

DEP SPECIFICATION

PIG SIGNALLERS – INTRUSIVE TYPE

DEP 31.40.21.33-Gen.

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DESIGN AND ENGINEERING PRACTICE



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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements for the design, fabrication and testing of shop fabricated intrusive type pig signallers for onshore and offshore carbon steel pipelines (except subsea) with a nominal diameter of DN 100 to DN 1400, design pressures not exceeding 250 bar (ga), and a temperature range of -20 °C to 120 °C. This DEP is not applicable to non-intrusive types of pig signallers.

Pig signallers are used to indicate the passage of a pig. Intrusive types are normally mounted on pig trap systems but may also be installed at other locations along the pipeline. It is assumed that they will be installed permanently in an open environment.

The requirements of this DEP are based on the assumption that the intrusive type pig signallers are mounted on the pipeline via a DN 50 branch connection into which the pipeline fluid will enter and pressurise the housing of the pig signaller.

The adherence to this DEP ensures that the relevant requirements of ISO 13623 for the pressure containing components of the pig signaller will be complied with.

This DEP shall be used in conjunction with Data/Requisition sheet DEP 31.40.21.95-Gen.

This is a revision of the DEP of the same title and number, dated September 2010. A summary of changes from the previous edition is given in (1.6).

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 authorised 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 pipelines in oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. Application in other facilities may also apply.

When DEPs are applied, a Management of Change (MOC) process should 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 may 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 regard 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.

1.3.2 Specific definitions

Data/Requisition Sheet	The Data/Requisition sheet DEP 31.40.21.95-Gen., which is to be used in conjunction with this DEP.
Pig	A device that can be propelled through a pipeline by fluid flow and is normally used for cleaning, batching, inspection or other activities.
Pig Signaller	A device installed on a pipeline or pig trap to give an indication of the passage of a pig. a) Intrusive type: a pig signaller having a trigger penetrating into the bore of the pipeline, which is in direct contact with the transported fluid, pressurizing the housing of the pig signaller b) Non-Intrusive type: a pig signaller that is externally mounted on the pipeline and therefore not in contact with the transported fluid and not exposed to the internal pressure in the pipeline.
Pig trap	An ancillary item of pipeline equipment, comprising a barrel, end closure and instruments, for introducing a pig into a pipeline or removing a pig from a pipeline. Pig traps are further described in DEP 31.40.10.13-Gen.

1.3.3 Abbreviations

DN	Diameter Nominal (mm)
HAZ	Heat Affected Zone

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section number is shown in brackets (). Other documents referenced by this DEP are listed in (15).

1.5 ACTION ITEMS

The Data/Requisition sheet DEP 31.40.21.95-Gen. shall be fully completed by the Principal or the Contractor as appropriate. Items requiring a statement in the Data/Requisition sheet are identified by (P) in the margin.

1.6 SUMMARY OF MAIN CHANGES

This DEP is a revision of the DEP of the same number dated September 2010. Only editorial changes have been made.

1.7 COMMENTS ON THIS DEP

Comments on this DEP may be sent to the Administrator at standards@shell.com, using the DEP Feedback Form. The DEP Feedback Form can be found on the main page of "DEPs on the Web", available through the Global Technical Standards web portal <http://www.shell.com/standards> and on the main page of the DEPs DVD-ROM.

2. COMPONENT DESCRIPTIONS AND FUNCTIONAL REQUIREMENTS

2.1 COMPONENT DESCRIPTION

The pig signaller consists of the following components:

- A trigger penetrating into the main bore of the pipe, which will be moved by a passing pig.
 - A transfer mechanism to transfer the movement of the trigger, immediately activating a signalling mechanism. The triggering toggle shall be bi-directional.
- (P) However, Principal is required to evaluate the applicability of bi-directionality.
- A pressure housing, containing the transfer mechanism connected with the trigger, having a DN 50 flange for installation onto the pipeline.
 - A mechanical and/or electrical indicator mounted externally on the pressure housing.
- (P) Signalling systems may be one of the following types, to be specified by Principal:
- a. Flag indicator with manual reset
 - b. Electrical indicator with manual/auto reset.
 - c. Flag/Electrical Indicator combined with manual/auto reset

Signalling systems should be suitable for mounting on both vertical and horizontal pipelines.

- (P) The Principal shall identify whether the Manufacturer shall provide a portable jacking tool and specify this on the Data/Requisition sheet.

NOTE: If an existing jacking tool is to be used, the Manufacturer's confirmation shall be obtained that this tool is suitable for the offered pig signaller model.

2.2 FUNCTIONAL REQUIREMENTS

The functional requirements for the pig signaller are as follows:

1. The trigger shall activate the signalling system, indicating the passage of a pig in any direction.
2. After the pig has passed the pig signaller, the internal mechanism shall re-set automatically to the initial position, as required for indicating the passage of the next pig. The mechanical indicator shall only be reset manually. The electrical indicator may be reset automatically or manually. The combined indicator may be reset automatically or manually.
3. The signalling system shall not be triggered by the flow or pressure of the pipeline fluid.
4. The trigger shall not obstruct or damage a passing pig, and the trigger shall not be damaged by a passing pig.
5. Penetration of the trigger into the main pipe shall be kept to a minimum to avoid unnecessary obstruction of the fluid flow.
6. The trigger shall be corrosion resistant over the specified design life.
7. The flag indicator placed on a horizontal pipe section is normally set in the horizontal position for "pig not passed" and vertical position for "pig passed", having a manual latch to reset to the horizontal position.
8. The trigger shall be installed in the correct orientation. The trigger axis shall be perpendicular to the pipeline axis.
9. Pig signaller indicators shall be weather proof and corrosion resistant as stated in IP65. The flag can be oriented to face any direction offering high visibility.
10. Pig signallers on pipeline sections which cannot be depressurised for pig signaller

maintenance should be fitted with:

- a. DN 50 Flanged ball valve, with or without a flanged extension, to isolate the pig signaller from the pipeline.
 - b. Portable jacking tool for safe lifting of the transfer mechanism, complete with the trigger through the isolating valve with the main pipeline under operating condition.
11. For buried pipelines, the pig signaller must be procured with an extended shaft assembly, which are available up to 2.74 m) in length.