Compliance to Operational Procedures

Why do well trained and experienced pilots not always follow procedures?

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1 Introduction

In the aviation domain, the purpose of introducing procedures was to enhance safety in normal and abnormal conditions, by reducing uncertainty and thus risks. The rationale was obvious, and the benefits so blatant that the aeronautical industry has been using procedures for many years. It is now undisputed that pilots shall adhere to the procedures designed for them. But real life is not always that simple.
The objective of this article is to understand the complete picture: good procedures design is important as well as appropriate explanations to ensure pilots have sufficient confidence in their skills and judgment to manage the situation.

Each procedure is designed as the best and safest way to do a given task. Flight deck procedures are the skeleton of flight operations. They are the structure and the organisation by which a pilot can fly and interact with the aircraft and other crewmembers.

For years, everybody has shared that same idea that safety will be guaranteed if pilots are selected and trained, so as to strictly apply procedures.

The method was:

- **tell them**
- **train them**
- **enforce them**

to follow procedures.

When incidents or accidents occur, most of the time a non-adherence to procedures is mentioned. But this is not sufficient to explain accidents, because every day pilots do not follow procedures and this does not always lead to accidents!

2 | Role of procedures

Everybody knows the obvious role of procedures as a guide for action (individual and collective guide). It tells the pilot

- What to do
- When to do it
  - Sequence, order, synchronisation
- How to do it
- Who should do it
  - Organised task sharing
- What to observe and what to check
- What type of feed back is provided to the other crewmember

But procedures also have additional safety functions, which sometimes are not taught and explained well enough:

They support:

1) Situation awareness and anticipation

a) They support a shared plan of action and shared awareness. The organised task sharing creates a shared action plan, that will be the "mental template" to act, synchronize actions and manage time. Thus, this shared action plan will be a support to build and manage situation awareness.

b) The call out which represents a collective reading of the procedure is a basement for coordination.

2) Decision making by providing

a) Elements of diagnosis to prepare the action,

b) Elements of execution,

c) Elements of control: cautions, what to do under different conditions and what to check.

3) Error management

a) Guideline prevents the likeliness of errors,

b) Common reference allows error detection. Built around an organised task-sharing, the procedures allow each crewmember to stand back from the actions performed by the other one, which gives a kind of "fresh eye" on the tasks performed by the other crewmember.

4) Support risk management within complex and dynamic situations

3 | Procedures implementation

Not everything is predictable, and there is no magic in procedures. Mismatches do exist between procedures and actions. Implementing a procedure is not a simple automatic process.
A procedure implementation is by nature different from the procedure itself: the first one is an action, the second one is an instruction. The procedure specifies the tasks, then the pilot will have his/her own way for implementing the task.

Human performance is not stable, and can be impaired by a variety of factors such as fatigue, stress, workload or operational pressure. This can impair procedure implementation. This is why it is important to understand the triggering factors behind procedure deviations in order to minimize them.

Most of the time, crew action includes much more than what is written. It requires sophisticated mental functions such as:

1) Understanding the situation

This requires an organized perception and good situation awareness, which means a clear and up-to-date understanding of what is going on around the crew

2) Understanding the procedure and its meaning

3) Ensuring that all pre-conditions are checked

4) Anticipating the expected results

This is possible because pilots do more than just follow procedures. A procedure is more that a mere instruction: it refers to the pilot's own skills and experience, his "good judgment", "common sense" and "airmanship". Confidence in oneself, in the aircraft and in the other crewmember is paramount because it supports decision and action.

5) Ensuring that all actions requested by the procedures are performed in the right order, with good judgment and with good synchronization between crewmembers

This requires dedicated skills. It is thus linked to the pilot's knowledge of his own skills, his self-confidence, his confidence in the other crewmember and in the airplane. It also implies the ability to manage time and priorities.

4 | Role of managers

Once a procedure is designed and disseminated, the managers' duties are not over. They also have responsibility for how the pilots use them. The pilots should be convinced that procedures are useful and relevant to the situation.
The probability for an instruction to be followed is based on:

- the perceived risk
- the user's knowledge
- the situation
- the presentation of information
- the user's attitude

This means that procedures need to be explained and taught at all phases of pilot activities.

While developing procedures, airline managers may use the **4Ps model**.

- **Philosophy:**
  is the over-arching view of the top management on how they conduct the business.
- **Policies:**
  are a broad specification of the way the management expects things to be done. For example, the commercial role of the Captain to stand at the cockpit door when passengers disembark will influence the "Shut down" procedure, to be then performed by the Copilot alone.
- **Procedures**:
  shall be consistent with the policies and overall philosophy.
- **Practices:**
  cover all flight deck activities.

If philosophies and policies are articulated, then it will be easier to generate logical and consistent procedures, and it will allow detecting the discrepancies and inconsistencies between procedures.

While the lack of procedures may generate risk and poor standards and standardisation, too many of them will sometimes create complacency.
Alike, pilots experiencing trouble with a specific procedure may end up with lack of confidence in all other procedures. *"I have already experienced this, I know a better way to do the task".*

The rationale for procedure changes should be documented and explained. Human beings often resist a change if they do not understand its justification and benefits (whether in terms of effectiveness or safety).

The level and type of explanations should be adapted to the context. When transitioning onto a new type, the focus will be on the link with design principles. Recurrent training will rather focus on routine situations, emergency situations and return of experience.

In some circumstances, the role of airmanship and good judgment should be clarified.

Example: Land ASAP

Even in this situation (red warning), procedures do not decide on behalf of the crew. The level of emergency and the time available should be evaluated. Crew good judgment and decision are based on the time available, the type of failure, the flight situation and the environment (weather, characteristics of surrounding terrain, etc…)

Sometimes, the main reasons behind the procedures should be explained.

For example, in case of **Tail pipe fire**

The flight crew must perform the following actions:
Shut down the engine
(MASTER switch set to OFF)
Do NOT press ENG FIRE pushbutton

Why? Because (FCTM02.03):

- *this would stop power to the FADECs and would stop the motoring sequence*
- *the fire extinguisher must no be used, as it will not extinguish any internal engine fire*
- *as a first priority, the engine must be ventilated*

5 Conclusion

To repeat: *"Follow procedures"* is not sufficient. Not even the best procedures can be considered perfect. Extensively tested before implementation, SOPs are the outcome of a lot of expertise. However, the environment is dynamic, and procedures can only provide baselines. No set of procedures can substitute for human intelligence and flight experience.

SAFETY
=
Safe aircraft
+ procedures
+ pilot's competence as an ability to manage the expected and unexpected

Safety First

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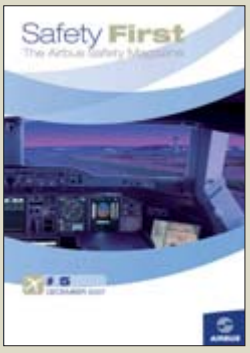

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