



SOP – The Last Line of Defence

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**NCAA PRESENTATION BY
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What is an SOP?

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- In General

A standard operating procedure is a set of written instructions that describes the step-by-step process that must be taken to properly perform a routine activity.

- In Aviation

SOPs enhance flight safety by helping flight crews perform actions congruently and according to standardised recommendations by aircraft manufacturers and within an airline. SOPs should include and emphasize aspects that avoid errors and deviations that are frequently associated with incidents and accidents.

Regulations and Reference

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NAMCARS

121.08.2

127.08.2

135.08.2

ICAO DOC 9376

ICAO DOC 8168 (PANS-OPS) VOL 1

ICAO DOC 8168 (PANS-OPS) VOL 2

ICAO ANNEX 6 - OPERATIONS

ICAO DOC 10011

- For many years the International Civil Aviation Organization (ICAO) has identified **deficiencies** in standard operating procedures (SOPs) as contributing or causal factors in aviation **accidents**. Among the most commonly cited deficiencies involving flight crews has been their non-compliance with established procedures as well as the non-existence of established procedures in some manuals used by flight crews.
- ICAO has recognized the importance of SOPs for safe flight operations. Thus, recent amendments to ICAO Annex 6 and PANS OPS Document 8168, Vol I, establish that each Member State shall require that SOPs for each phase of flight be contained in the operations manual used by pilots.

- Standard operating procedures (SOPs) are universally recognized as being basic to safe aviation operations.
- 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.
- AOC holders are also reminded that it is each operator's responsibility to have their SOPs approved by NCAA (Namibia Civil Aviation Authority) and the said SOPs should be developed taking into account guidance from the Aircraft Manufacturers, Authorities, ICAO, industry organisations such as IATA, and other available guidance material.

Frequency of Revisions and Reviews

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- SOPs need to remain **current** to be useful. Therefore, whenever procedures are changed, SOPs should be updated and re-approved. If desired, modify only the pertinent section of an SOP and indicate the change date/revision number for that section in the document control notation (List of Effective Pages).
- The review process should not be overly cumbersome to encourage timely and regular review. The minimum **frequency of review** should be indicated by management in the organization's Quality Management Plan. That plan should also indicate the individual(s) responsible for ensuring that SOPs are current.

SOP Document Tracking and Archival

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The organization should maintain a master list of all SOPs. This file or database should indicate the SOP number, version number, date of issuance, title, author, status, organizational division, branch, section, and any historical information regarding past versions. The QA Manager (or designee) is generally the individual responsible for maintaining a file listing all current quality-related SOPs used within the organization.

- We can not stress enough the importance of **proper** training regarding SOPs.

Simply because :

When flight crew members 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.

They are better **prepared** and more eager to offer effective feedback for **improvements**. The AOC 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**.

How do airlines benefit from adhering to Standard Operating Procedures ?

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By adhering to SOPs, the airline ensures its aircraft are flown correctly per the manufacturer's guidelines. Furthermore, airlines utilize aircraft resources and functionality appropriately



- Some users of the National Airspace System live by Standard Operating Procedures (SOPs), and some do not. This is arguably the most significant difference between air carriers and general aviation when it comes to training, testing, and cockpit cultures
- This is also, by some measures, a factor in accounting for the differences in accident rates. General aviation, particularly the **single-pilot, personal-flying kind**, relies **not** on the use of SOPs, but basic personal minimums for **Aeronautical Decision Making (ADM)**.).
- As these aren't standardized or even **required**, personal minimums offer little by way of an overall approach to flight discipline or ADM. It's time for GA to start using full-fledged SOPs to spread the benefits of this operating philosophy to everyone in the system

- Personal minimums combined with cockpit checklists are the closest most of us flying under **Part 91** get to SOPs today. While personal minimums are highly encouraged, they fail to cover many aspects encountered in a typical IFR flight.
- **Most models** are built assuming that everything works **normally**, and weather develops as forecast. Plus, personal minimums naturally vary widely, resulting in a broad spectrum of what conditions are acceptable for individual users. Of course, it's far better for a pilot to recognize his or her own limitations based on proficiency, currency, and equipment than to casually fly all the way to minimums on a soupy, windy day. But more needs to be done to **give pilots the tools to make decisions in all phases of flight**, as well as to encourage **consistency in the cockpit**.

Accidents and Incidents

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Neglecting to use standard operating procedures, or lacking them entirely, has been the common thread in Part 121 and 135 flight accidents, the NTSB found. For example, examination of 86 turbine aircraft accidents with 149 fatalities between 2001 and 2010 found a “lack of adequate procedures, policies, or checklists” and a “lack of flight crew adherence to procedures, policies, or checklists” as contributing causes.



Accidents and Incidents

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On the 06th May 2022, at around 16:35 UTC a privately owned, Namibian registered Helicopter got airborne after it drop off passengers at a helipad with the intention of ferrying the helicopter to the hangar for parking. On Board was a pilot the sole occupant.

According to the pilot, after dropping off the two passengers, the passengers proceeded to the awaiting vehicle that was parked 18 meters away from the helicopter at 11 o'clock position relative to the helicopter nose. The pilot further stated that he started the aircraft with the intention of ferrying it to the hangar which was around 1.6 miles from the helipad. The Helicopter was facing in the westerly direction. After the aircraft took off and slightly climbed while turning to the left, the pilot misjudged the distance of the tip blades and the parked vehicle. Two of the blades struck the vehicle's top and thereafter the aircraft lost control, touch down with the left hand skid and roll to the left.

Probable Cause: Loss of control (LOC).

Contributing factor: Main rotor blades striking the vehicle, Inadequate operational safety guidelines



Figure 1: Picture showing damage to the aircraft especially to the main transmission system.



Figure 2: Picture showing the rotor head that broke off from the mast.

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Accidents and Incidents

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On the 27th November 2021, at around 05H45 UTC time a privately owned, Namibian registered aircraft got airborne from Farm Kalakwa for a private flight to Eros Airport. On Board was the pilot and two passengers.

The flight was uneventful for most of the journey. Upon final approach at Eros airport and cleared to land runway 01. The pilot selected undercarriage down position, immediately after the undercarriage down position was selected the aircraft experience a total electrical failure. The pilot tried to revive the electrical system but all effort ended up in vain. The pilot decided to deploy the undercarriage using the manual (emergency) extension System but fail to get the landing gear down and lock. After several teardrops on both runways (runway01 and 19) trying to lower the undercarriage failed. The pilot decided to make an emergency landing. The emergency landing was carried out on runway 19. The aircraft first touchdown on the runway was 40 meters from threshold and it came to a completely stop about 146 meters from the first touchdown point. The pilot shut down the engine and evacuated the aircraft together with the two passengers unharmed.

Probable Cause:

Inadequate operating knowledge of the Manual (emergency) landing gear extension system which resulted in failure to execute the landing gear extension.



Figure 4: Depicting where the aircraft came to a completely stop on the runway.

Accidents and Incidents

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HANDLING A TECHINICAL FAULT

During the take-off roll close to rotation there was a single solid clunk sound followed by a scraping sound. This happened as the pilot was about to rotate so takeoff was continued. Another aircraft and ATC reported what appeared to be that the right hand wheel had come off. The pilot did a fly-past of the tower to double-check, then routed to Eros and requested a hold over Goreangab Dam. The pilot consulted the POH and decided to follow the procedure for landing with a flat main wheel. He got as many passengers as possible to sit on the left side of the cabin and burnt fuel from the right -hand tank to lighten the weight on the side of the aircraft with no wheel. Holding allowed the pilot to be fully prepared for the landing attempt. He asked the passengers to review the safety card. He then requested to land on runway 19 since the wind was predominantly easterly, allowing me to dip the left wing into the wind and land on the left wheel whilst maintaining runway track.

The uphill slope of the runway would also assist in stopping the aircraft, despite the light tailwind component. Attempting a landing on the opposite runway would have made it difficult to maintain runway track. During the hold, the pilot allowed two aircraft to depart from Eros before the aerodrome was closed for his landing attempt. On final approach, he commanded the passengers to brace, thereafter was able to land the aircraft on the left wheel only, applying left rudder and left brake to help stay straight once the right side made contact with the runway, and using reverse thrust to slow down. As the speed lowered, the aircraft started veering to the right-hand edge of the runway. The pilot then feathered the propeller and cut the fuel to shut down and secure the engine before possibly going onto the grass, but the aircraft came to a stop on the runway. He secured the aircraft further whilst the passengers evacuated out the rear-right door, and then evacuated as the final occupant. The fire and medical crew arrived on the scene immediately. Nobody was injured. The outer wheel hub of the wheel assembly and the tyre were missing (assembly bolts sheared off), and the only visible damage to the aircraft was to the remaining right inner wheel assembly.

Congrats!

Prepared by :
SPQ/OPS

**A JOB WELL
DONE**

It's not often we have positive case to share, and it is important that we do so others we can all learn about ideal handling of events. We are proud to share this very positive example of how an event should be handled.

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Final Remarks

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- Remember that the checklist is not the SOP, but a part of the SOP
- 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.
- “**Well-designed** cockpit procedures are an effective countermeasure against operational errors, and disciplined compliance with SOPs, including strict cockpit discipline, provides the basis for effective crew coordination and performance.”

In Conclusion ...

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- ✓ What comes with the aircraft (POH) will never cover everything that SOPs can offer—real ground rules and clear parameters to aid in decision making, and clear procedures for carrying out the resulting actions. This is why the non-users of SOPs often make inconsistent or late decisions, pick up bad habits in cockpit management and show great deficiencies during emergencies, when they do occur .

- Questions?