

CIVIL AVIATION AUTHORITY PAKISTAN **FLIGHT STANDARDS DIRECTORATE**



This Information Bulletin, adopted by Flight Standards Directorate aims to keep members of Pakistani Civil Aviation community updated on latest items of common interest and developments within the aviation industry. It is anticipated that, the bulk of material would be of relevance to AOC, Training, Standards and helpful to the Safety Managers who implement their policies.

The Bulletin is designed to serve the objective of Flight Standards Directorate that is "To improve upon Safety Standards".

INFORMATION BULLETIN

ADHERENCE TO SOPs

Background

Adhering to [standard operating procedures](#) (SOPs) is a personal quality that can profoundly influence flight safety. This briefing note provides information every pilot should understand about the origin of SOPs and the critical importance of following them unfailingly during operations.

Introduction

Strict adherence to SOPs, including always effectively running normal checklists, is an effective method to enhance the safety of ground and flight operations by preventing or mitigating crew errors and by anticipating or managing operational threats. Faithfully following SOPs is an important part of the implementation of good [crew resource management](#) (CRM).

This briefing note provides an overview of:

- Establishing and using SOPs
- Training flight crews to follow SOPs
- Factors and conditions that may affect compliance with published rules and procedures

Data

Data have been tabulated on the factors that cause approach and landing accidents. Table 1 shows the percentage of studied accidents that involved various causal factors related to either understanding or following SOPs. It is clear from the table that many accidents have causes related to problems with SOPs.

Factors in Understanding and Adhering to SOPs	Percentage of Events
Omission of action or inappropriate action	72%
Nonadherence to criteria for stabilized approach	66%
Inadequate crew coordination, cross-check and backup	63%
Insufficient horizontal or vertical situational awareness	52%
Inadequate or insufficient understanding of prevailing conditions	48%
Slow or delayed action	45%
Deliberate nonadherence to procedures	40%
Incorrect or incomplete pilot/controller communication	33%
Ineffective interaction with automation	20%
Absence of go-around when required	17%

Table 1 - Causal Factors Involving SOPs in Approach and Landing Accidents (Flight Safety Foundation 1998–1999)

Manufacturer-Provided SOPs

SOPs published by manufacturers are designed to:

- *Reflect the cockpit-design and operating philosophies of the manufacturer*
- *Promote the maximally effective use of aircraft-specific design features*
- *Apply to a broad range of airline operations and operating environments with the objectives of standardizing crew behavior and ensuring that all required safety-related actions are followed*

The first SOPs for a new aircraft model are typically based on:

- *Lessons learned from previous operating experience*
- *Analysis performed during design*
- *Experience gained during development and certification flight testing*
- *Experience from the route-proving program*

After new aircraft are introduced into service, initial SOPs are periodically reviewed and enhanced based on feedback from end users. This feedback includes reports on the use of SOPs in training, line operations and incident and accident analyses.

Customized SOPs Developed by Operators

Manufacturer-provided SOPs can be adopted without change by an airline or used as the basis for the development of customized SOPs that promote standardization across the different aircraft fleets in service at the airline. The level of any expanded information included by an airline should be tailored to reflect that airline's operating and training philosophies.

An airline can also deviate from manufacturer-provided SOPs, if necessary. Before the SOPs provided by the manufacturer can be changed, however, the change must be reviewed and coordinated with the manufacturer. Deviations also typically require approval by the airline's operational authority.

There are several reasons why an airline may have to review and update its SOPs. First, an airline's SOPs must be reviewed and reassessed whenever there is a revision to the manufacturer-provided SOPs. Second, updates to an airline's SOPs may be prompted by internal company feedback. Regardless of what prompted the need for a revision, each proposed change in SOPs must be coordinated with the manufacturer and the airline's operational authority.

Line pilots and cabin crewmembers should be involved in the development and revision of company SOPs, along with the flight standards team. This involvement helps to:

- *Promote critical and constructive feedback*
- *Ensure that rules and procedures, as well as reasons for their adoption, are fully understandable by end users*

Scope of SOPs

General principles

- SOPs should identify and describe the standard tasks and duties of a flight crew for each flight phase, including what to do and when to do it.
- SOPs should be simple, clear, concise and prescriptive.

SOPs should be designed to be accomplished without an aid to recall, such as a checklist. Critical tasks (e.g., selections of systems, changes to aircraft configuration), however, must also include a cross-check for errors through use of normal checklists according to the phase of flight.

- SOPs (including [standard calls](#)) should provide the basis for crew standardization and establish a working environment conducive to enhanced and efficient crew communication and coordination.
- SOPs should be supplemented as needed by relevant information on specific operating techniques (e.g., adverse weather operation) and by operational recommendations for specific types of operations (e.g., operations on wet or contaminated runways, operations in extended operations [ETOPS](#) areas, operations in reduced vertical separation minimum ([RVSM](#)) airspace).
- SOPs should assume that all aircraft systems are operating in an acceptable manner and that all automatic functions are used as intended. SOPs are for the vast majority of situations in which nothing related to the flight is out of the ordinary range of conditions encountered in the airline's operations.

Note: A system may be partially or totally inoperative in accordance with a company's [minimum equipment list](#) (MEL)/dispatch deviation guide (DDG) without affecting the SOPs. Dispatch with an acceptable loss of redundancy or function (e.g., an inoperative auxiliary power unit ([APU]) is a "standard" condition as envisioned by SOPs.

SOPs should address and emphasize critical and recurring operational topics, including:

- Task sharing (who should do)
- Optimum use of automation (how to use)
- Operations golden rules
- Standards calls (what to expect, what to observe)
- Use of normal checklists
- Abort and Engine inoperative procedures
- Approach and go-around briefings
- [Altimeter setting and cross-check procedures](#)
- Use of the radio altimeter
- Descent profile management
- Energy management
- Terrain awareness
- Threat and hazard awareness
- Elements of a [stabilized approach](#) and approach gates
- Approach procedures and techniques for various types of approaches
- Landing and braking techniques for various types of runway and wind conditions
- Readiness and commitment to go around (e.g., [ground-proximity warning system](#) [GPWS] warning, unstabilized approach, bounce recovery).

Safeguards

SOPs should contain safeguards in order to minimize the potential for inadvertent deviation from procedures, particularly when operating under [abnormal or emergency conditions](#) or after [interruptions or distractions](#).

Safeguards include:

- Action blocks:
 - A collection of actions to be accomplished in sequence and always performed as a group
- Triggers:
 - Events or actions that initiate action blocks
- Action patterns:
 - Flight deck panel scanning sequences or patterns supporting the flow and sequence of action blocks
- Standard calls:
 - [Standard phraseology](#) and terms used for effective crew communication

Task sharing

Rules for effective task sharing apply to any flight phase but are particularly important in the high-workload phases associated with takeoff, departure, climb and approach and landing. Two important universal principles or rules are:

- The [pilot flying \(PF\)](#) is responsible for controlling the vertical and horizontal flight paths and for energy management by either:
 - Supervising the [autopilot](#) (AP) vertical and lateral guidance and the autothrottle/autothrust operation. This necessitates awareness of selected guidance targets, modes being armed or engaged, and mode changes through mode transitions and reversions.
 - Hand flying the aircraft with or without flight director (FD) guidance and with or without autothrottle/autothrust assistance
- The non-flying pilot has a dual role as pilot not flying (PNF) and pilot monitoring (PM). He or she is responsible for systems-related and monitoring tasks, and for performing the actions requested by the PF, including:
 - Radio communications
 - Systems selection and configuration
 - AP/FD and [flight management system](#) (FMS) mode selections and target entries when the PF is hand flying the aircraft
 - Monitoring the status of the aircraft (e.g., configuration, attitude, speed, trajectory)
 - Performing the actions called for by electronic and paper checklists in abnormal and emergency conditions
 - Monitoring the PF to provide effective backup, as required (e.g., standard calls, excessive-deviation callouts)

Sterile cockpit rule

The sterile cockpit rule, is an important SOP that may be mandated by operational authorities or adopted in accordance with company policy. The rule specifically prohibits crewmembers from performing nonessential duties or activities while the aircraft is involved in taxi, takeoff, landing and all other flight operations conducted below 10,000 feet, except cruise flight.

Manufacturers encourage adherence to the sterile cockpit rule, regardless of applicable national requirements.

Silent cockpit policy

The sterile cockpit rule and the silent cockpit concept are often confused. There is even the mistaken belief that they refer to the same operating policy. When adhering to a silent cockpit policy, standard calls are minimized. Autopilot mode selections and target entries, flight mode annunciator changes and target confirmations on the primary flight display (PFD) and navigation display (ND) are not announced aloud but are included by procedure in the instrument scan.

Manufacturers acknowledge that variations may exist in airline operating policies, but they encourage operators to adopt and adhere to a standard calls policy, as defined in the briefing note Standard Calls.

Use of automation

With higher levels of automation available on modern aircraft, flight crews are offered an increasing number of options and strategies to choose among for accomplishing flight tasks. Company SOPs should accurately define the automation options and strategies selected by the airline for various flight phases and for various types of approaches.

The briefing note [Automated Cockpit Guidelines](#) provides expanded information on the use of the AP/FD, autothrottle/autothrust and FMS.

Training Aspects

Disciplined use of SOPs and normal checklists should begin during the transition training course because habits and routines acquired during transition training have been proved to have lasting effect.

Transition training and recurrent training provide unique opportunities to discuss both the reasons for rules and procedures and the consequences of failing to comply with them. Conversely, allowing relaxed adherence to SOPs and/or a relaxed use of normal checklists during initial or recurrent simulator training may encourage corresponding deviations during line operations.

Both the airline and the individual pilot must remember to:

Train as you fly, fly as you train!

Operational and Human Factors Involved in Deviations from SOPs

To ensure effective compliance with published SOPs, it is important to understand why pilots intentionally or inadvertently deviate from rules or standards. In most cases of deviation from SOPs, the procedure that was followed in place of the published procedure seemed to be appropriate for the prevailing situation, considering the information available at the time. But, in fact, it was inappropriate or at least suboptimal. The following factors and conditions are often cited as making it more likely that a deviation from SOPs will occur:

- Corporate culture (e.g., the absence of company management's clear commitment to SOPs and standardization)
- Ineffective or unclear company or airworthiness authority policies (e.g., regarding schedules, costs, go around, diversion, crew duty time)
- Inadequate knowledge of or failure to understand the rule, procedure or action

(e.g., quality of wording or phrasing; rule, procedure or action being perceived as inappropriate)

- Insufficient emphasis on strict adherence to SOPs during transition and recurrent training
- Insufficient vigilance (e.g., due to fatigue)
- [Distractions](#) (e.g., due to cockpit activity)
- [Interruptions](#) (e.g., due to ATC communication)
- Task saturation resulting in degraded multi-tasking ability or task overload
- Incorrect management of priorities (e.g., lack of or incorrect decision-making model for time-critical situations)
- Reduced attention (e.g., due to tunnel vision) in abnormal or high-workload conditions
- Incorrect [CRM](#) techniques, especially the absence of cross-checking, crew coordination or effective backup
- Personal desires or constraints (e.g., personal schedule, press-on-itis)
- Complacency
- Overconfidence

The awareness that these factors can influence adherence to SOPs may be useful to you in assessing your company and personal exposure, and in developing corresponding prevention strategies and lines of defense.

Key Points

- SOPs enhance flight safety by helping flight crews conform their actions to recommendations by aircraft manufacturers and by standardizing operations within an airline.
- SOPs should include and emphasize aspects that avoid errors and deviations that are frequently associated with incidents and accidents.
- Company policies, technical training, CRM training programs, line checks and line audits should:
 - Promote strict adherence to SOPs
 - Identify and address the reasons for intentional or inadvertent deviations from SOPs

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