the process of completing memory and checklist items, it is the PF's primary responsibility to ensure the aircraft is flown in a stable and controlled manner.

3. The PM should control the pace of checklist items with respect to safety and the PF's ability to process, understand the situation and respond to the information accordingly.

4. During an emergency, after the initial actions and when the aircraft is in stable and controlled flight, the PF may elect to transfer flight control of the aircraft to the PM to better manage the situation.

5. These SOPs cover certain abnormal and emergency procedures, but do not cover the entire content of Section 3 from the AFM/POH. Where practical, the crew roles explained in these SOPs can be used as a guide for crews to deal with other emergency and abnormal procedures.

6. While performing a procedure for an abnormal or emergency situation, a non-rushed, diligent and methodical pace should be maintained by the crew. At no time should the abnormal or emergency situation interrupt the PF from flying the aircraft, or the PM from ensuring the correct procedural steps are being done.

7. PA announcements to the passengers following an abnormal or emergency situation should attempt to keep the passengers informed while minimizing their anxiety.

8. Any abnormality or emergency, even one that appears to be relatively minor, should result in the declaration of an emergency with ATC with "MAYDAY MAYDAY MAYDAY" or "PAN PAN PAN."

9. Below 500' AGL on landing, no action shall be taken other than the cancellation of the Master Warning or Master Caution annunciators, including identification by the PM of any applicable CAS messages.

7.3 INITIAL ACTIONS

1. **FLY THE AIRCRAFT.** The Pilot-In-Command must ensure that the PF is clearly designated at all times. The PF will not perform any tasks that would compromise his primary duty of flying the aircraft.

2. **ANALYZE THE PROBLEM**. The PF should ask for a description of the malfunction after reaching a safe altitude (not below 400 ft AGL).

3. **PERFORM MEMORY ITEMS.** Perform memory items in a controlled, measured manner. Delay any checklist actions until the aircraft is safely under control. Do not make any major system changes without confirmation from the other crew member.

4. **CALL FOR APPROPRIATE CHECKLIST.** Non-memory items on the emergency or abnormal checklist will be read by the PM in a read and do manner. The individual steps for a procedure will be accomplished by the appropriate (by seat position) pilot and accompanied with the specific response as per the checklist. If a step can be accomplished with equal ease from either seat, the PM will accomplish that task so as not to compromise the PF's responsibility of flying the aircraft.

The PF shall be responsible for:
1. Aircraft control
2. Call for appropriate checklist
3. Crew communication

The PM shall be responsible for:

1. Monitoring aircraft control
2. Reading the applicable checklist
3. Execution or confirmation of the required actions
4. Communicate with ATC and passengers

7.4 FAILED SYSTEMS/CIRCUIT BREAKER RESET POLICY

Unless otherwise indicated by the QRH no attempt should be made to a tripped circuit breaker unless it is considered necessary for the safe completion of the flight. In this case only one attempt shall be made.

POWER DISTRIBUTION CIRCUIT BREAKERS MUST NOT BE RESET

7.5 CONFIRMATION OF CRITICAL ACTIONS

Certain critical actions in an emergency checklist must be confirmed to ensure their correct completion.

These actions are:

1. Power lever - IDLE

2. Prop lever - FEATHER

3. Fuel lever - OFF

4. Boost pump switch - OFF

5. Fuel emergency switch - OFF
6. Fire push to discharge switch - PUSH
7. Generator switch - OFF

During abnormal and emergency situations in flight, the PM actions all checklist items the PF maintains control of the aircraft, providing confirmation of critical checklist actions when necessary.

When the PF calls for a checklist (eg: “ENGINE FIRE QRH”), the PM will read back the name of the checklist to ensure that the correct checklist is selected.

7.6 SPEEDS FOR ABNORMAL OPERATIONS

Recommended Speeds for Abnormal Operations	
Cruise (single engine)	120 KIAS
Initial approach (single engine)	100 KIAS
Final approach until landing assured (single engine, flaps 10)	90 KIAS
Balked landing (single engine)	80 KIAS

7.7 EVACUATION PROCEDURES

The emergency evacuation is initiated by the Captain using the standard call **“EVACUATE EVACUATE EVACUATE.”** If the Captain is unable to issue the command, the FO shall do so.

The evacuation command shall be given after the completion of the Engine Fire on Ground/Emergency Evacuation memory items.

7.7.1 CREW COORDINATION

CREW COORDINATION – EVACUATION		
Captain	**Condition**	**First Officer**
“EVACUATE, EVACUATE, EVACUATE”	Evacuation memory items complete	-
-	-	Leaves the cockpit and enters the cabin while considering the best exit strategy: • Rear doors • Under wing exits Once positioned at an exit, will open it and then get the passengers moving through it.
Obtain fire extinguisher, first aid kit, and flashlight	-	Move all passengers safely away from the aircraft.
Extinguish fire if necessary	-	-
Ensure all passengers are off the aircraft & obtains the passenger manifest, if able.	-	-

7.8 STALL RECOVERY

7.8.1 GENERAL

Aerodynamic stall can be identified by the first crew member to observe it, in the same manner as other abnormal/emergency procedures. The PF's first priority is control of the aircraft and recovery from the stall.

The first indication of an impending stall can be any of the following:

1. Stall warning light
2. Stall aural warning
3. PFD annunciation
4. Stall buffet
5. Aerodynamic stall

CAUTION

If a stall occurs during the approach phase, the aircraft may recover rapidly from the stall indication, however, it is imperative that the pilot execute a full Missed Approach Procedure after any stall warning as there may be other factors contributing to the onset of stall. Perform normal stall recovery procedures and push the GA button.

7.8.2 CREW COORDINATION

CREW COORDINATION – STALL RECOVERY		
PF	**Condition**	**PM**
"STALL, MAX POWER" Reduces angle of attack, simultaneously advances power levers to max power, while applying rudder as necessary to control sideslip, and aileron input as necessary to level the wings.	First indication of stall	–
–	–	Follows PF input of max power, ensures max power is set, responds **"MAX POWER SET"**
IF FLAPS HAVE BEEN SELECTED		
Increase airspeed above 85 KIAS (or a safe speed), **"FLAPS 10"**. See Note 1.	–	–
–	–	Selects flap 10, responds **"FLAP 10 SET"**
Establishes a climb at Vx (87 KIAS) and flight path away from terrain. Once clear of obstacles accelerates to Vy, calls for **"FLAPS UP"**	–	–
–	–	Selects flaps up, responds **"FLAPS UP"**
Note 1: A safe speed is defined as 1.3 x Vs for a given flap configuration and aircraft weight.		

7.9 ENGINE FAILURE DURING TAKEOFF AFTER VMC/V1 - AUTOFEATHER OPERATIONAL

7.9.1 CREW COORDINATION

CREW COORDINATION – Engine Failure During Takeoff After VMC/V1 (Autofeather Operational)		
PF	**Condition**	**PM**
–	V1	**"V1, ROTATE"**
Rotates to initial climb attitude	**–**	**–**
	Power Loss	**"ENGINE FAILURE"**
"MAX POWER, FLAPS 10, CONFIRM FEATHER"	**–**	**–**
OEI pitch attitude approximately 6º for 80 KIAS	**–**	Verifies that max power is set and that the failed engine propeller has feathered, responds **"MAX POWER SET, FLAPS 10 SET, LEFT/RIGHT ENGINE HAS FAILED AND FEATHERED"**
ACKNOWLEDGE	**–**	**–**
Adjusts pitch to maintain 80 KIAS (TCS can be used to set pitch bar for 80 KIAS)	**–**	Verifies that PM is maintaining 80 KIAS.
–	Aircraft has climbed to 400 feet AGL	**"400 FEET"**
"Select HDG or NAV, and SPD mode" (as required)	–	**–**
–	–	Pushes HDG button or NAV button, Pushes SPD button and calls **"HDG or NAV and SPD selected"**
"ENGINE SHUTDOWN MEMORY ITEMS"	**–**	**–**
–	**–**	Accomplishes the engine shutdown in flight memory items with conformation from the PF; when complete states **"MEMORY ITEMS COMPLETE"**
"QRH CHECKLIST"	At a safe altitude	**–**
–	**–**	Accomplishes the appropriate QRH procedure
PM performs a CAS message review. Look for any CAS messages that are not applicable to the current situation, and action them as required.		
Both pilots discuss intentions, identify any new threats (terrain, fuel, weather), advise ATC, reprogram FMS, etc.		

7.9.2 AMPLIFIED PROCEDURES

1. "Engine Shutdown Memory Items" have been developed to incorporate multiple 1-64-QRH engine failure conditions/procedures into one common procedure in order to enhance safety during critical phases of flight. At a safe altitude after the "Engine Shutdown Memory Items" have been completed, the PF will direct the PM to accomplish the appropriate 1-64-QRH checklist followed by the One Engine Inoperative Landing Checklist which is hyperlinked in all of the engine failure checklists within the QRH. When appropriate, a normal Descent and Landing Checklist will still need to be accomplished to ensure the aircraft is properly configured for the approach and landing. A Quick Reference Checklist (QRC) may be used to aid the PM when executing the memory items.

2. After reaching 400 feet or a minimum safe altitude, the appropriate lateral mode (HDG/NAV) should be selected and SPD mode selected to 80 KIAS, or other speed as required for the climb. This step help the PF maintain the appropriate airspeed and pitch angle until reaching a safe altitude.

3. Once the 1-64-QRH checklist is complete, it is acceptable and highly encouraged to match the power lever of the shutdown engine with that of the operating engine.

4. Crew should give consideration to an in-flight engine restart if they feel that the failure was not due to a catastrophic event, such as a loss of oil pressure.

7.10 ENGINE FAILURE DURING TAKEOFF AFTER VMC/V1 - AUTOFEATHER FAILS

7.10.1 CREW COORDINATION

CREW COORDINATION – Engine Failure During Takeoff After VMC/V1 (Autofeather Fails)		
PF	**Condition**	**PM**
–	V1	**"V1, ROTATE"**
Rotates to initial climb attitude	**–**	**–**
–	Power Loss	**"ENGINE FAILURE"**
"MAX POWER, FLAPS 10, CONFIRM FEATHER"	**–**	**–**
–	**–**	Verifies that max power is set and that the failed engine propeller has feathered, responds **"MAX POWER SET, FLAPS 10 SET, LEFT/RIGHT ENGINE HAS FAILED, NEGATIVE FEATHER"**
"FEATHER LEFT/RIGHT PROPELLER" Confirms left/right engine failure before directing PM to feather affected prop	**–**	**–**
–	**–**	PM will place hand on failed engine propeller lever for confirmation before moving to feather by stating **"CONFIRM LEFT/ RIGHT PROP LEVER"**
Confirms PM has selected correct propeller lever for failed engine, responds with **"CONFIRMED"**	**–**	**–**
–	**–**	Positions failed engine propeller lever to the feather position, states **"LEFT/RIGHT PROP FEATHER"**
–	Positive rate of climb indicated on VSI	**"POSITIVE RATE"**
Adjusts pitch to maintain 80 KIAS. (TCS can be used to set pitch bar for 80 KIAS)	**–**	Verifies that PM is maintaining 80 KIAS.
–	Aircraft has climbed to 400 feet AGL	**"400 FEET"**
"Select HDG or NAV, and SPD mode" (as required)	–	**–**

Engine Failure During Takeoff After VMC/V1 (Autofeather Fails) - *continued*		
–	–	**Pushes HDG button or NAV button, Pushes SPD button and calls "HDG or NAV and SPD selected"**
"ENGINE SHUTDOWN MEMORY ITEMS"	–	–
–	–	Accomplishes the engine shutdown in flight memory items with conformation from the PF, when complete states **"MEMORY ITEMS COMPLETE"**
"QRH CHECKLIST"	At a safe altitude	–
–	–	Accomplishes the appropriate QRH procedure
PM performs a CAS message review. Look for any CAS messages that are not applicable to the current situation, and action them as required.		
Both pilots discuss intentions, identify any new threats (terrain, fuel, weather), advise ATC, reprogram FMS, etc.		

7.10.2 AMPLIFIED PROCEDURES

1. "Engine Shutdown Memory Items" have been developed to incorporate multiple 1-64-QRH engine failure conditions/procedures into one common procedure in order to enhance safety during critical phases of flight. At a safe altitude after the "Engine Shutdown Memory Items" have been completed, the PF will direct the PM to accomplish the appropriate 1-64-QRH checklist followed by the One Engine Inoperative Landing Checklist which is hyperlinked in all of the engine failure checklists within the QRH. When appropriate, a normal Descent and Landing Checklist will still need to be accomplished to ensure the aircraft is properly configured for the approach and landing. A Quick Reference Checklist (QRC) may be used to aid the PM when executing the memory items.

2. After reaching 400 feet or a minimum safe altitude, the appropriate lateral mode (HDG/NAV) should be selected and SPD mode selected to 80 KIAS, or other speed as required for the climb. This step help the PF maintain the appropriate airspeed and pitch angle until reaching a safe altitude.

3. Once the 1-64-QRH checklist is complete, it is acceptable and highly encouraged to match the power lever of the shutdown engine with that of the operating engine.

4. Crew should give consideration to an in-flight engine restart if they feel that the failure was not due to a catastrophic event, such as a loss of oil pressure.

7.11 APPROACH AND LANDING – ONE ENGINE INOPERATIVE

Approach and landing with one engine inoperative is conducted the same as a normal approach and landing, with the following considerations:

1. Complete the One Engine Inoperative Landing checklist prior to commencing approach.
2. Bank angles greater than 15° should be avoided.
3. Do not select flaps beyond 10° until landing is assured.
4. Higher flap settings will result in decreased missed approach performance until flaps are raised to 10°.
5. For the reasons mentioned above, consider using flaps 10° for landing. Flap override mode on the TAWS must be enabled if landing with flaps 10°
6. Expect changing rudder forces as power is reduced for landing.
7. Use caution when applying zero thrust/reverse upon landing.

7.12 MISSED APPROACH – ONE ENGINE INOPERATIVE

7.12.1 CREW COORDINATION

CREW COORDINATION – MISSED APPROACH (One Engine Inoperative)		
PF	**Condition**	**PM**
–	**"MINIMUMS"** auto call-out. No visual contact with runway or landing not advisable.	–
"GO AROUND, MAX POWER, FLAPS 10." Presses GA button, initiates climb at 80 KIAS	Aircraft at missed approach point.	–
–	–	Selects flaps 10 and verifies that propellers are at max RPM, power is set to maximum, responds **"MAX POWER SET, FLAPS 10 SET"**
Confirms NAV source FMS	–	Confirms NAV source FMS
–	400 feet AGL or safe altitude	**"400 FEET"**
"SELECT NAV or HDG, SELECT SPEED" After selecting GA button, FD will be in ROL and GA mode and must be reset at or above 400 feet AGL.	–	–
–	–	Makes appropriate selections on flight control panel, states **"NAV (**or **HDG) SELECTED, SPEED SELECTED"**
Adjust climb speed with TCS button, as required	–	Advises ATC

7.12.2 AMPLIFIED PROCEDURES

1. A single-engine missed approach must not be attempted if:
   a. the airspeed is below 80 KIAS
   b. the flaps are set at more than 10°

2. A good target pitch attitude for Maximum Landing Weight OEI go-around is 7º to achieve 80 KIAS climb in ISA conditions with Flaps 10 set.

7.13 TCAS PROCEDURES

7.13.1 GENERAL

TCAS generates two types of annunciations: a Traffic Advisory (**TA**) and a Resolution Advisory (**RA**). It cannot be overemphasized the importance of reacting correctly to either a **TA** or **RA**.

7.13.2 CREW COORDINATION – TCAS TRAFFIC ADVISORY (TA)

CREW COORDINATION – TCAS TRAFFIC ADVISORY (TA)	
PF	**PM**
Look at PFD/INAV and identify the position of the conflicting aircraft relative to the aircraft.	Look outside and attempt to locate the aircraft in relation to the PF's position call.
Place one hand on the controls and one hand on the power levers in preparation for an **RA**.	Call **"VISUAL"** if visual contact is obtained and state 'clock position' for visual reference

NOTE

The autopilot (if installed) shall not be disconnected for a TA unless it progresses into an **RA**. Flight crews shall not deviate from an assigned clearance in response to a TA unless it progresses into an **RA**.

7.13.3 CREW COORDINATION – TCAS RESOLUTION ADVISORY (RA)

CREW COORDINATION – TCAS RESOLUTION ADVISORY (RA)	
PF	**PM**
Disconnect the Autopilot. Place one hand on the control column and one on the power levers.	Referencing the MFD then looking outside, try to locate the aircraft.
Follow the commands orally and visually as displayed on the PFD.	Call **"VISUAL"** if visual contact is obtained.
–	Advise ATC with radio call **"(Call sign) TCAS RA"**
When clear of conflict, return aircraft to previously cleared altitude.	**–**
–	Advise ATC with radio call **"(Call sign) CLEAR OF CONFLICT, RESUMING (cleared altitude)"**

7.13.4 AMPLIFIED PROCEDURES

1. Landing lights shall be left in the STEADY - OFF and PULSE - TCAS after take-off and prior to approach.
2. If simultaneous TCAS and TAWS warnings occur, the TAWS shall take precedence.
3. If simultaneous TCAS and STALL warnings occur, the STALL shall take precedence.

7.14 TAWS PROCEDURES

7.14.1 GENERAL

There are some situations where the TAWS/EGPWS will give either false warnings (data base error) or a warning because of a temporary flight path such as a circling or VFR pattern where hills or mountains may cause a warning during a turn to downwind or a turn to final, as well as others. The “TERR INHIBIT” button may be pressed under certain circumstances when clearance from terrain is visually confirmed by both the PF and PM.

The Crew shall operate the TAWS/EGPWS “TERR INHIBIT” as follows.

1. During IMC conditions TAWS/EGPWS warnings will always be responded to and the TERR INHIBIT function will not be used.

2. During night VFR conditions when established on either a visual glideslope and/or electronic glide slope the TAWS/EGPWS may be inhibited.

3. During Day VFR conditions when terrain clearance can be confirmed the TAWS/EGPWS may be inhibited.

7.14.2 CREW COORDINATION

CREW COORDINATION – TAWS ADVISORY/WARNING		
PF	**Condition**	**PM**
–	TAWS Advisory/Warning, no visual reference. **“CAUTION TERRAIN”** or **“CAUTION OBSTACLE”** or **“TERRAIN TERRAIN, PULL UP PULL UP”**	–
Call **“TERRAIN MAX POWER”** and disconnect autopilot.	–	–
–	–	Sets max power, **“MAX POWER SET”**
Adjust pitch to 20º nose up and monitor airspeed decrease. Establish a climb at 87 KIAS. *Do not change configuration.*	–	Monitor pitch up to 20º nose up and begin calling radar altimeter. e.g: **“xxx FEET CLIMBING / DESCENDING”**
Capture 87 KIAS and decrease pitch attitude to maintain best angle of climb speed (Vx)	–	Determine safe altitude with reference to maximum elevation number displayed on TAWS overlay, and advise PF
–	–	Continue calling radar altimeter until clear of terrain and ground contact threat.
Increase power levers to full forward, and call: **“FULL POWER”**	Ground contact remains a threat	–

7.14.3 AMPLIFIED PROCEDURES

1. If simultaneous **TCAS** and **TAWS** warnings occur, the **TAWS** shall take precedence.
2. If simultaneous **STALL** and **TAWS** warnings occur, the **STALL** shall take precedence.
3. During night or IMC conditions, the above actions shall be accomplished by recall without any delay for diagnosis.

4. During day VMC conditions, with terrain and obstacles clearly in sight, the alert may be considered cautionary. Take corrective action, as necessary, to recover safe terrain clearance, and until the alert ceases or a safe trajectory is ensured.
5. Climbing is the only recommended response to alerts unless operating in visual conditions.
6. The "TERR INHIBIT" button can be used to silence a **TAWS** warning during Day/VMC, when landing at airports not in the Honeywell FMS. For example, when using Floats, Skis or Off-Strip.
7. Actions for any **TAWS** Caution/ Warning involving "**OBSTACLE**" should be the same as for "**TERRAIN**" if the obstacle is not sighted.

7.15 WINDSHEAR PROCEDURES

7.15.1 GENERAL

Effects of windshear on the aircraft flight path typically appear as deviations from the expected flight path or aircraft performance, such as:

1. +/- 15 knots indicated airspeed.
2. +/- 500 fpm vertical speed
3. +/- 5 degrees pitch attitude
4. Uncommanded vertical displacement of greater than 1 dot from the glideslope
5. The requirement to use a significantly different power setting for a significant period of time to achieve the desired aircraft performance.

The onset of one or more of these conditions may indicate that the aircraft is being affected by windshear. If indications persist, initiate the windshear escape maneuver without delay.

7.15.2 CREW COORDINATION

CREW COORDINATION – WINDSHEAR ESCAPE MAMEUVER		
PF	**Condition**	**PM**
Call **"WINDSHEAR MAX POWER"** and disconnect autopilot	Unacceptable flight path deviations on final approach or initial climb	–
–	–	Sets max power, **"MAX POWER SET"**
Establish pitch attitude to maintain 75 to 80 KIAS for existing conditions (approximately 5º to 7º nose up) *Do not change configuration.*	–	Monitor pitch attitude and begin calling radar altimeter, e.g: **"xxx FEET CLIMBING/DESCENDING"**
Avoid stall and decrease pitch attitude immediately if stall warning occurs or if airspeed drops below 75 KIAS	–	Continue calling radar altimeter until clear of terrain and ground contact threat.
Increase power levers to full forward, and call: **"FULL POWER"**	Ground contact remains a threat	–
–	–	When clear of windshear conditions advise ATC and assist PF with missed approach/after takeoff items as required.

7.16 ICE CONTAMINATED TAILPLANE STALL (ICTS) PROCEDURES

If icing conditions are encountered in flight, pilots should refer the AFM for proper enroute and approach procedures. The following procedures are general in nature and should only be used as a guide when in icing conditions:

1. Get out of icing conditions as soon as possible by requesting a lower altitude. Only climb if terrain is a factor.
2. Activate anti-icing systems in accordance with AFM guidance.
3. Expect higher stall speeds if ice accumulation occurs.
4. Monitor airspeed and angle of attack; increase power/airspeed as necessary.
5. Periodically turn off the Autopilot to check control pressures and trim.
6. If buffeting occurs with flaps up, assume a wing stall is imminent and perform recovery procedures by trading altitude for airspeed (notify ATC as soon as possible if a lower altitude is needed).
7. Use a Flap 10 for approach and increase approach speeds in accordance with AFM procedures (15% increase is recommended).
8. Land as soon as practical.