



INFORMATION SHEET

Human factors: Usable procedures

Introduction

Procedures are agreed safe ways of completing tasks and are an essential part of any safety management system. Usable procedures increase human reliability by providing a consistent and safe means of performing a task. They can also be job aids to assist with reducing skill-based error from slips and memory lapses. Usable procedures help to ensure safe and reliable operations by providing workers with the necessary information to complete a task.

Scope and objectives

This document provides guidance to assist operators in developing accurate and usable procedures. This document provides operators with:

- a decision aid for determining whether a written procedure is needed
- advice on content and layout of procedures to ensure they are usable
- a high-level checklist to be used to ensure that current procedures and new procedures are developed in a way to optimise useability.

Definitions and abbreviations

HTA – Hierarchical task analysis involves identifying a goal, and breaking down the goal into a hierarchical order of meaningful tasks and subtasks required to complete the overall goal.

WAD – Work as done – describes the reality of how work is done.

WAI – Work as imagined – describes an idealistic view of how a task should be performed.

Why procedures are not used or followed

People may not comply with procedures for a variety of reasons. Some of the more common reasons include:

- procedures are out-of-date or inaccurate
- procedures are not readily available
- procedures are difficult to use or unworkable in practice
- there are easier or safer ways of performing the task
- it is accepted practice to deviate from procedures
- people are unaware that a procedure exists
- perceived pressure from peers and/or management to 'get the job done'
- it is assumed people already know what is in the procedure and can rely on their own skills and experience.

Deciding on a procedure or job aid

Determining whether a procedure is required or a simplified job aid is suitable depends on the type of task being carried out. Several factors must be considered, including whether the task is safety critical, the complexity of the task, how often the task is performed and the experience of the worker performing the task. Figure 1 presents a flowchart that may help determine when a procedure versus job aid should be used.¹

If a job aid is deemed suitable for the task, there are several common types such as checklists, diagrams and flowcharts.

The use of job aids can reduce the likelihood of human error. For example, job aids can reduce the likelihood of a step being forgotten or unintentionally skipped. The use of 'hold points' in a job aid can assist workers to transition from unconsciously performing tasks to consciously performing tasks. Job aids also reduce the demand placed on working memory and cognitive capacity to help successfully perform tasks in stressful situations, such as emergency response or abnormal operating conditions.

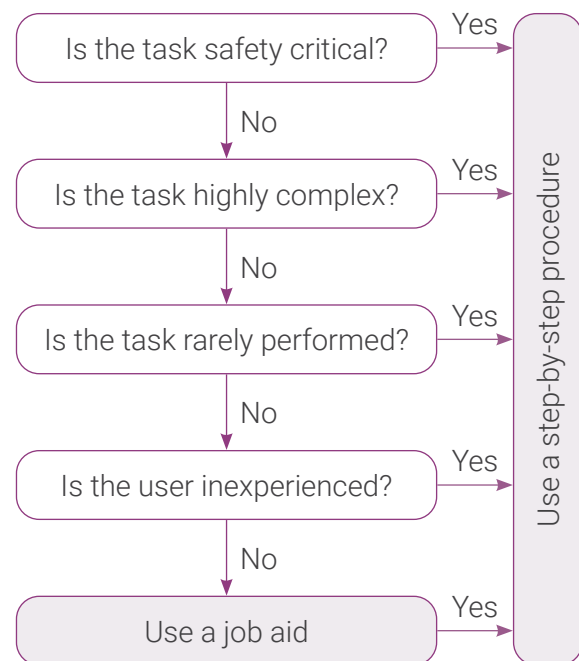


Figure 1 Guide to determine whether to use a procedure or a job aid

¹ Health and Safety Executive, [Revitalising procedures](#).

Characteristics of usable procedures

The following sections identify key characteristics necessary to ensure procedures are readily accessible and used by workers.

Completeness and accuracy of content

Procedural content needs to accurately reflect how the task is done and must provide users with enough information to perform the task safely and correctly. The content in the procedure should be consistent with all other operating documents related to the task. Table 1 lists the recommended components to be included in a procedure.²

Table 1 Recommended components of a procedure

Component	Description
Title and date	Document title, date created and date revised (if revised).
Table and contents	Outline of what is included in the document. This may aid navigation in long procedures.
Purpose/scope	Outline the goal of the procedure and to whom and what it applies.
Discussion	Briefly describe components, systems and tasks.
Definitions	Describe all critical terms used and any abbreviations.
Roles/responsibilities	Include the number of workers necessary and the required training and qualification for each worker.
PPE	Describe all personal protective equipment (PPE) requirements and any safety critical information associated with this PPE.
Materials/equipment	Describe all required material and equipment and the safety critical information associated with it.
Precautions	Detail the safety information related to workers, equipment and environment.
Prerequisites	Include any task or conditions that must be met prior to initiating procedure.
Limitations	Describe any restrictions on plant status, system or equipment operation, and important operational parameters.
Procedural steps	All steps taken to complete the task and any illustrations and photographs to aid in clarification of actions.
Acceptance criteria	The set of predefined requirements that must be met in order to mark the task step(s) complete.
Final conditions	Describe how the facility, equipment, etc. should be left following completion of the task.
References	List of all the sources used in the procedure so readers can easily find what has been cited or referenced.
Appendices	Include any consequences of deviation tables, flowcharts, and graphs.
Related documents	Include links or where to find job aids and all other versions of the procedure.

2 Human Performance Oil & Gas, [Best Practice in Procedure Formatting](#).

Level of detail and conciseness

Procedures should only include 'need-to-know' information. Procedures that are too detailed may become hard to follow, resulting in them being used less frequently. Alternatively, if there is insufficient information it may prevent an inexperienced worker from safely carrying out the task.

The level of detail should be determined based on the safety critical nature of the task (assessed risk), the worker characteristics and the task complexity. Table 2 details the consideration that should be given to each of these factors.

Table 2 Considerations for determining level of detail

Consideration	Explanation
Safety critical nature of task (e.g. consequences of errors)	The level of detail should increase as the risk of injury, equipment/facility damage or environmental harm increases.
Worker characteristics (e.g. knowledge, skills, experience, literacy levels, and physical abilities of the person assigned to perform the task)	Procedures should provide enough detail so all involved workers, including newly qualified workers, transferred workers and workers where English is a second language, can independently: <ul style="list-style-type: none"> • understand the potential hazards associated with the process or equipment involved with the procedures. • verify defined controls are in place. • confirm the process or equipment is responding as expected. • carry out infrequent or unusual tasks.
Task complexity (includes variability)	The level of detail in a procedure depends in part on the complexity of the work, difficulty in performing it, and task variability. The following task types should be considered: <ul style="list-style-type: none"> • Complex tasks – these task types may need greater detail to help workers avoid omitting steps; however, if the task is complex due to variability, less detail may be appropriate to allow flexibility. • Routine tasks – these require less detailed procedures, particularly those with highly reliable feedback mechanisms. • Unusual tasks – a procedure involving an action with an unusual feature should specify the unique steps necessary to operate that feature correctly. • Infrequent tasks – procedures that are infrequently used may require more detail than a routine task. Emergency procedures requiring immediate action may require a unique format that facilitates rapid response.

End-user consultation

Adequate knowledge of a task is required to develop a new procedure or review an existing one. It is essential to involve workers who actually perform the task in the development or review process. Three methods are commonly used to ensure a sufficient level of knowledge and involvement from workers; these methods are listed here.

Walk-through talk-through

This method is used to get a basic understanding of how workers actually perform the task. It involves observing a worker demonstrating how the task is performed. It is a tool that can help identify where errors or mistakes may be made, the performance-shaping factors that may increase the likelihood of the errors or mistakes, and how the operator might recover from the situation. It may also be used to ensure that “work as done” (WAD) matches “work as imagined” (WAI), which can be used to check if old procedures are still relevant.

Task analysis

Task analysis is used to develop further understanding of the task by describing, in increasing detail, each of the steps recorded in the walk-through talk-through. This includes describing each task step, associated actions and judgements and decisions needed to perform the task. The most effective method of task analysis for procedures is hierarchical task analysis (HTA).

Stakeholder consultation

The team creating procedures should consult with the appropriate people who have the required knowledge and experience to develop accurate and usable procedures. This may include operators, maintenance personnel, engineers, process safety engineers, health, safety and environment staff, and subject matter experts (SMEs).

Consultation with relevant workers can provide a realistic and accurate view of the job and encourage ownership and acceptance over the new or revised procedure. Informal working practices and alternative methods of performing the task can also be documented in this way.

Consistent and comprehensible presentation

For a procedure to be accessible and usable, it should be formatted in a standardised manner. The below points provide guidance on document formatting and word choice for procedure writing.

- Write procedures in the present tense.
- Use the active voice (i.e. begin each instruction or step with a verb).
- Only one action should be included per procedural step.
- Use short and simple sentences with appropriate punctuation and vocabulary.
- Specify who is responsible for tasks and when those tasks are to be done (including any sequence of tasks, as required).
- Provide quantitative values and limits where possible.
- Ensure that quantities and dimensions correspond to those on controls and displays.
- All steps should be numbered and written in the order in which they are to be performed.
- Referencing of other procedures should be limited and only included if necessary.
- Use recognised safety symbols and statements and ensure all warnings are highlighted (e.g. bold, italics or in a box).
- Tables and figures (e.g. pictures and pictograms) should be formatted in a way that aids in understanding the procedure content.

Administrative control

Before any new or revised procedure is rolled out to the workforce it should be subjected to a thorough review and approvals processes.

Procedure review

A full technical and usability review should be conducted on a procedure prior to its release. This should be done by a working group that includes key stakeholders (i.e. workers who will use the procedure and those with the technical expertise to determine if it is suitable) and individuals who have knowledge and experience in creating usable procedures. It is important to check the procedural steps to ensure that they represent the safest and most practical ways of performing the task. If they do not, the procedure should be updated.

Procedure implementation

Arrange appropriate training and communications once the review has been completed and the procedure has been signed off. Include all users to ensure they engage with the new or changed procedure.

Continual review

Periodically review the implemented procedure and evaluate whether it continues to be accurate and appropriate. If it is deemed to be out-of-date, the processes for changing it should be repeated.

Usable procedures checklist

The following checklist has been designed to help operators ensure that their procedures are usable and accurate. If an operator answers 'NO' to any of the following questions, it may suggest that the procedure needs to be revised.

Format (layout, text and language)		
1.	Formatting is consistent between procedures.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Formatting is easy to read and minimises unnecessary information.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.	Procedure formatted for easy information retrieval (e.g. appropriate font size, use of colour, bold and italicised words).	<input type="checkbox"/> Yes <input type="checkbox"/> No
4.	Vocabulary used is conventional, simple and easily understood (e.g. avoids acronyms and abbreviations, double negatives and unnecessary words such as 'a' and 'the').	<input type="checkbox"/> Yes <input type="checkbox"/> No
5.	Tables, figures and pictures are legible and consistent with the procedure steps and accurately represent what is expected in the task.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Actions		
1.	Steps are numbered in a consistent and easily identifiable manner.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Steps only have one associated action.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.	Steps clearly identify who does what and when.	<input type="checkbox"/> Yes <input type="checkbox"/> No

Technical information		
1.	Procedure provides specific values and limits for safety critical controls.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Procedure refers to the specific items of the plant and equipment (e.g. it includes the specific labels and equipment numbers that are used in the real world).	<input type="checkbox"/> Yes <input type="checkbox"/> No
3.	Procedure clearly provide pass/fail criteria for inspection and testing activities.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other		
1.	Procedure references all relevant documents (e.g. associated job-aids).	<input type="checkbox"/> Yes <input type="checkbox"/> No
2.	Does the procedure include all necessary sections of a good procedure, including:	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Introduction and purpose	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Precautions to be followed	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Special tools and equipment required	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Initial conditions to be met before commencing task	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Procedural steps to perform task safely and efficiently	<input type="checkbox"/> Yes <input type="checkbox"/> No
	End of procedure statement	<input type="checkbox"/> Yes <input type="checkbox"/> No

Additional information and resources

- WorkSafe, [Human factors fundamentals for petroleum and major hazard facility operators: Guide](#)
- WorkSafe, [Human factors self-assessment guide and tool for safety management systems at petroleum and major hazard facility operations](#)
- WorkSafe, [Human Factors self-assessment tool for safety management systems: Template](#)
- Health and Safety Executive UK, [Information sheet: Revitalising Procedures](#)
- Human Performance Oil and Gas, [Best Practice in Procedure Formatting](#)