

Annex 2:

Best Practice Guidance on Procedures for Small and Medium Sized Enterprises

for

PRISM

DET NORSKE VERITAS

*Det Norske Veritas Limited
Technical Consultancy Services*

Highbank House
Exchange Street
Stockport SK3 0ET
United Kingdom

Tel :+ 44 (0) 161 477 3818
Fax :+ 44 (0) 161 477 3819
E-mail: stockport @dnv.com

Registered in England
No.: 1503799

Best Practice Guidance on Procedures for Small and Medium Sized Enterprises

for

PRISM

*Approved by:.....
Gareth Hughes
Human Factors Business Leader*

Job No.306002
Revision 0
September 2002

Issue Log

Revision	Issue Date	Prepared by	Reviewed by	Approved by	Comments
Rev 0		Helen Jones	Rob Cotterill	Gareth Hughes	For comment

GLOSSARY

DNV	Det Norske Veritas
HTA	Hierarchical Task Analysis
PRISM	Process Industries Safety Management
SME	Small & Medium Sized Enterprises

Contents

1. INTRODUCTION	1.1
1.1 Background	1.1
1.2 Objectives	1.1
2. DEVELOPMENT OF PROCEDURES	2.1
2.1 Collect information about the task and the users	2.1
2.2 Involve the workforce	2.1
2.3 Determine the format of the procedures	2.1
2.4 Design of the procedures	2.3
2.5 Screening by other members of the workforce	2.6
2.6 Training the workforce on the procedures	2.6
2.7 Provide feedback on the effectiveness of the procedures	2.6
2.8 Monitor effectiveness of training	2.6
2.9 Outline a control system for the update and review of procedures	2.7
2.10 Outline a schedule for refresher training	2.7
3. RESOURCE REQUIREMENTS AND TYPICAL TIME-SCALES	3.1
3.1 Data Requirements	3.1
3.2 Expertise Requirements	3.1
3.3 Techniques	3.1
3.4 Timescale	3.1
4. BENEFITS AND POTENTIAL PROBLEMS	4.1
5. REFERENCES	5.1

1. INTRODUCTION

1.1 Background

A **procedure** can be defined as “*an established method*” (Collins Dictionary) or a “*list of instructions which the user / operator must follow in order to carry out a task*” (SRD, Association, 1991).

From a safety system perspective, procedures are established methods that have been written down.

Procedures, especially operating and maintenance procedures, are important for the prevention of accidents and ill health. Written procedures are vital in maintaining consistency and in ensuring that the whole workforce has the same basic level of information about the task. Procedures act as a key element in the safety management system and are an important training tool.

However, procedures must be well written, usable, available and up-to-date as well as being technically accurate or they will not be followed by the workforce.

According to the UK Health & Safety Executive (HSG48, 1999), procedures ideally need to:

- be accurate and complete;
- be clear and concise with an appropriate level of detail;
- be current and up-to-date;
- be supported by training;
- identify hazards;
- state necessary precautions for hazards;
- use familiar language;
- use consistent terminology;
- reflect how tasks are actually carried out;
- promote ownership by users;
- be in a suitable format; and
- be accessible.

1.2 Objectives

This guide sets out to present best practice in the development of procedures for small and medium sized industries. The aim is to present the issues that are of concern in creating procedures, and to give advice on specific issues surrounding their design. A table of specific advice is given in Section 2 and resource and time requirements are given in Section 3.

2. DEVELOPMENT OF PROCEDURES

The steps below outline the method for developing good procedures. Existing procedures can be evaluated by comparing the current format with the advised format outlined in these steps.

2.1 Collect information about the task and the users

Initially, it is necessary to establish the scope and purpose of the procedure. Detailed information about the task must be collected (e.g. by using a Hierarchical Task Analysis (HTA)). Hazards associated with performing the task should be identified or reviewed. Secondly, the potential procedure users must be identified. These may come from different work areas, e.g. users / operators, trainers, trainees, maintenance staff.

2.2 Involve the workforce

All procedures, especially operating instructions, must be technically correct in order to be effective. This aspect of a procedure is usually addressed fairly satisfactorily, as they are often written by technical staff or trainers. It is also important to determine if they are operable and practical. Input from the operating staff will ensure that the procedures are written to accommodate all elements of the job and thus avoid conflict between the procedure for that task and other aspects of work. Failure to invite users to be involved in writing the procedures often results in them being unable to work by them. Ideally, a representative from every work team / shift should be consulted, as often each group may have their own ways of working and attitudes towards procedures.

If the workforce are allowed to input into the design and writing of a procedure, they are more likely to take ownership of that procedure and comply with it. They are also able to give practical insight on how the task may be performed in reality, i.e. in conjunction with other tasks, with breaks in the work during the procedure, as well as how many people would usually be involved.

2.3 Determine the format of the procedures

There may be an established procedure format within the organisation. It is important that the style is consistent throughout. The format may have been designed to provide clear evidence to inspectorial authorities that safe, good practices are in operation. This may reduce the effectiveness of the document by over-loading the procedure with unnecessary information. Compromises must be made, therefore, and applied consistently throughout the organisation's procedures.

For any procedure format to be successful, it must be accessible at the time and place it is required, readable (taking into account text size and lighting conditions) and durable, i.e. if a checklist is likely to be used frequently it must be laminated in a matt coating or protected somehow. Therefore the intended function of a procedure will determine its format. Embrey (2001) provides a matrix for choosing the level of job aid required for a task.

Figure 2-1 provides similar guidance on which format to use.

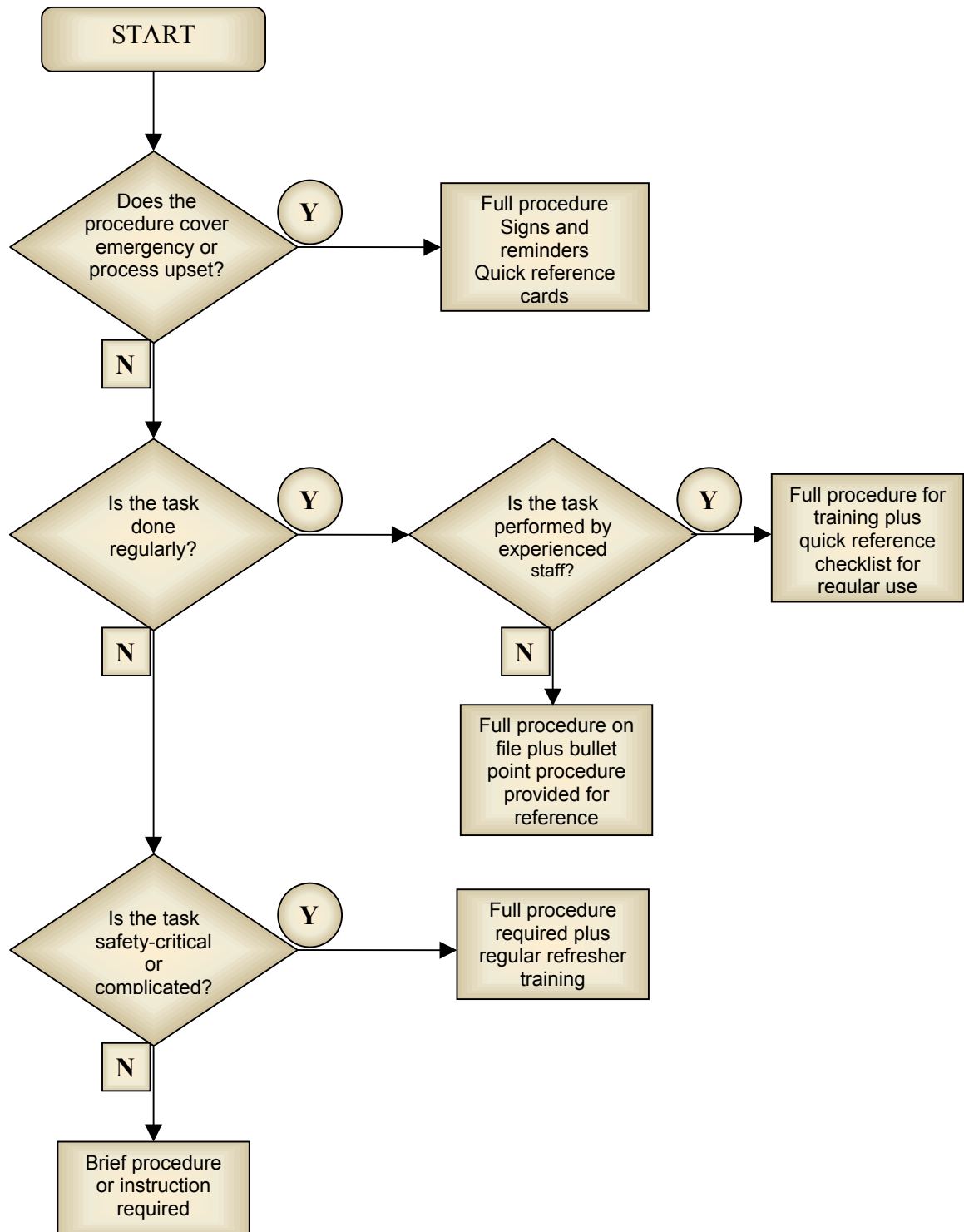


Figure 2-1: Flowchart to show guidance on selection of procedure format

Everyday frequently used methods, e.g. for checking level indicators, will not require a full procedure that must be referred to on each occasion. Such tasks become second nature to the workforce and so are best enforced through effective training and job aids along with reference material for new starters. Other jobs that are more complicated, yet still conducted frequently will be best supported by a bullet-point checklist procedure that may be carried by the workforce with a more detailed document filed for reference. Infrequent tasks, whether they are simple or complicated should be documented in full. For this type of task, training is not effective, as it is often not put into practice for long periods and details are forgotten.

2.4 Design of the procedures

An example of a general procedure format, with all the sub-sections listed, is shown in Figure 2. It demonstrates a clear hierarchical indexing system that allows the required information about the task to be accessed quickly and easily.

Figure 2: Example procedure format

<u>General Procedure</u>
1. Introduction
1.1. Purpose
1.2. Scope
1.3. Applicability
2. Precautions and Warnings
2.1. Warnings
2.2. Cautions
2.3. Limitations
3. Prerequisite Actions
3.1. Training Requirements
3.2. Personal Protective Equipment
3.3. Special Tools and Equipment
3.4. Related Documentation
4. Procedure
4.1. Procedure Matrix (lines, valves, pumps, etc)
4.2. (Task Stage)
A) (Task Step)
CAUTIONS
WARNINGS
5. Emergency Procedures
6. Post-Performance Activities
7. Appendix

How the detailed information is arranged underneath these main headings may depend on a format that has been predetermined by the organisation. However, some general advice on the design of procedures is outlined in table 1.

Table 1: General Advice on Procedure Design

Issue	Advice
Length of procedure	Procedures should be kept as concise as possible whilst still conveying all the necessary information.
Level of detail included in the procedure	The level of detail required is determined by the level of training given on the job, the baseline qualifications required to do that job and the information that is required to be included by the inspecting authority.
Presentation of instructions	Instructions should be active, positive and explicit. They should tell the reader what to do, rather than what not to do. They should specify actions, e.g. "Start the pump" rather than describe the step e.g. "the pump should be started".
Order of the instructions given	Instructions should be written down in the order in which they should be performed. Instructions that state "Do B after doing A" should be rewritten as "Do A, then do B".
Equipment & tools required	These should be stated at the beginning of the procedure.
Use of language	The words used in the procedure must match terms employed by users. Generally accepted & defined expressions should be adopted if appropriate. However, ensure that there is consistency throughout the workforce to avoid confusion between teams.
Condensed sentences	Do not omit words such as "a" and "the" as this can introduce ambiguity to an instruction, e.g. "Remove safety cover protecting switch" could be interpreted as "Remove the safety cover whilst protecting the switch" or "Remove the safety cover that is protecting the switch".
Use of negative language	Where possible negatives should be avoided. It is best to state what should be done, rather than what should not be done. Where negatives cannot be avoided, state simple sentences using "no", "not" and "never" as these are easier to understand. Negatives can be used effectively for warnings or emphasis.
Ambiguous conditions	"Do not start the extractor fan when the vessel is under pressure". It is unclear what is meant by "under pressure". It could mean pressurised or it could mean pressurised beyond its normal operating pressure. Specific measurements or ranges should be stated instead where possible.
Font and typeface	Avoid using very small fonts (i.e. below 10) as these are difficult to read. DO NOT USE ALL CAPITAL LETTERS IN THE TEXT, AS THESE ARE SLOWER AND MORE DIFFICULT TO READ. They can be put to good effect for particular words warnings or points to note. Instead, use italics, underlining or bold to highlight items.
Spacing and paragraphs	It is important to space out the steps of the procedure. Although it may increase the number of pages, the user will find the required information easier to locate quickly.
Numbering	All procedures should be given a reference number. Sections within the procedure and pages should also be numbered consistently.
Index and contents page	If the procedure is part of a set, or is particularly long it is useful to include an index and a contents page to assist the quick access of desired information within the procedure.
Diagrams and flowcharts	Diagrams will often be much more effective at communicating information quickly than via a block of text. For this reason, graphs, charts, line diagrams should be utilised to their best effect. Flowcharts are especially useful for sequential operations.
Photographs	These are particularly useful when they are of a good quality and are clearly labelled.
Tables	Tables should be used for reference figures like calibration data or decision matrices.
Process flow diagrams (if applicable)	These can provide a good contextual grounding for the procedure as well as providing a detailed representation of the specific task equipment.
Glossary	Technical terms or any term that may be ambiguous must be explained and clarified. This should be done in a glossary rather than the procedure itself as experienced users will not require this information and the procedure will become cluttered. <i>Italics</i> or bold should be used to indicate that the term is explained in the glossary.

2.5 Screening by other members of the workforce

- Ensure that the procedure can be easily understood and applied by its intended users.
- Check for “bad rules”, i.e. ones which are too restrictive and may prove impractical or impossible to apply under certain circumstances.
- Check that one rule does not contradict another.
- Remove any rules that are so general or vague that they offer no genuine help.
- Remove unnecessary rules as these will increase the length of the procedure, reduce the efficiency of the procedure and discourage its use.

2.6 Training the workforce on the procedures

It is not sufficient to assume that people will read the procedures or to ask them to sign to say they have read them. Some workers may not be confident in their reading ability, or may not fully understand or remember the procedure when they read it. Often, workers are not given sufficient time within working hours to study the procedures. Each individual must be trained on the procedure to ensure that they are given the opportunity to ask any questions and feel comfortable that they will be able to follow the procedure in full.

Training may be given formally at a designated training session, or informally during team meetings or on-the-job.

2.7 Provide feedback on the effectiveness of the procedures.

Not all the potential problems with a procedure may be detected until it is operational. Changes to the workplace, manning levels, tools and equipment, etc can render a procedure impractical. Hence, not only process changes can spark the need for procedural change. Often such problems remain undetected by those who have the authority to change the procedure, as there is no formal feedback system in place. As a result, the workforce is forced to contravene with the procedures in order to complete the task yet are likely to be blamed for doing so should anything go wrong.

Feedback can take the form of verbal suggestions, or a comments form that is kept with the procedure as a working document or can be a more formal amendment document that is submitted to those responsible for changing the procedure.

Irrespective of the feedback channel, it is vital that the recommendations and comments are recognised and actioned. If they are rejected, the reasons behind this decision should be justified and communicated to the workforce.

2.8 Monitor effectiveness of training

Once the workforce has been trained on the procedure, often it is assumed that they are following it and that the competency requirements have been addressed. However, individuals may forget aspects of the training or chose not to follow the procedure.

Monitoring should take place to ensure that the procedure is followed and if not, identify any underlying causes for this, e.g. lack of understanding.

2.9 Outline a control system for the update and review of procedures

Each organisation should actively ensure that all procedures are kept up-to-date, complete and technically accurate. They should be reviewed on a regular basis and up-dated where necessary. Procedures should also be up-dated following any operational changes that may affect that task and when any problems are highlighted through the feedback system. It is also vital to check that procedures are available where they are required and that they have not been removed or become damaged.

2.10 Outline a schedule for refresher training.

Similarly, refresher training should be given regularly to all members of the workforce associated with that task. One individual in a team may use the procedure daily, whereas another may not use it at all. Infrequent tasks, safety critical tasks and emergency procedures must be targeted, with practice drills for emergency response. To ensure that competences are maintained, training should also be given when any changes are made or when an individual has been identified as requiring a refresher session (either due to changes in their job, incidents, or personal request).

3. RESOURCE REQUIREMENTS AND TYPICAL TIME-SCALES

3.1 Data Requirements

- Current procedures (if they exist) for the task;
- Company standards for procedures and their format.

3.2 Expertise Requirements

- Workforce participation - vital to ensure usability and ownership;
- Management support - to ensure effective monitoring and promote safety from all levels within the organisation;
- Technical input from e.g. process engineers, maintenance engineers - to ensure accuracy of procedures;
- Training resources - to ensure all changes to procedures and work practices are effectively communicated to all members of the workforce.

3.3 Techniques

Techniques that can be effectively used to assist in the creation of procedures are hierarchical task analysis and activity analysis.

3.4 Timescale

The process of writing, reviewing and updating procedures should not be given a fixed time-scale. It should be an ongoing process that is monitored and proactively encouraged by all members of the workforce.

4. BENEFITS AND POTENTIAL PROBLEMS

Organisations often invest large amounts of time and money formulating and maintaining procedures. They are not only required to demonstrate safe practices and ensure the workforce has the knowledge to perform a task, but also to control activities within the organisation. If the procedures are not effective, then the organisation will not be aware of the activities within their business and thus cannot ensure safety or efficiency.

Unfortunately, there is often a suspicion amongst the workforce that many procedures only exist to avoid the organisation being liable should an incident of accident occur, rather to assist workers to perform their job safely and efficiently. Often, they have previous negative experience of promises of feedback channels or inclusion in the design process that were never implemented or were ineffective. It is necessary to ensure that all proposed workforce participation takes place and that the consequence of any input or suggestions is communicated back to them.

5. REFERENCES

Embrey, D (2001) Why Don't Real Men Use Procedures? A systematic approach to enhancing compliance to procedures in safety critical systems. *Industrial Safety Management*, Volume 3, Edition 3, September 2001.

HSE (1999) *Reducing Error and Influencing Behaviour*, **HSG48**. HSE Books.

HFRG (1995) *Improving Compliance with Safety Procedures: Reducing industrial violations*. HSE Books.

Shepherd, A. (1991) *Developing Best Operating Procedures: A Guide to Designing Good Manuals and Job-aids* **SRDA-R1**, SRD Association, Culcheth, WA3 4NE, UK.