REPUBLICA DE CABO VERDE

AAC
AGÊNCIA DE AVIAÇÃO CIVIL

Circular Nº 20/DSV/2015

SUBJECT: STANDARD OPERATING PROCEDURES (SOP) MANUAL

DATE: 24/09/2015

1. OBJECTIVE

1.1.1 This circular provides guidance and directions on the evaluation of an operator's Standard Operating Procedures (SOP)

2. BACKGROUND

2.1.1 Standard Operating Procedures (SOPs) containing the required information and approved by the AAC under the provisions of this circular is an approved manual or section in a manual serving as the flight crew's guide to standard operating procedures, for the purposes of the regulations. It may double as a training guide. Checklists and briefings should be integral parts of a SOP.

2.1.2 Standard operating procedures (SOPs) are universally recognized as basic to safe aviation operations. The International Civil Aviation Organization (ICAO) has also recognized the importance of SOPs for safe flight operations. ICAO Annex 6 establish that each member State should require that SOPs for each phase of flight be contained in the operations manual used by pilots.

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

2.1.4 Safety in commercial aviation continues to depend on good crew performance. Good crew performance, in turn, is founded on standard operating procedures that are clear, comprehensive, and readily available to the flight crew. This circular presents background, basic concepts, and philosophy with respect to SOPs. It emphasizes that SOPs should be clear, comprehensive, and readily available in the manuals used by flight crewmembers. This circular is designed to provide advice and recommendations about the development, implementation, and updating of SOPs.

2.1.5 As a minimum, the operator must include sufficient detail to allow a trained crew to safely and effectively operate the aircraft. The manual may be divided into subsections such as normal, non-normal, and emergency procedures.

2.1.6 The operator's performance data in an SOP must contain data from the AFM and instructions on how to use that data. Operators may assign the responsibility for performing takeoff and landing data computations to flight crew or ground personnel. The flight crew must have access to adequate data in the cockpit, (including information for the specific airport and runway to be used) to perform the computations for which they are responsible. The SOP may contain descriptions, and expanded explanation of procedures, special policies and procedures, and

other selected topics pertinent to operation of the aircraft type. The SOP must conform to the regulations and safe operating practices but do not need to conform to corresponding sections of the AFM, either in format or content.

2.1.7 SOP developed by or for the operator contains sufficient explanation and guidance for flight crew use in the safe operation of the particular aircraft type. Background information or information that is not specific to the operation of the particular aircraft should be placed in a section of the Operations Manual, rather than in a supplementary section of the SOP. This circular does not list every important SOP topic or dictate exactly how each topic should be addressed by a certificate holder. Instead, it offers a baseline of topics to be used as a reference to achieve consistently safe flight operations through adherence to SOPs that are clear, comprehensive, and readily available to flight crewmembers. In practice, each certificate holder's manuals and training programs are unique to the certificate holder.

2.1.8 Annex 3A, Standard Operating Procedures Template, provides many important topics that should be addressed in SOPs. Stabilized Approach, characterized by a constant-angle, constant-rate of descent ending near the touchdown point where the landing manoeuvre begins, is among the SOPs specifically identified in this circular and is described in Annex 3B, Stabilized Approach: Concepts and Terms. These and the other appendices represent a baseline and a starting point. Start-up certificate holders and existing certificate holders should refer to the Template in Annex 3A, Stabilized Approach in Annex 3B, and to the other appendices in developing comprehensive SOPs for use in training programs and in manuals used by their flight crewmembers.

2.1.9 This (SOPs) have been made to improve clarity, accuracy, completeness, and consistency. Two significant changes are the conversion of the term pilot not flying (PNF) to pilot monitoring (PM) and the addition of a related Appendix addressing "Crew Monitoring and Cross-Checking." It is increasingly acknowledged that it makes better sense to characterize pilots by what they are doing rather than by what they are not doing. Hence, pilot flying (PF) remains an appropriate term and is unchanged in this circular. But the term pilot not flying misses the point. Studies of crew performance, accident data, and pilots' own experiences all point to the vital role of the non-flying pilot as a monitor. Hence, the term pilot monitoring (PM) is now widely viewed as a better term to describe that pilot. The term PM is used liberally throughout this circular. In those instances where the older term PNF appears, it should be understood that pilot monitoring (PM) is the preferred meaning. However, when the manufacturer uses the term PNF, in its aircraft manuals, the AOC holder should use the same in those manuals related to that airplane.

3. KEY FEATURES OF EFFECTIVE SOPS

3.1.1 Many experts agree that implementation of any procedure as a SOP is most effective if:

(1) The procedure is appropriate to the situation;

(2) The procedure is practical to use;

(3) Crewmembers understand the reasons for the procedure;

(4) Pilot Flying (PF), Pilot Not Flying (PNF) / Pilot Monitoring (PM), and Flight Engineer duties are clearly delineated;

(5) Effective training is conducted;

(6) The attitudes shown by instructors, check airmen, and managers all reinforce the need for the procedure.

3.1.2 If all elements (above) are not consistently implemented, flight crew too easily become participants in an undesirable double standard condoned by instructors, check airmen, and managers. Flight crew may end up doing things one way to satisfy training requirements and check rides, but doing them another way in "real life" during line operations. When a double standard does appear in this way, it should be considered a red flag that a published SOP may not be practical or effective for some reason. That SOP should be reviewed and perhaps changed.

3.1.3 When flight crewmembers understand the underlying reasons for an SOP, they are generally better prepared to handle a related in-flight problem that may not be explicitly or completely addressed in their operating manuals.

3.1.4 The certificate holder, in turn, benefits from more competent feedback in revising existing SOPs and in developing new SOPs. Those benefits include safety, efficiency, and employee morale.

4. COLLABORATING FOR EFFECTIVE SOPS

4.1.1 In general, effective SOPs are the product of healthy collaboration among managers and flight operations people, including flight crew. Development of SOPs is most effective when done by collaboration, using the best resources available including the end-users themselves, the flight crew. Once developed, effective SOPs should be continually reviewed and renewed. A safety culture promoting continuous feedback from flight crew and others, and continuous revision by the collaborators distinguishes effective SOPs at airlines of all sizes and ages.

4.1.2 New operators, operators adding a new aircraft fleet, or operators retiring one aircraft fleet for another must be especially diligent in developing SOPs. Collaborators with applicable experience may be more difficult to bring together in those instances.

4.1.3 For a start-up certificate holder, this circular and its appendices should be especially valuable tools in developing SOPs. The developers should pay close attention to the approved airplane flight manual (AFM), to AFM revisions and operations bulletins issued by the manufacture. Desirable partners in the collaboration would certainly include pilots having previous experience with the airplane or with the kind of operations planned by the operator, and representatives from the AAC, including the principal operations inspector (POI), members of the Certificate Management Team, and members of the Certification, and Evaluation Team. It is especially important for a new operator to maintain a periodic review process that includes line flight crew. Together, managers and flight crew are able to review the effectiveness of SOPs and to reach valid conclusions for revisions. The review process will be meaningful and effective when managers promote prompt implementation of revisions to SOPs when necessary.

4.1.4 An existing certificate holder introducing a new airplane fleet should also collaborate using the best resources available, including the AFM, and operations bulletins. Experience has shown that, managers, check airmen, instructors, and line pilots work well together as a team to develop effective SOPs. A trial period might be implemented, followed by feedback and revision, in which SOPs are improved. By being part of an iterative process for changes in SOPs, the end user, the flight crewmember, is generally inclined to accept the validity of changes and to implement them readily.

4.1.5 Long-established operators should be careful not to assume too readily that they can operate an airplane recently added to the fleet in the same, standard way as older types or models. Managers, check airmen, and instructors should collaborate using the best resources available, including the AFM, and operations bulletins, to ensure that SOPs they develop or adapt for a new airplane are in fact effective for that aircraft, and are not inappropriate carryovers.

5. PROCEDURES

5.1.1 General

5.1.1.1 All procedures published in an SOP should agree with those from AFM/FCOM or QRH.

5.1.1.2 Procedures incorporated in an SOP should be tailored by the operator to accommodate the operator's type of operation, fleet standardisation objectives, and cockpit management objectives. As an operator's operations become more complex, it is progressively more important to include detailed guidance in the SOP, which is specifically tailored to the operator's operations.

5.1.1.3 Aircraft which have been modified by Supplemental Type Certificate (STC) may require different procedures than unmodified aircraft.

5.1.1.4 Procedural information included in a SOP must be presented in a step by step format. A procedural step in an FCOM procedure must be included in the equivalent SOP procedure, unless the AAC approves the deletion through the process described in subparagraph 3.4.1.7 (1) that follows.

5.1.1.5 Operators are responsible for developing effective standard operating procedures. The development process for standard operating procedures consists of the operator or other qualified party (such as the manufacturer) conducting a painstaking task analysis of the man machine environment relationship. Although this analysis is time consuming and expensive, it is necessary to meet the required level of safety in air transport operations. Specific guidelines for developing aircraft operating procedures are almost nonexistent.

5.1.1.6 Operators should standardise their operating procedures both within and across aircraft types to the greatest extent possible. Inspectors should make operators aware of the following information concerning procedures for standardisation:

(1) Standardised procedures promote understanding and effective communications between crewmembers. Research has shown that standardised procedures and effective communications are significant factors in reducing error in the cockpit and in enhancing safety.

(2) Crewmembers of most large operators operate numerous different aircraft during their career. Standardised procedures enhance a crewmembers transfer of learning and minimise negative transfer when the crewmember transitions from one aircraft to another.

(3) A complete standardisation of procedures is not possible when there are significant differences between "manufacturer's" and "installed" equipment. A high degree of standardisation, however, is possible. For example, the flight procedures for: engine failure after V1, engine fire after V1, and a missed approach with an engine out, can be designed to be identical. Each procedure might include the aircraft climbing at a reference speed to an identical clean up height, then accelerating, then retracting the flaps, and then continuing the climb at specified engine-out climb speed. The reference speeds might change

depending on the aircraft mass, but the procedure could otherwise be identical. If the operator designed these procedures carefully, they could be used on all aircraft in the operator's fleet.

5.1.1.7 AAC may approve combined procedural steps. For example, an AFM or FCOM procedure specifies a two-step procedure such as the following: Step 1 - Smoke Goggles On, and Step 2 - O2 Mask On. The AAC could approve a one-step procedure such as the following: Step 1. Smoke Goggles and O2 Mask - On. If there is a specific reason, however, for not combining the steps, the inspector must not approve such combinations. For instance, if in the previous example, for some reason the smoke goggle has to be put in place before the O2 mask can be put into place, the two-step procedure should be retained.

5.1.1.8 AAC may approve an arrangement of procedural steps in a different sequence from the sequence in the AFM or FCOM. The operator must demonstrate to the Inspectors satisfaction that the change in sequence is safe and effective through validation testing. The inspector shall ensure adverse effects are not introduced. For example, with many aircraft the flaps are required to be extended or the trim to be set to specific settings before an adequate control check can be accomplished. If this sequence is reversed, the control check is invalid.

5.1.1.9 AAC may approve the combination of similar procedures into a single procedure. For example, it may be desirable for an operator to combine engine fire, engine failure, and severe engine damage procedures into a single procedure. Inspectors may approve the resulting procedure when validation testing shows the procedure to be clear, easy to use, and if it retains the safeguards of the individual procedures it replaces. If the combined procedure results in a complex and error prone procedure, the inspector shall not approve it.

5.1.1.10 The ACC shall require the operator to present evidence that newly developed procedures are effective. This may be done by analysis, documentation, or validation tests. Tests may be conducted by the manufacturer, the operator, or another competent party (such as a contractor). The inspector or a designated inspector qualified in the aircraft must evaluate the effectiveness of such tests.

5.1.2 Normal procedures

5.1.2.1 The normal procedures section of an SOP must contain procedures for each normal operation that flight crewmembers are required to perform. Each normal procedure should be amplified by the operator with sufficient instruction to ensure that the procedure is properly accomplished. Inspectors must ensure that this instruction is thorough enough to provide the least experienced flight crewmember with sufficient information to perform the procedures.

5.1.2.2 Many operators include normal operating checklists and an explanation of how to accomplish each step of the checklists in the normal Procedures Section of the SOP. This is an acceptable practice; however, it is important to understand that an explanation of how to perform the normal checklist is not the only material required in the normal Procedures Section of a SOP. Guidance for operational procedures for which there are no checklists (such as the takeoff procedure) must also be addressed. Procedures for crew co-ordination and for the use of checklists must be included. The SOP must contain clearly specified crew duties. For example, the SOP should contain a specific assignment for the crewmember that is responsible for setting power and maintaining directional control when the SIC is conducting a takeoff.

5.1.2.3 AAC may require the operator to develop and publish normal procedures in an SOP which are not in the AFM, when the procedures are necessary to ensure an adequate level of safety. Instrument approach procedures, adverse weather operations, long range navigation, and

special procedures for CAT II and CAT III operations are all examples of required normal procedures which may not be in an AFM or RFM.

5.1.3 Non-normal and emergency procedures

5.1.3.1 Non-normal (or abnormal) and emergency procedures in an AFM or FCOM are usually presented in more detail than are normal procedures. The steps and the order of steps in these procedures are often critical. Inspectors must exercise caution in approving the modification of non-normal and emergency procedures. The effects of most procedural steps on the airworthiness of the aircraft are obvious but the effects of some are not. For example, it may be necessary to depressurize a hydraulic system to successfully perform a manual landing gear extension. Deleting a step or a change in the sequence of steps of such a procedure could make the procedure ineffective. There have been instances in which operators have erroneously proposed modifying an AFM or FCOM procedure, and Inspectors have unintentionally approved the modification, which invalidated the certification basis of the aircraft. Inspectors should use the guidance that follows when evaluating an operator's non-normal or emergency procedures in AFMs or SOPs.

5.1.3.2 When an operator proposes to modify a non-normal or emergency procedure, the operator must show that the modified procedure does not adversely affect the airworthiness of the aircraft. The operator may establish the safety and effectiveness of proposed procedures by analysis, documentation, or validation tests.

5.1.3.3 Inspectors shall contact the applicable appropriate authority and obtain concurrence before approving deletion of an item or the rearrangement of items on these checklists. Appropriate authority concurrence may be expressed informally (by telephone). Appropriate authority concurrence is not required if the operator provides evidence that the appropriate authority has already concurred with the identical procedure for another party (such as another operator or manufacturer).

5.1.4 Immediate actions

5.1.4.1 An immediate action is an action that must be accomplished so expeditiously (in order to avoid or stabilize a hazardous situation) that time is not available for a crewmember to refer to a manual or checklist. Crewmembers must be so familiar with these actions that they can perform them correctly and reliably from memory. Inspectors must ensure that immediate action situations are included in an operator’s SOP, as appropriate.

5.1.4.2 Situations that require immediate action include, but are not limited to the following:

(1) Imminent threat of crewmember incapacitation;

(2) Imminent threat of loss of aircraft control;

(3) Imminent threat of destruction of a system or component which makes continued safety of the flight and subsequent landing improbable.

5.1.4.3 Under this criterion, a flight crew donning oxygen masks in response to a depressurisation or turning off the fuel and ignition in case of a hot start are situations requiring mandatory immediate action items. The loss of thrust on a jet engine during cruise, however, would not normally require an immediate action item according to this criterion.

5.1.4.4 Inspectors must ensure that immediate action items are explicitly identified as such in an operator's SOP. It is not acceptable for immediate action items to be hidden (not specifically identified as an immediate action) in procedures or checklists.

5.1.4.5 Certain situations that either require or appear to require immediate action have proven to be a stimulus for evoking incorrect and inappropriate flight crew actions. Therefore, immediate action items must be strictly limited to only those actions necessary to stabilise the situation. Inspectors must ensure that all remaining actions are accomplished by "challenge-do-verify" (CDV) checklists. CDV checklists have checklist items that require confirmation from a second crewmember before the step may be taken.

5.1.4.6 Inspectors may approve an operator's proposal to replace immediate action items in an AFM procedure with challenge-do-verify (CDV) checklist procedures in a SOP, provided the operator shows compliance with the criteria in this paragraph and also demonstrates an equivalent level of safety through validation tests.

5.1.5 Mandatory confirmation items

5.1.5.1 There are certain critical procedural steps that shall be confirmed by a second crewmember before the step may be taken. Inspectors must ensure that an operator's procedures, which contain such critical procedural actions, must clearly identify the critical actions and the crewmember that is responsible for giving the confirmation. The types of procedural actions that require this confirmation include the following:

(1) Actions resulting in the shutting down of an engine;

(2) Actions resulting in the deactivation of flight controls;

(3) Actions that if performed incorrectly, in the wrong sequence, or at the wrong time produce a catastrophic result, even if the incorrect action is not highly likely;

(4) Actions where past experience or analysis has shown that there is a high probability for error or incorrect action and which creates a hazardous situation.

5.1.6 Crewmember roles

5.1.6.1 The SOP must clearly define the various crewmember roles and responsibilities. Inspectors should use the following guidance when ensuring that the operator clearly states policy and guidance for cockpit management in the SOP.

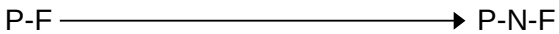
5.1.6.2 PIC Responsibilities. The operator's policy and guidance should make it clear that the PIC's primary responsibility is to manage the actions of the crew and the conduct of the flight. While the PIC may delegate the management of the flight and manipulation of the controls to the SIC, the SOP must not indicate that the PIC can delegate the responsibility for safe conduct of the flight.

5.1.6.3 Responsibilities of Flight Crewmembers Not in Command. The operator's flight manual should contain policy and guidance for those flight crewmembers not in command, as to their responsibilities to the PIC and their responsibilities for the safe conduct of the flight.

5.1.6.4 SIC Responsibilities. The SOP must contain guidance for the PIC concerning the conditions and circumstances in which an SIC may operate the aircraft. The operator's policies must delineate the limits of authority delegated to the SIC when the SIC is the pilot flying (P-F). The operator's policies should address crew management in critical situations. For example, there

may be certain situations in which the SIC should be the pilot flying (P-F) so that the PIC can concentrate on managing those situations, particularly ensuring that required actions and appropriate checklists are properly accomplished. Procedures for transfer of control must be clearly addressed in the SOP.

5.1.6.5 Communications. In general, proper cockpit management requires effective communication and co-operative action between crewmembers which form consecutive closed loops. An example of this interaction is in the illustration that follows:



Commands Action	Acknowledges Command
"Flaps - Approach"	"Flaps to Approach"

5.1.6.6 Co-ordination. Research has shown that effective flight crew co-ordinate their actions before any action is required. Inspectors shall ensure that SOPs contain a requirement for briefings and also adequate guidance for the content of those briefings.

5.1.7 Operations not evaluated in aircraft certification

5.1.7.1 If the operator proposes to conduct operations, which have not been evaluated during aircraft certification, the inspector must ensure that the operator has developed and obtained approval of procedures for the conduct of the proposed operation. Such operations are often indicated by the absence of a procedure for the operation in the AFM or FCOM. Examples of such operations could include powerback and taxi with engine shutdown. Inspectors should use the following guidance when evaluating those operations not evaluated during aircraft certification.

5.1.7.2 Inspectors must ensure that each operation conducted must be specifically addressed by a procedure. For example, it should not be assumed that a procedure for shutting down and then restarting an engine during a taxi delay is equivalent to a procedure for delaying an engine start on initial taxi out. The same procedure may not be used for more than one operation unless analysis shows that more than one operation may be safely conducted using the same procedure.

5.1.7.3 Inspectors must ensure that an operational procedure is thoroughly co-ordinated with airworthiness Inspectors. Since adverse effects that a procedure could cause to the airworthiness of an aircraft or its systems may not be immediately apparent, the INSPECTOR must ensure that co-ordination with airworthiness is required. For example, a procedure for taxiing with engine shutdown could have a detrimental effect on the landing gear system if high asymmetrical engine thrust is used during sharp turns. If there is any question concerning the effects a procedure may have on the airworthiness of the aircraft, the Inspector must co-ordinate with and obtain concurrence from the appropriate authority before granting approval of the procedures.

5.1.8 Limitations

5.1.8.1 Inspectors must ensure that when operating limitations are incorporated in a SOP, that each limitation was transferred from the AFM or FCOM. Inspectors should use the following guidance when evaluating the limitations of an operator's SOP.

5.1.8.2 Inspectors should evaluate the operator's SOP to ensure that all operating limitations published in the SOP are clearly identified as AFM limitations. Operators may add limitations to SOPs which were not in an AFM or FCOM. One method of accomplishing this is for the operator to express all operator imposed limitations as policy statements in applicable procedures. When the operator chooses to blend AFM and operator imposed limitations in the limitations section of a SOP, the inspector must ensure that the operator used a method for clearly distinguishing each AFM limitation from the operator imposed limitations.

5.1.8.3 The operator is responsible for informing crewmembers of all AFM operating limitations. Crewmembers are responsible for observing all AFM limitations. The INSPECTOR must ensure that the SOP contains a statement that crewmembers are responsible for being aware of and for observing all limitations.

5.1.9 Applying the SOPs template and other appendices

5.1.9.1 Generally, each SOP topic identified in the template (following as Annex 3A) is important; the certificate holder should address them in some manner, if applicable. Stabilized Approach (Annex 3B) is a particularly important SOP. Other important SOPs, such as those associated with special operating authority or with new technology, are not shown in the template, but should be addressed as well, when applicable. Because each certificate holder's operation is unique, the certificate holder should develop the specific manner in which SOPs are addressed. Topics expanded and illustrated in the Attachments are for example only, and represent renditions of SOPs known to be effective. No requirement is implied or intended to change existing SOPs based solely on these examples. An SOP topic shown in the Attachments may be addressed in detail, including text and diagrams, or in very simple terms. For example, an SOP may be addressed in a simple statement such as: "ABC Airlines does not conduct Category 3 approaches."

5.1.10 Notes on appendices

5.1.10.1 The following appendices contain examples of standard operating procedures (SOPs) that are identical or similar to some SOPs currently in use. Those examples do not represent a rigid AAC view of best practices, which may vary among fleets and among certificate holders, and may change over time.

5.1.10.2 Some of the examples may be readily adapted to a certificate holder's flight crew training and operating manuals for various airplane fleets. Others may apply to a certain airplane fleet and may not be adaptable apart from that fleet.

5.1.10.3 In some cases a term shown in an appendix is a term used by a certificate holder or by a manufacturer not the equivalent term used by the AAC. Example: Where this guidance would use the term "height above touchdown," or HAT, the example shows that the certificate holder has used the term "above field elevation," or AFE.

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President of the Board

ANNEX A: STANDARD OPERATING PROCEDURES TEMPLATE

No template could include every topic that might apply unless it was constantly revised. Many topics involving special operating authority or new technology are absent from this template, among them ETOPS, PRM, SMGS, RNP, and many others.

The following are nevertheless viewed as examples of topics that constitute a useful template for developing comprehensive, effective SOPs:

- Captain's authority
- Use of automation:
    - The operator's automation philosophy;
    - Specific guidance in selection of appropriate levels of automation;
    - Autopilot/flight director mode control inputs;
    - Flight management systems inputs;
    - Monitoring of automated systems and Flight Mode Annunciator (FMA);
    - Cross checking of FMS routing with ATC clearance during pre-flight.
- Checklist philosophy:
    - Policies and procedures;
    - (Who calls for; who reads; who does);
    - Format and terminology;
    - Type of checklist;
    - Challenge-Do-Verify;
    - Do-Verify;
    - Walk-arounds.
- Checklists:
    - Safety check -- power on;
    - Originating/receiving;
    - Before start;
    - After start;
    - Before taxi;

  - Before take-off;
  - After take-off;
  - Climb check;
  - Cruise check;
  - Pre-landing;
  - Landing;
  - After landing;
  - Parking and securing;
  - Emergency procedures;
  - Non-normal/abnormal procedures.

- Communications
  - Who handles radios
  - -Primary language used
  - -ATC
  - -On the flight deck
  - -Keeping both pilots in the loop
  - -Company radio procedures
  - -Flight deck/cabin signals
  - -Cabin/flight crewsignals

- Briefings
  - CFIT risk considered
  - Special airport qualifications considered
  - Temperature corrections considered
  - Before takeoff
  - Descent/approach/missed approach
  - Approach briefing generally done prior to beginning of descent

- Flight crew access

  - On ground/in flight
  - Jump seat
  - Access signals, keys
- Flight crew discipline
  - PF/PM duties and responsibilities
  - Sterile cockpit
  - Maintaining outside vigilance
  - Monitoring/cross-checking
- Transfer of control
  - Additional duties
  - Flight kits
  - Headsets/speakers
  - Boom mikes/handsets
  - Maps/approach charts
  - Meals
- Altitude awareness
  - -Altimeter settings
  - Transition level
  - Callouts (verification of)
  - Minimum safe altitudes (MSA)
  - Temperature corrections
  - Monitoring during last 1000 feet of altitude change
- Report times
  - Check in/show up
  - On flight deck
  - Checklist accomplishment
- Maintenance procedures

  - Logbooks/previous write-ups
  - Open write-ups
  - Notification to maintenance of write-ups
  - Minimum equipment list (MEL)
  - Where it is accessible
  - Configuration Deviation List (CDL)
  - Crew coordination in ground de-icing
- Flight plans/dispatch procedures/takeoff and landing calculations
  - VFR/IFR
  - Icing considerations
  - Fuel loads
  - Weather package
  - Where weather package is available
  - Departure procedures climb gradient analysis
- Boarding passengers/cargo
  - Carry-on baggage
  - Exit row seating
  - Hazardous materials
  - Prisoners/escorted persons
  - Guns on board
  - Count/load
- Pushback/power back
- Taxiing
  - All engines running
  - Less than all engines running
  - On ice or snow
  - Prevention of runway incursion

- Crew resource management (CRM)
    - -Crew briefings
    - Cabin Crew
    - Flight crew
- Mass & balance/cargo loading
    - Who is responsible for loading cargo, and securing cargo
    - Who prepares the Mass & balance data form; who checks it
    - Copy to crew
- Flight deck/cabin crew interchange
    - Boarding
    - Ready to taxi
    - Cabin emergency
    - Prior to take-off/landing
- Take-off
    - PF/PM duties and responsibilities
    - Who conducts it
    - Briefing, IFR/VFR
    - Reduced power procedures
    - Tailwind, runway clutter
    - Intersections/land and hold short procedures (LAHSO)
    - Noise abatement procedures
    - Special departure procedures
    - Flight directors
    - Use of: Yes/No
    - Callouts
    - Clean up
    - Loss of engine

  - Transfer of control, if appropriate
  - Rejected takeoff
  - After V1
  - Actions/callouts
  - Flap settings
  - Normal
  - Non-standard and reason for
  - Crosswind
  - Close-in turns
- Climb
  - Speeds
  - Configuration
  - Confirm compliance with climb gradient required in departure procedure
  - Confirm appropriate cold temperature corrections made
- Cruise altitude selection
  - Speeds/mass
  - Position reports/pilot weather reports (PIREPs)
  - ATC – including PIREPs of hazards such as icing, thunderstorms, and turbulence Company
- Emergency descents
- Holding procedures
  - Procedures for diversion to alternate
- Normal descents
  - Planning and beginning of descent point
  - Risk assessment and briefing (see example, paragraph 1.G of this circular)
  - Speed brakes: Yes/No
  - Flaps/gear use verbalizing

  - Icing considerations
  - Convective activity
  - Ground proximity warning system (GPWS or TAWs)
  - Escape manoeuvre
- TCAS
- Wind shear
  - Avoidance of likely encounters
  - Recognition
  - Recovery / escape manoeuvre
- Approach philosophy
  - Monitoring during approach
  - Precision approaches preferred
  - Coordinate with ATC and plan ahead to avoid rushed approaches
  - Stabilized approaches standard
  - Use of navigation aids
  - Flight management system (FMS)/autopilot
  - Use and when to discontinue use
  - Approach gates
  - Limits for stabilized approaches
  - Use of radio altimeter
  - Go-arounds: Plan to go around on every approach; change plan to land when visual, or
  - when conditions permit in low-visibility operations – only if stabilized
- Individual approach type
  - All types, including engine-out
- For each type of approach
  - Profile

- Airplane configuration for conditions
- Visual approach
- Low visibility
- Contaminated runway
- Flap/gear extension
- Auto spoiler and auto brake systems armed and confirmed armed by both pilots, in accordance with manufacturer's recommended procedures (or equivalent approved company procedures)
- Actions and callouts

- Go-around / missed approach
  - When stabilized approach gates are missed
  - Actions and callouts (see example, Appendix 4)
  - Clean-up profile
- Landing
  - Actions and callouts during landing
  - Close-in turns
  - Crosswind
  - Rejected
  - Actions and callouts during rollout (see example, Appendix 18)
  - "No Spoilers" callout
  - Reverse thrust "Over boost" callout
  - Transfer of control after first officer landing

ANNEX B: STABILIZED APPROACH - CONCEPTS AND TERMS

A. A stabilized approach is one of the key features of safe approaches and landings in air carrier operations, especially those involving transport category airplanes.

B. A stabilized approach is characterized by a constant-angle, constant-rate of descent approach profile ending near the touchdown point, where the landing manoeuvre begins. A stabilized approach is the safest profile in all but special cases, in which another profile may be required by unusual conditions.

C. All appropriate briefings and checklists should be accomplished before 1000' height above touchdown (HAT) in instrument meteorological conditions (IMC), and before 500' HAT in visual meteorological conditions (VMC)

D.Flight should be stabilized by 1000' HAT in IMC, and by 500' HAT in VMC.

E. An approach is stabilized when all of the following criteria are maintained from 1000 HAT (or 500 HAT in VMC) to landing in the touchdown zone:

1) The airplane is on the correct track.

2) The airplane is in the proper landing configuration.

3) After glide path intercept, or after the final approach fix (FAF), or after the derived fly-off point (per Jeppesen) the pilot flying requires no more than normal bracketing corrections to maintain the correct track and desired profile (3° descent angle, nominal) to landing within the touchdown zone. Level-off below 1000' HAT is not recommended.

4) The airplane speed is within the acceptable range specified in the approved operating manual used by the pilot.

5) The rate of descent is no greater than 1000 feet per minute (fpm).

a) If an expected rate of descent greater than 1000 fpm is planned, a special approach briefing should be performed.;

b) If an unexpected, sustained rate of descent greater than 1000 fpm is encountered during the approach, a missed approach should be performed. A second approach may be attempted after a special approach briefing, if conditions permit.

6) Power setting is appropriate for the landing configuration selected, and is within the permissible power range for approach specified in the approved operating manual used by the pilot.

F. When no vertical guidance is provided: Vertical guidance may be provided to the pilot by way of an electronic glide slope, a computed descent path displayed on the pilot's navigation display, or other electronic means. On approaches for which no vertical guidance is provided, the flight crew should plan, execute, and monitor the approach with special care, taking into account traffic and wind conditions. To assure vertical clearance and situation awareness, the pilot not flying should announce crossing altitudes as published fixes and other points selected by the flight crew are passed. The pilot flying should promptly adjust descent angle as appropriate. A constant-angle, constant-rate descent profile ending at the touchdown point is the safest profile in all but special cases.

G. Visual contact. Upon establishing visual contact with the runway or appropriate runway lights or markings, the pilot should be able to continue to a safe landing using normal bracketing corrections, or, if unable, should perform a missed approach.

H. No visual contact. The operator may develop procedures involving an approved, standard MDA buffer altitude or other approved procedures to assure that descent below MDA does not occur during the missed approach. If no visual contact is established approaching MDA or an approved MDA buffer altitude, or if the missed approach point is reached, the pilot should perform the published missed approach procedure. Below 1000' HAT, levelling off at MDA (or at some height above MDA) is not recommended, and a missed approach should be performed.

Note 1: A correct track is one in which the correct localizer, radial, or other track guidance has been set, tuned, and identified, and is being followed by the pilot. Criteria for following the correct track are discussed in AAC Directives relating to Category II and Category III approaches. Criteria for following track in operations apart for Category II and Category III are under development.

Note 2: Normal bracketing corrections relate to bank angle, rate of descent, and power management. Recommended ranges are as follows (operating limitations in the approved airplane flight manual must be observed, and may be more restrictive):

i) Bank angle--- Maximum bank angle permissible during approach is specified in the approved operating manual used by the pilot, and is generally not more than 30°; the maximum bank angle permissible during landing may be considerably less than 30°, as specified in that manual.

ii) Rate of descent - ± 300 fpm deviation from target

iii) Power management - Permissible power range is specified in the approved operating manual used by the pilot

iv) Overshoots - Normal bracketing corrections occasionally involve momentary overshoots made necessary by atmospheric conditions. Such overshoots are acceptable. Frequent or sustained overshoots caused by poor pilot technique are not normal bracketing corrections.

ANNEX C: ATC COMMUNICATIONS AND ALTITUDE AWARENESS (EXAMPLES)

A. ATC Communications: SOPs should state who (PF, PM, FE/SO) handles the radios for each phase of flight, as follows:

1) PF makes input to aircraft/autopilot and/or verbally states clearances while PM confirms input is what he/she read back to ATC.

2) Instructions on the clarifications and acceptance of ATC clearance, particularly where terrain clearance is involved.

3) Any confusion in the flight crew is immediately cleared up by requesting ATC confirmation.

4) If any crewmember is off the flight deck, all ATC instructions are briefed upon his/her return. Or if any crewmember is off the flight crew all ATC instructions are written down until his/her return and then passed to that crewmember upon return. Similarly, if a crewmember is off ATC frequency (e.g., when making a PA announcement or when talking on company frequency), all ATC instructions are briefed upon his/her return.

5) Company policy should address use of speakers, headsets, boom mike and/or hand-held mikes.

6) Altitude Awareness: SOPs should state the company policy on confirming assigned altitude.

Example: The PM acknowledges ATC altitude clearance.

If the aircraft is on the autopilot then the PF makes input into the autopilot/altitude alerter. PF points to the input while stating the assigned altitude as he/she understands it. The PM then points to the input stating aloud what he/she understands the ATC clearance to be confirming that the input and clearance match.

If the aircraft is being hand-flown then the PM makes the input into the Altitude Alerter/autopilot, and then points to the input and states clearance. PF then points to the alerter stating aloud what he/she understands the ATC clearance to be confirming that the alerter and clearance match.

Example: If there is no altitude alerter in the aircraft then both pilots write down the clearance, confirm that they have the same altitude, and then cross off the previously assigned altitude.

ANNEX D: (EXAMPLE) ENGINE FAILURE AT OR ABOVE V1 - ACTIONS AND CALLOUTS

Callouts: in "BOLD TEXT" -- Actions: with bullets (•) in plain text		
Engine Failure	PF	PM
	•• Pilot first noting Engine Failure "ENGINE FAILURE" "SET MAX POWER"	•• Pilot first noting Engine Failure "ENGINE FAILURE" "SET MAX POWER" • Advance thrust levers to maximum takeoff thrust "POWER SET"
VR	• Rotate towards 10° pitch attitude	"ROTATE"
Positive rate of climb	• Verify positive rate of climb "GEAR UP"	"POSITIVE RATE" • Position gear lever UP
After lift-off	• Maintain F/D commanded attitude "ADVISE ATC," when appropriate •• Comply with airport specific "Engine Failure After Takeoff" procedure (if published); otherwise, fly runway heading "HEADING SELECT"	• Monitor speed and attitude • Advise ATC •• Comply with airport specific "Engine Failure After Takeoff" procedure (if published); otherwise, fly runway heading • Select HDG SEL • Verify HDG SEL annunciates • Position A/T arm switch OFF
Climbing through 1,000' AFE or obstruction clearance altitude (OCA), whichever is higher	"VERTICAL SPEED PLUS 100" • Reduce pitch and accelerate "FLAPS_____"	• Select VERT SPD to +100 FPM • Select proper flap setting, when requested
At flap retraction speed	"FLAPS UP"	• Retract flaps
At VREF 30 + 80	"FLIGHT LEVEL CHANGE, MAXIMUM CONTINUOUS THRUST, ENGINE _____ CHECKLIST, AFTER TAKEOFF CHECKLIST"	• Select FL CH • Press CON on TMSP • Set MCT "POWER SET" • Accomplish appropriate checklist "ENGINE _____ CHECKLIST COMPLETE" • Accomplish After Takeoff Checklist

ANNEX E: (EXAMPLE) PRE-FLIGHT

CAPTAIN	FIRST OFFICER
The first pilot on the flight crew will determine the aircraft maintenance status prior to actuating switches and controls.	
Brief the lead cabin crew (see FOM, circular 9). Accomplish the captain's pre-flight. After fuelling is complete, verify that the fuel load on board meets the requirements of the dispatch release and is adequate for the route of flight.	Accomplish the exterior pre-flight. Accomplish the first officer's pre-flight. Record the current ATIS information. Note: The captain may accomplish this step if it will expedite the departure process. When the fuel slip becomes available, review it for any discrepancies, and perform the reasonableness check (see FOM, circular 5). Verify that the fuel on board meets the requirements of the dispatch release and the flight plan. Check the ECAM FUEL page to verify the total fuel load and the proper distribution.
Obtain and print the ATC clearance using ACARS Pre-departure Clearance (PDC) procedures. If ACARS PDC is not available, obtain the ATC clearance using voice procedures at a time convenient to both crewmembers. The captain may ask the first officer to call for the clearance or the first officer may initiate the call after ensuring the captain is prepared to listen as the clearance is received. The captain will monitor the clearance as it is copied by the first officer.	
Verify that the proper clearance altitude and transponder code are set. Ensure that the cleared route is the active FMGC route, or modify as required.	Set the clearance altitude in the FCU ALT window. Set the transponder code. Verify that the cleared route is the active FMGC route.
Set the required navigation frequencies and courses for the departure. If required, use the RAD NAV page to modify the frequencies and courses. Caution: Frequencies and courses set by the pilot must be cleared when no longer required. Review the preliminary MGL (see FOM, circular 8). This will enable the crew to plan the anticipated runway, flap setting, and FLEX capability.	
At a convenient time prior to engine start, give a pilot briefing to ensure an understanding by both pilots as to the conduct of the flight (see FOM, circular 9).	
♦ Call for the PREFLIGHT CHECK. Verify, as appropriate, and respond to the PREFLIGHT CHECK.	
	Read, verify as appropriate, and respond to the PREFLIGHT CHECK. Announce "PREFLIGHT CHECK COMPLETE." If the takeoff mass data becomes available prior to engine start, complete the initialization on INIT page B. Insert ZFW and BLOCK FUEL.

ANNEX F: (EXAMPLE) CREW BRIEFINGS

Pilot Briefing

The purpose of the pilot briefing is to enhance communications on the flight crew and to promote effective teamwork. Each crewmember is expected to perform as an integral part of the team. The briefing should establish a mutual understanding of the specific factors appropriate for the flight.

A pilot briefing will be given prior to starting engines for the first flight of the day (subsequent flight, if applicable). The captain determines the length and detail of the briefing. Factors to consider include:

- Experience level of the pilots
- Special MEL procedures as a result of inoperative components
- Altimeter setting units
- Use of delayed engine start and/or engine out taxi procedures
- Presence of armed passengers, when applicable

When personnel occupy the extra crew seat(s), ensure they understand the use of oxygen/interphone operations and emergency exits, and sterile flight crew procedures.

Takeoff Briefing

A Takeoff Briefing will be given prior to takeoff. Factors to consider include:

- Takeoff weather conditions
- Runway surface conditions
- NOTAMS
- Departure review
- Obstructions and high terrain
- Closeout mass and balance message/takeoff numbers
- Critical conditions affecting the GO/NO GO decision (e.g., gross mass limited takeoff, wet or slippery runway, crosswind, aircraft malfunctions)
- Bird strike potential, if applicable

Cabin Crew Briefing

The purpose of the cabin crew briefing is to develop a team concept between the flight crew and cabin crew. An ideal developed team must share knowledge relating to flight operations, review individual responsibilities, share personal concerns, and have a clear understanding of expectations.

Upon flight origination or whenever a crew change occurs, the captain will conduct a verbal briefing, preferably with all the flight attendants. However, pre-flight duties, passenger boarding, rescheduling, etc. may make it impractical to brief the entire cabin crew complement. Regardless of time constraints, company policy is that the captain must brief the lead flight attendant. The briefing will be supplemented with a completed Cabin Crew Briefing Form.

The briefing should cover the following items:

- Logbook discrepancies that may affect cabin crew responsibilities or passenger comfort (e.g., coffee maker inop. broken seat backs, manual pressurization, etc.)

- Weather affecting the flight (e.g., turbulence – including appropriate code levels, thunderstorms, weather near minimums, etc.). Provide the time when the weather may be encountered rather than a distance or location (e.g., “Code 4 Turbulence can be expected approximately one hour after takeoff.”)

- Delays, unusual operations, non-routine operations (e.g., maintenance delays, ATC delays, re-routes, etc.)

- Shorter than normal taxi time or flight time which may affect pre-flight announcements or cabin service.

- Any other items that may affect the flight operation or in-flight service such as catering, fuel stops, armed guards, etc.

- A review of the sterile flight crew policy, responsibility for PA announcements when the Fasten Seat Belt sign is turned on during cruise, emergency evacuation commands, or any other items appropriate to the flight.

- During the briefing, the captain should solicit feedback for operational concerns (e.g., does each person understand the operation of the emergency exits and equipment). The captain should also solicit feedback for information which may affect expected team roles. Empower each crewmember to take a leadership role in ensuring all crewmembers are made aware of any potential item that might affect the flight operation.

- The lead cabin crew will inform the captain of any inoperative equipment and the number of flight attendants on board.

- The captain will inform the lead cabin crew when there are significant changes to the operation of the flight after the briefing has been conducted.

ANNEX G: (EXAMPLES) CREW MONITORING AND CROSS-CHECKING

Background

A. Several studies of crew performance, incidents and accidents have identified inadequate flight crew monitoring and cross-checking as a problem for aviation safety. Therefore, to ensure the highest levels of safety each flight crewmember must carefully monitor the aircraft's flight path and systems and actively cross-check the actions of other crew members. Effective monitoring and cross-checking can be the last barrier or line of defence against accidents because detecting an error or unsafe situation may break the chain of events leading to an accident. Conversely, when this layer of defence is absent, errors and unsafe situations may go undetected, leading to adverse safety consequences. It is difficult for humans to monitor for errors on a continuous basis when these errors rarely occur. Monitoring during high workload periods is important since these periods present situations in rapid flux and because high workload increases vulnerability to error. However, studies show that poor monitoring performance can be present during low workload periods, as well. Lapses in monitoring performance during lower workload periods is often associated with boredom and/or complacency.

B. Crew monitoring performance can be significantly improved by developing and implementing effective SOPs to support monitoring and cross-checking functions, by training crews on monitoring strategies, and by pilots following those SOPs and strategies. This Appendix focuses on the first of these components, developing and implementing SOPs to improve monitoring.

C. A fundamental concept of improving monitoring is realizing that many crew errors occur when one or more pilots are off-frequency or doing heads-down work, such as programming a Flight Management System (FMS). The example SOPs below are designed to optimize monitoring by ensuring that both pilots are "in the loop" and attentive during those flight phases where weaknesses in monitoring can have significant safety implications.

Review and modification of existing SOPs

A. Some SOPs may actually detract from healthy monitoring. Operators should review existing SOPs and modify those that can detract from monitoring. For example, one air carrier required a PA announcement when climbing and descending through 10,000 feet. This requirement had the unintended effect of "splitting the cockpit" at a time when frequency changes and new altitude clearances were likely. When the air carrier reviewed its procedures it realized that this procedure detracted from having both pilots "in the loop" at a critical point and consequently decided to eliminate it.

B. Another carrier required a company radio call to operations once the aircraft had landed. A critical review of procedures showed that this requirement, although sometimes necessary, had resulted in runway incursions because the first officer was concentrating on making this radio call and not fully monitoring the captain's taxi progress. The procedure was modified so that crews make this call only when necessary and then only once all active runways are crossed, unless unusual circumstances warrant otherwise (such as extensive holding on the ground.)

C. In addition to modifying existing SOPs, operators may consider adding sections to the SOP manual to ensure that monitoring is emphasized, such as:
High-level SOPs that send an over-arching message that monitoring is a very important part of cockpit duties.

Examples:

1. Change title of "Pilot Not Flying" (PNF) to "Pilot Monitoring" (PM).

2. The SOP document could explicitly state that monitoring is a primary responsibility of each crewmember.

Example:

Monitoring Responsibility

- □ The PF will monitor/control the aircraft, regardless of the level of automation employed.
- □ The PM will monitor the aircraft and actions of the PF.

Rational:
Several air carriers have made this change because they feel it is better to describe what that pilot should be doing (monitoring) rather than what he/she is not doing (not flying).

3. Although some SOP documents do define monitoring responsibilities for the PF, this role is often not explicitly defined for the PNF (PM). In many cases non-monitoring duties, such as company-required paperwork, PA announcements, operating gear and flaps, are clearly spelled-out, but seldom are monitoring duties explicitly defined for each pilot.

SOPs to support monitoring during airport surface operations

Examples:

1. Both pilots will have taxi charts available. A flight crewmember—other than the pilot taxiing the aircraft—should follow the aircraft's progress on the airport diagram to ensure that the pilot taxiing the aircraft is following the instructions received from ATC.

2. Both pilots will monitor taxi clearance. Captain will verbalize to FO any hold short instructions. FO will request confirmation from Captain if not received.

3. When approaching an entrance to an active runway, both pilots will ensure compliance with hold short or crossing clearance before continuing with non-monitoring tasks (e.g., FMS programming, Airborne Communications Addressing and Reporting System (ACARS), company radio calls, etc.).
Rational: Pilot-caused runway incursions often involve misunderstanding, not hearing a clearance or spatial disorientation. These SOPs are designed to do several things.

4. The requirement for both pilots to have taxi charts out ensures that the pilot who is not actively taxiing the aircraft can truly back-up the pilot who is taxiing.

5. Requesting that both pilots monitor the taxi clearance and having the captain verbalizes any hold short instructions is a method to ensure that all pilots have the same understanding of the intended taxi plan.

6. The requirement to suspend non-monitoring tasks as the aircraft approaches an active runway allows both pilots to monitor and verify that the aircraft stops short of the specified holding point.
SOPs to support improved monitoring during vertical segments of flight (also refer to Appendix 3 of this document, "ATC Communications and Altitude Awareness")

Examples:

1. PF should brief PM when or where delayed climb/descent will begin.

2. Perform non-essential duties/activities during lowest workload periods such as cruise altitude or level flight.

3. When able, brief the anticipated approach prior to top-of-descent.

4. During the last 1,000 feet of altitude change both pilots should focus on the relevant flight instruments to ensure that the aircraft levels at the proper altitude. (When VMC one pilot should include scanning outside for traffic; however, at least one pilot should focus on ensuring that the aircraft levels at the proper altitude.)
Rational: A study on crew monitoring conducted by NASA Aviation Safety Reporting System (ASRS) revealed that three-quarters of the monitoring errors in that study occurred while the aircraft was in a vertical phase of flight, i.e., climbing, descending or approach. These SOP statements ensure that proper attention can be devoted to monitoring during vertical phases of flight.

5. The ASRS monitoring study highlighted that a number of altitude deviations occurred when crews were given an altitude crossing restriction, but then failed to begin the descent in a timely manner. Briefing the anticipated top-of-descent point, not only promotes healthy CRM, but also allows the other pilot to “back up” the planned descent point and ensure the descent begins at the proper point. Example: “We'll begin our descent at 80 DME.”

6. Studies likewise show that in order to minimize the chance of a monitoring error, crews should schedule performance of non-essential duties/activities during the lowest workload periods, such as cruise altitude or level flight.

7. Briefing the anticipated instrument approach prior to descent from cruise altitude allows greater attention to be devoted to properly monitoring the descent because the crew does not have to divide attention between reviewing the approach and monitoring the descent. It also allows greater attention to be devoted to the contents of the approach briefing, which can increase situation awareness and understanding of the intended plan for approach and landing.

8. Many altitude deviations occur because pilots are not properly monitoring the level off. This SOP statement is to ensure that pilots concentrate on ensuring the aircraft levels at the proper altitude, instead of being distracted by or performing non-monitoring tasks.

SOPs to support improved monitoring of automation

Examples:

1. Before flight, the routing listed on the flight release must be cross-checked against the ATC clearance and the FMS routing.

2. When making auto flight systems inputs, comply with the following items in the acronym CAMI:

Confirm FMS inputs with the other pilot when airborne

Activate the input

Monitor mode annunciations to ensure the auto flight system performs as desired

Intervene if necessary.

3. During high workload periods FMS inputs will be made by the PM, upon the request of PF. Examples of high workload include when flying below 10,000 feet and when within 1000 feet of level off or Transition Altitude.

4. Pilots should include scanning of the Flight Mode Annunciator as part of their normal instrument scan, especially when automation changes occur (e.g., course changes, altitude level off, etc.).
Rational:
It is not unusual for the routing that is loaded in the FMS to be different from the routing assigned by ATC, especially in those cases where the flight plan is up linked directly into the FMS, or when an FMS stored company route is used. Various studies have demonstrated that FMS programming errors made during pre-flight are not likely to be caught by flight crews during flight. Therefore it is critical that these items be cross-checked before takeoff.

5. The above-mentioned ASRS monitoring study found that 30 percent of the monitoring errors in that study's dataset occurred when a crewmember was programming a Flight Management System (FMS). Another NASA-funded study showed that even experienced pilots of highly automated aircraft sometime fail to adequately check the Flight Mode Annunciator to verify automation mode status. The acronym "CAMI" can be used to help emphasize cross-checking of automation inputs, monitoring and mode awareness.

6. The statement concerning FMS inputs during high workload allows the PF to concentrate on flying and monitoring by simply commanding FMS inputs during highly vulnerable times. Several ASRS reports indicate problems with failure to level-off and failure to reset altimeters to proper settings. Therefore, the definition of "high workload" should include those vulnerable phases.

7. Automated flight guidance systems can have mode reversions and can sometimes command actions that are not anticipated by pilots. Therefore, pilots should include the Flight Mode Annunciator into their normal instrument scan. Special attention should be given to periods of course changes, altitude level off, etc.)

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