

DEP SPECIFICATION

HUMAN FACTORS ENGINEERING – LABELLING OF FACILITIES, EQUIPMENT AND PIPING

DEP 30.00.60.21-Gen.

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DESIGN AND ENGINEERING PRACTICE



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All administrative queries should be directed to the DEP Administrator in Shell GSI.

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1. INTRODUCTION

1.1 SCOPE

This DEP specifies Human Factors Engineering (HFE) requirements for the content, design, layout and positioning requirements for signs, labels and markings to be applied or the following:

- a. equipment, component and cable identification;
- b. panel and console labels;
- c. pipe markers;
- d. hazard identification signs;
- e. information signs;
- f. safe working load identification labels;
- g. visual aids for improving equipment effectiveness.

This DEP ensures that signs, labels and markings are designed, sized and located in a way that:

- a. facilitates visibility and legibility;
- b. clearly indicates the presence of hazards and dangers;
- c. supports users (installers, operators, maintainers) in identifying equipment and the safe and efficient execution of tasks;
- d. minimizes the risk of errors caused by equipment misidentification.

The requirements in this DEP do not cover all the applicable requirements for the following:

- a. development of Equipment Tag Numbers (See DEP 01.00.09.10-Gen.)
- b. safety symbols, life-saving, fire protection, and regulatory required signage, other than those identified above;
- b. product safety labels.

This is a revision of the DEP of the same number dated February 2012; see (1.5) regarding the changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorized access to DEPs does not for that reason constitute an authorization to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities related to oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases, the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

The word **may** indicates a permitted option.

1.3.2 Specific definitions

Term	Definition
Caution Label	Indicates a potentially hazardous situation, which, if not avoided, may result in minor injury to a person, minor damage to the equipment, or a minor pollution problem. A caution label should not be used when there is a possibility of death or serious injury.
Danger Label	Indicates a hazardous situation, which, if not avoided, could result in death or serious injury to a person, serious damage to vital equipment, or a major environmental pollution problem.
Hazard Label	A type of label used to identify and provide information about situations that may be hazardous to personnel, equipment or the environment. The types of labels to be used are "DANGER" and "CAUTION".
Identification Label	A type of label used to identify piping contents, vessel contents, and individual equipment, (e.g., valves, gauges, junction boxes, filters, pumps, transmitters, controls), or places (e.g., rooms, buildings).
Information Label	A type of label used to present non-procedural information of a general nature.
Independent Symbols	Symbols that alone provide information to the user without requiring elaboration by supporting text (e.g., earmuffs to indicate a high noise area requiring hearing protection).
Instruction Label	A type of label used to present instructions for accomplishing a specific task or tasks, along with any hazard or safety information related to performing the task(s).
Label	Any plate, sign, placard, inscription, legend, symbol, marking or combination thereof, which is used to impart visual information, warnings or instructions to a reader.
Label Catalogue	A list of all labels placed in a facility, such that persons at the facility could use the list to purchase, or have made, the same label if the original labels required replacement or additional labels of a particular type were needed at the facility.

Term	Definition
Marking	Painted (e.g., stencilled) information that conveys visual information, warnings or instructions to a reader.
Notice	Signs used to indicate a statement of company policy directly or indirectly related to the safety of personnel or protection of property. This signal word should not be associated directly with a hazard or hazardous situation and shall not be used in place of "DANGER" or "CAUTION."
Panel and Console Labels	Labels that appear on operator consoles and panels to identify individual or groups of controls or displays.
Sign	See "Label".
Tag	Physical plate, sign or placard that is attached to an item by lanyard, chain or similar, and contains visual information for the reader.
Tag Number	Unique alphanumeric identifier used to identify assets or an equipment item (valve, instrument, vessel, pipeline.).

1.3.3 Abbreviations

Term	Definition
ANSI	American National Standard
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ISO	International Organization for Standardization
P&ID	Piping and Instrumentation Diagram
UV	Ultra Violet

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section or clause number is shown in brackets (). Other documents referenced by this DEP are listed in (11).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a full (minor) revision of the DEP of the same number dated February 2012. The following are the main, non-editorial changes.

Section/Clause	Change
1.1	Revised reference to other DEP's to include new Tagging Specification and have clarified what type of safety signs are included as well as what is excluded.
2.3.4	Deleted Figure 3 and Table 2 and referenced appropriate height range included in DEP 30.00.60.20-Gen., Table 10.
6.3	Revised to exclude use of pre-coiled wrap around pipe markers on uninsulated piping, unless piping is located inside enclosures that are designed to prevent against ingress of water. S
6.5	Revised to reduce the number of pipe markers and thus cost associated with installation around equipment, on horizontal piping and in pipe racks.
10	Deleted requirements for visual aids for improving equipment effectiveness.

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be submitted to the Administrator using one of the following options:

Shell DEPs Online (Users with access to Shell DEPs Online)	Enter the Shell DEPs Online system at https://www.shelldeps.com Select a DEP and then go to the details screen for that DEP. Click on the "Give feedback" link, fill in the online form and submit.
DEP Feedback System (Users with access to Shell Wide Web)	Enter comments directly in the DEP Feedback System which is accessible from the Technical Standards Portal http://swwww.shell.com/standards . Select "Submit DEP Feedback", fill in the online form and submit.
DEP Standard Form (other users)	Use DEP Standard Form 00.00.05.80-Gen. to record feedback and email the form to the Administrator at standards@shell.com .

Feedback that has been registered in the DEP Feedback System by using one of the above options will be reviewed by the DEP Custodian for potential improvements to the DEP.

1.7 DUAL UNITS

This DEP contains both the International System (SI) units, as well as the corresponding US Customary (USC) units, which are given following the SI units in brackets. When agreed by the Principal, the indicated USC values/units may be used.

1.8 NON NORMATIVE TEXT (COMMENTARY)

Text shown in italic style in this DEP indicates text that is non-normative and is provided as explanation or background information only.

Non-normative text is normally indented slightly to the right of the relevant DEP clause.

2. LABELS - GENERAL

2.1 GENERAL REQUIREMENTS

2.1.1 General

Labels, tags, legends, placards, signs, markings or a combination of these are provided to support users (installers, operators, maintainers) in the safe and efficient execution of tasks.

1. Labels shall be provided whenever personnel must identify items, or be aware of hazards.

Using this DEP will ensure that labels use language, words, symbols, abbreviations, number formats and acronyms that are familiar to the work force expected to be at the facility.

2. Labels should conform to the relevant linguistic stereotype, i.e., be read from left to right (preferred) or top to bottom (allowed), for English language.

2.1.2 Label glossary

1. The project Label Glossary shall be initiated at the start of DEFINE phase, and maintained throughout EXECUTE phase.
2. The following are characteristics of information that may be included on labels:
 - a. abbreviations;
 - b. acronyms;
 - c. number formats;
 - d. units of measurement;
 - e. symbology;
 - f. meaning of colour.
3. All labels developed for the project shall comply with the definitions contained in the project Label Glossary.

2.2 CONTENT AND DESIGN

2.2.1 Abbreviations

1. Abbreviations on labels shall be used only if the following conditions exist:
 - a. there is insufficient space to spell out the words needed for the label, or;
 - b. the abbreviation is more commonly known and understood than the spelt out word (e.g., ESD instead of Emergency Shutdown; AFFF instead of Aqueous Film Forming Foam).
2. Abbreviations shall be standardized and used consistently across all labels and defined in the project Label Glossary.

2.2.2 Units of measurement

1. Units of measurement as defined in the project Label glossary shall be used consistently across all units, equipment and Manufacturer/Suppliers.

2.2.3 Irrelevant information

1. Information not directly required by the user to accomplish the operational tasks (e.g., trade names and company logos), should be avoided on the face of the following:
 - a. consoles;
 - b. control panels;
 - c. displays.
2. Non-task oriented information should be placed on the side or back of the display or console when viewed from the expected working position.

2.2.4 Characters to avoid

1. Characters, letters and symbols which are highly confusing, should not be used in combinations or situations where incorrect reading could lead to a significant misunderstanding. For example, when labels are in English:
 - a. the number "1" should not be used in combination with the letters "L" or "I";
 - b. the number "0" should not be used in combination with the letters "O" or "Q".

2.2.5 Character and numerals

1. Characters shall be simple block type format, using a font such as Arial or Helvetica.
2. Numerals shall be Arabic (as opposed to Roman).

2.2.6 Character and background colour

1. Labels for the following shall be provided with black characters on a white background:
 - a. vessel;
 - b. equipment;
 - c. component;
 - d. instrument device;
 - e. cable identification.

Equipment and components include, but are not limited to the following:

- *equipment (e.g., vessels, pumps, filters, electrical and communications.);*
- *instrument devices (e.g., gauges, transmitters.);*
- *valves (actuated control valves).*

2.2.7 Surface colour contrast

1. Label background for items not covered by (2.2.6) shall provide maximum contrast with the colour of the surface to which the label will be attached.
2. Safety colour specification should follow ANSI Z535.1 or ISO 3864-4 as appropriate.

2.2.8 Character heights

1. The height of letters and numerals shall be determined by the expected reading distance as specified in table 1 and based on a minimum illumination level of 10 Lux (1 Foot-candle).

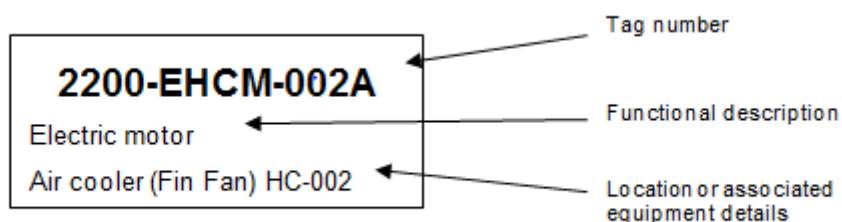
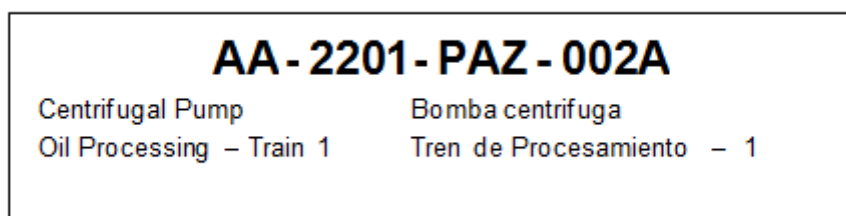
Minimum character heights apply to the lower case characters without ascenders and descenders (e.g., a, m and c).

Table 1 Minimum character heights (for lower case characters) by viewing distances

Viewing Distance in metre (ft)	Full Tag Number (First Line) Character Height in mm (in)	Functional Description (Second / Third Lines) Character Height in mm (in)
< 1 m (3 ft)	7 mm (0.3 in)	5 mm (0.2 in)
1 m to 3 m (3 ft to 10 ft)	21 mm (0.8 in)	14 mm (0.6 in)
> 3 m (10 ft)	42 mm (1.7 in)	28 mm (1.1 in)
(Source: Adapted from ISO 11064-4)		

2.2.9 Justification/alignment

1. Tag Numbers (upper line) shall be aligned centrally.
2. Functional descriptions shall be left aligned when only one language is used (see Figure 1).
3. For bilingual labels, functional descriptions shall be left aligned for the first language and aligned with the centre of the label for the second (see Figure 2).

Figure 1 Label justification/alignment example (one language)**Figure 2 Label justification/alignment examples (bilingual)****2.2.10 Use of case**

1. Only capital letters shall be used for tag numbers.
2. Functional descriptions should be written with leading capitals (e.g., “Compressor”).