

Maintenance Standards Improvement Team:
Large Maintenance Repair and Overhaul Group



A procedure to write a procedure: A guide developed by the airworthiness industry

CAP 1798



Published by the Civil Aviation Authority, 2019

Civil Aviation Authority
Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

You can copy and use this text but please ensure you always use the most up to date version and use it in context so as not to be misleading, and credit the CAA.

First published May 2019

Maintenance Standards Improvement Team: Large Maintenance Repair and Overhaul Group

(MSIT Large MRO group)

The large fixed wing maintenance organisations improvement team include a number that support airlines, such as British Airways, TUI, Flybe and also some MRO's that provide contracted support to other airlines. The group recognised the continual challenges of staff following procedures, and with this in mind have developed the guidance to improve the ability for staff to follow and comply with procedure in place within organisations.

Enquiries regarding the content of this publication should be addressed to: airworthiness@caa.co.uk

The latest version of this document is available in electronic format at: www.caa.co.uk/CAP1798

Contents

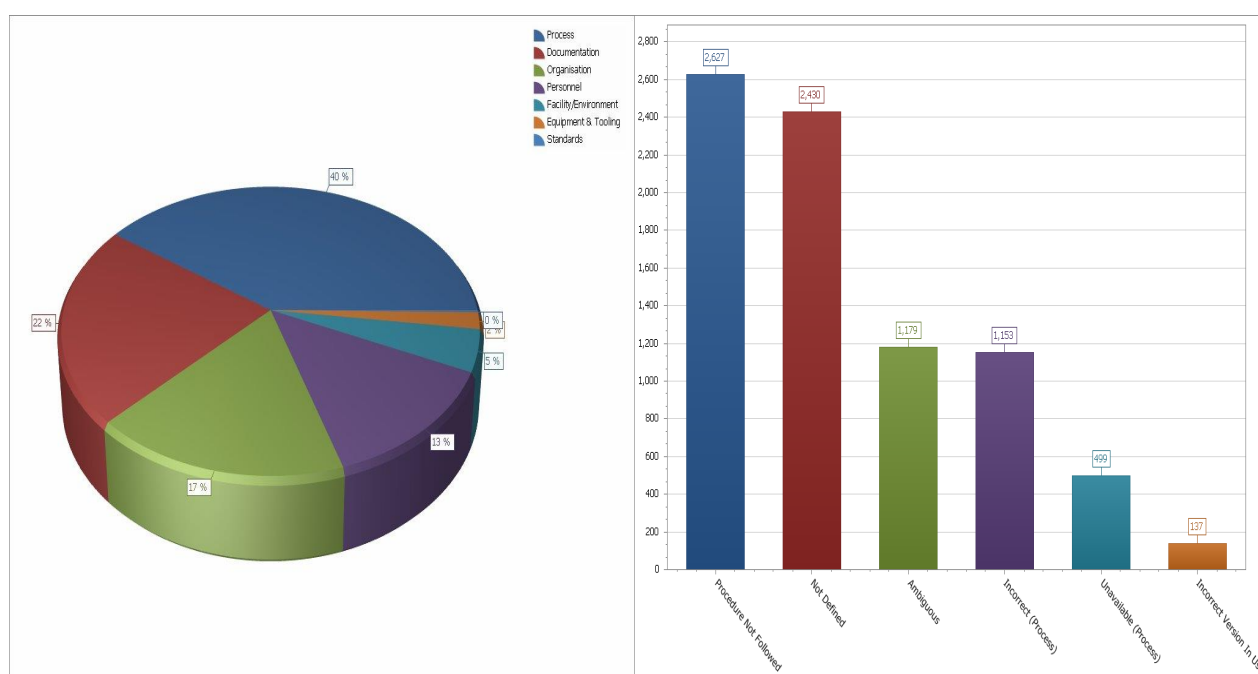
Not following procedures	4
What are procedures?	6
Who should write procedures?	7
Why write a procedure and when do you need a written one?	7
What should a procedure look like?	9
(Step by step) Instructions for writing a procedure (Aide memoire)	11

Not following procedures

Between 2012 and 2018 CAA Surveyors reported over 8,000 audit findings on Part 145 Organisations.

40% of those findings were attributed to a failure to follow procedure or process.

Why?



Sometimes, people followed the wrong procedure completely, or they didn't accurately follow the correct procedure (or the correct version) and sometimes, they didn't follow it to the prescribed standards. Sometimes, there wasn't a procedure, or it wasn't defined, or it was incomplete, or it was ambiguous. Going deeper still, reasons included:

- Processes and procedures not being written down or, if they were, being written by the wrong department, or by non-experts or non-end-users.
- Staff argued that they hadn't been trained to write procedures, or that it was somebody else's job.
- Sometimes, a perfectly good procedure would become overtaken by technology, or a re-configuration of the Organisation, or superseded by a new directive from on high.

- Old, inappropriate, out of date, inefficient and risky procedures were often defended by cries of “always done it this way.”
- Wasteful, inefficient, ineffective and, at the extreme, unsafe procedures were allowed to survive because of organisational and individual inertia.

Over the 7 years analysed, these findings were broadly steady. Why? Because closure actions tended to treat the symptoms not the root causes.

So what?

Subsequent analysis by a broad team of industry specialists recognised all these findings, symptoms, reasons and excuses in their own Part 145 Organisations. They decided to pool their resources to provide, through the CAA, a procedure to write a procedure.

This industry team included Accountable, Production, Base and Engineering Managers. They believed that they could increase their own Organisations’ productivity, delivery, safety and output quality by increasing ownership of procedures throughout their workforces because: -

- When procedures are useful, are easy to follow and appropriate to the task they tend to get followed;
- In turn, this makes Organisations more productive, effective and efficient and improves their delivery of repeatably high standards of error-free output across their functional activities;
- This would drive down operational costs; it would reduce insurance and warranty claims; it would enable and empower their people to own their issues, creating a virtuous circle of continuous improvement that would be owned by the deliverers themselves;
- Ultimately, the risk of not following procedures can damage an Organisation’s reputation. The effect of following them properly enhances it.

What are procedures?

Policies provide guidance concerning what to do; they define the boundaries of what may or may not be done. As such, policies provide for latitude in interpretation while guiding decision making. The MOE is a policy document that describes how the people in the Organisation control and use the resources that the Organisation has at its disposal, allocating who is responsible for doing what, to achieve the Outputs. The MOE may not even describe the processes within an Organisation and any procedures it does contain are likely to be at a very high level.

Processes collate many subordinate procedures to produce outputs to given standards. In an MRO, 'production' is a process that coherently and efficiently aligns many procedures to re-deliver aircraft.

Procedures are subordinate to policies and to processes. Where an organisation's output relies on many, sometimes complex, interactions within an overall process, at every functional level, individual written procedures standardise the processes we use our resources to achieve our outputs, repeatably.

Written Procedures describe how to complete a task or process. They should be brief, clear, unambiguous, discrete and repeatable. They are action-oriented, they are usually instructions and, they describe the steps to take, in the order in which those steps need to be taken and, the materiel, tools and skills to use. Well-written procedures are bounded, precise, clear, factual and to the point. They may include warnings and cautions regarding relevant hazards of not following the procedure assiduously.

Unwritten Ways of working may be perfectly valid, repeatable and safe without being needed to be written down. Unwritten Ways may be standardised but, more often, they are not. Like language, they may be personal, may have evolved, may have been copied or varied. They may permit individualism or idiosyncrasy, they may accommodate personal difficulties, taste or habits and they may only be possible to achieve for people with particular skills. Unwritten Ways may be efficient, effective and repeatable or, they may not be. If they are not, Written Procedures are required instead.

Who should write procedures?

The benefits of effective procedures are realised in each department that needs them. It follows that each responsible departmental manager and subordinate section manager and subordinate section should own, and write, or have written, the procedures that their team needs to use.

The quality manager is responsible for ensuring the procedures are compliant.

Why write a procedure and when do you need a written one?

A Written Procedure is necessary if:

- The task is important, involved, lengthy, or complex; and/or
- There will be a significant benefit from clarifying how the task is to be done; and/or
- The task is routine, but it is essential that everyone strictly follows specific rules; and/or
- The task demands consistency; and/or
- The task involves documentation; and/or
- The task involves significant change; and/or
- Errors or inconsistencies can be generated within the task, especially where those errors could have serious performance, quality, compliance safety consequences.

It is often normal for things to get done without the need for Written Procedures. Many Organisations have Unwritten Ways, standard practices and procedures and informal processes. Nevertheless, for (but not limited to) the reasons below sometimes these “ways we’ve always done it” should be set in a Written Procedure.

Unwritten ways should be turned into written procedures when:

- There are too many ways of completing the task to make the output repeatable;
- People are, or seem, confused;
- (Similar) questions about how or why things are, or should be, done are asked repeatedly;

- Near-misses indicate latent hazard(s) within processes;
- Consequential errors demonstrate that there is insufficient control of extant processes;
- Documentary records cannot prove that accepted and acceptable processes have been followed;
- The context surrounding the activity has changed (and the Unwritten Way is no longer appropriate);
- The Unwritten Ways are wasteful, inefficient, ineffective or (either directly or consequentially) can generate unsafe situations.

Making the written procedure relevant and useful:

- Ensure you decide the specific problem you want to solve or activity you want to formalise by creating a Written Procedure.
- Take 2 steps back and consider the bigger picture. What other functions and/or departments might be affected by your Written Procedure?
- Ensure you really need a Written Procedure before you write it.
- Obtain all the required inputs before you start writing (accepting you may still need to iterate your work).
- Your Written Procedure will only be effective if all the relevant resources are, or will be made, available.

Answer these questions:

- What (needs to be done)
- Why (do they need to do it)
- When (must it be done, within the wider contextual process)
- What (materiel, tools and skills are required to do it)
- Where (can it, or must it, be done)
- Who (can do it)
- How (must they do it)
- How (must they record that they have done it)

What should a procedure look like?

Written procedures should follow one of the Organisation's accepted formats (so that they are immediately recognisable and easily searchable). Whatever format is used, they should be:

- Simple;
- Clear;
- Concise;
- Written for the actual end-user (not the owner, the expert, the scribe, the Quality Manager or the Authority).

The format should be appropriate for the task, the document and the user:

- **Narrative Instructions** are easiest to write but risk:
 - Items / actions being omitted from the Written Procedure itself;
 - Elements being missed out from the pursuant activities when they are being conducted;
 - Being wordy and difficult to follow.
- **Bulleted Lists** are simple to write and to use but risk:
 - Elements being missed out during the completion of pursuant activities;
 - Weak numerical monitoring and;
 - Documentary records of completion being hard to cross refer to activities after the event.
- **Numbered Lists** are simple to write, simple to use and, (compared to bulleted or narrative lists) they provide:
 - Stronger cross-check opportunities during use and;
 - Stronger completion records.
- **Flow Charts** can provide useful visualisations for more complicated tasks where multiple options exist with decision trees but, they can be more difficult to write than simple lists.

Written procedures must communicate what readers need to know and must do:

- Readers **need** to know how to complete procedures correctly, efficiently, repeatably, compliantly, with less waste.
- Readers **need** to know what material and tools to use and what functional steps to follow and in what order.
 - o Where there are alternatives (material, tools or procedures) articulating these alternatives is useful but...
 - o Articulating the alternatives should not obscure or confuse the primary Written Procedure.
- To help readers avoid mishaps, they **should** know what could go wrong at any stage (before they conduct the next activity).

Caution - written procedures should be useful

Written procedures can become lengthy (and less useful) when they describe what readers *want* to know. Readers might *like to* know why they have to do something a certain way, where they can go for help, what methods have been tried before and have been discarded and why. This 'padding' reduces the clarity, brevity and, often, utility of the written procedure.

Therefore, written procedures should focus on the functional and technical facts and avoid wordy subjectivity.

Written procedures should include the right level of detail for the end-user.

Good questions for scribes to ask themselves are:

- How comfortable are end-users with the subject?
- Is the level of detail appropriate for the subject?
- Is the level of detail appropriate for end-users?
- Does the Written Procedure provide all the information necessary for users to complete the activity without error?
- Where the procedure includes analytical steps, is there enough information to bound users as to what, in their professional judgment, is acceptable or not to the Company?

(Step by step) Instructions for writing a procedure

1. Gather all the relevant information

Note. As the procedure writer, you need a clear understanding of what is required in as much detail as possible.

1.1 Before starting to write, gather and table detailed information on the whole process, activities and surrounding context.

1.2 Learn what information is crucial to the Written Procedure by talking with competent experts who hold key information and, if possible, liaise with other organisations who may already have similar procedures.

Note. These competent people may be long-serving staff members, experts, supervisors, stakeholders, technical staff, specialists in other organisations and, potential users of the intended Written Procedure.

1.3 If possible, 'walk through' the process yourself.

2. Draft the written procedure

2.1 Take all the gathered information and order the content so that it can be followed sequentially.

2.2 Then, cut down the information to what the end-user really needs to be able to follow the procedure.

Note. In the first draft of your Written Procedure, exact words and format are not vital but you must include the information needed by the user.

2.3 Then, work on the words, tenses, phraseology, format and organization.

Some good rules to follow are:

Write at an appropriate reading level.

List the:

- References required
- Material required.
- Tools required.

Write actions out in the order in which they happen.

- Start with the first action, and end with the last action.

Avoid too many words:

- Be specific enough to communicate clearly;
- While not padding it out, do not be so brief you lose clarity

Use the 'active, imperative' voice to write instructions as unambiguous 'orders:'

- eg. 'people a, b and c' are to 'use y' to 'do z'.

Caution. If you want to provide a warning or caution, ensure that the warning or caution is easily identified (using a standardised and easily recognisable format) and that it immediately precedes the relevant activity.

Arrange instructions as bulleted lists or, (where the sequence – matters: will improve output or the documentary record or will reduce the risk of errors) or as **numbered lists**.

Where decisions are required, or the detailed procedure may follow different branches and sequels depending on the findings of preceding instructions, consider using flow charts to clarify the procedure to the end-user to reduce the risk of mistakes when the procedure is being followed.

Note. If you need to explain your reasoning or assumptions, ensure they are valid and use a standard, easily recognisable format so readers know that the text is an explanation and not an instruction.

Emergency recovery steps

If there is a chance that something can go wrong, and users might need to implement Emergency Recovery or Mitigation steps then these emergency instructions must be particularly clear so that they can be successfully and correctly followed even when the user is under considerable pressure.

(Step by step) Instructions for writing a procedure

3. Arrange the text and any diagrams in an appropriate design format

3.1 Use appropriate formats to make instructions easier to follow and, thereby, more useful and effective.

The content is essential, but the design and format of the Written Procedure can add significant value to it.

3.1.1 The format used for Written Procedures should be appropriate to the size and complexity of the facility, the process and the relevant task. The training, skills, attitude, knowledge and experience of the end-user should be considered when deciding the format and design.

3.1.2 A design format that is consistent with other Written Procedures in the relevant users' existing manuals makes it easier for the user to recognise the important elements of the Written Procedure and, thereby, increases its effectiveness and efficiency. It follows that, unless applying wholesale change to a document set, if users are accustomed to a particular format, the Writer should use that format if it is appropriate.

3.2 Baseline format requirements include:

1. **Reason** for having / using the Written Procedure
2. **Scope** (what it considers and covers and who it addresses)
3. **Responsibility(ies)** (for the Written Procedure and who can conduct it)
4. **Reference Documents**
5. **Definitions**
6. **Material List**
7. **Tooling List**
8. **Step by Step Instructions**
9. **Documentary Records** (of the activity and the specific actions taken)

4. Check that your written procedure actually works. Perform a '3-step Quality Check' as follows:

4.1 Take the questions you tried to answer in the beginning (which were):

- WHAT (needs to be done)
- WHY (do they need to do it)
- WHEN (must it be done, within the wider contextual process)
- WHAT (material, tools and skills are required to do it)
- WHERE (can it, or must it, be done)
- WHO (can do it)
- HOW (must they do it)
- HOW (must they record that they have done it)

And **ensure your Written Procedure answers these questions clearly and unambiguously.**

4.2 Test your written procedure on at least 2 end-users, in a controlled way, in the live environment:

- 4.2.1 Task relevant end-users to use the Written Procedure to conduct the task;
- 4.2.2 Note any unexpected errors or omissions;
- 4.2.3 Record *and listen to* their feedback on the utility of the Written Procedure;

4.3 Improve the written procedure in response to the feedback and any lessons identified:

- 4.3.1 Revise and refine the Written Procedure;
- 4.3.2 Repeat the test (using new end-users as well as the original ones if possible) and
- 4.3.3 Refine the Written Procedure again if necessary.

5. Promulgate it

Once proven to be useful, your new Written Procedure must be incorporated in the Organisation's procedures repository. This may be a manual, an electronic database or a stand-alone document set. However, people won't use procedures that they don't know are there so, your new Written Procedure must be 'marketed' to its intended end-users and, formally, be rolled out. So...

5.1 Produce it.

5.2 Explain why it is needed.

5.3 Promulgate it and incorporate it in the relevant place.

5.4 Train users to use it, where appropriate by formal demonstration, highlighting pitfalls to avoid.

5.5 Identify, take and record opportunities for users to practise using it.