

DEP SPECIFICATION

ON-LINE PROCESS ANALYSERS

DEP 32.31.50.10-Gen.

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DESIGN AND ENGINEERING PRACTICE



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These views are based on the experience acquired during involvement with the design, construction, operation and maintenance of processing units and facilities. Where deemed appropriate DEPs are based on, or reference international, regional, national and industry standards.

The objective is to set the standard for good design and engineering practice to be applied by Shell companies in oil and gas production, oil refining, gas handling, gasification, chemical processing, or any other such facility, and thereby to help achieve maximum technical and economic benefit from standardization.

The information set forth in these publications is provided to Shell companies for their consideration and decision to implement. This is of particular importance where DEPs may not cover every requirement or diversity of condition at each locality. The system of DEPs is expected to be sufficiently flexible to allow individual Operating Units to adapt the information set forth in DEPs to their own environment and requirements.

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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 requirements and gives recommendations for the selection, specification and installation of on-line process stream analysers, systems for sample take-off and transport of the sample, the sample conditioning systems and the disposal of sample fluids.

Analyser houses are covered by DEP 32.31.50.13-Gen.

This is a revision of the DEP of the same number dated February 2018; 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 authorised access to DEPs does not for that reason constitute an authorisation to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in refineries, upgraders, chemical plants, gas plants, exploration and production facilities and supply/distribution installations. 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
Analyser application engineering	Activity that details the scope of the analytical measurement and its application.

Term	Definition
Analyser data sheet	Compilation of technical details as a direct result of analyser application engineering.
Fast loop	Sample transport system that takes a sample from the process at one point and returns the withdrawn sample back to the process at another point.
Oxygen Service	any fluid containing more than 23.5 vol% oxygen with the balance being inert.
Piping class	Assembly of piping components, suitable for a defined service and design limits, in a piping system. Piping classes for refining and chemicals and piping classes for exploration and production are contained in DEP 31.38.01.14-Gen.
Process line	Piping used for transport of fluids (other than sample lines).
Sample	Representative portion of the product or process stream having all relevant properties of the product or the process stream itself.
Sample Conditioning System (SCS)	One or more devices that properly prepare a portion of the sample from the sample transport system for testing by the process analyser to meet the requirements of the analyser.
Sample line	Tube or pipe used for transporting the sample.
Sample pre-conditioning system	One or more devices that condition the sample (pressure, temperature, flow, change of state) so that it is suitable to be transported to the sample conditioning system. The sample pre-conditioning system forms part of the sample take-off system.
Sample probe	Device (usually in the form of a special tube) that is inserted into a defined point in the bulk of the process stream to extract a small portion as a sample.
Sample recovery system	System that collects waste sample and/or by-products from the analyser system for the purpose to either return them to an assigned point of disposal or to a suitable point in the process.
Sample take-off connection	Piping connection for the extraction of the sample from the process line and through which a sample probe can be inserted into the process.
Sample take-off point	Exact location from where the sample is extracted in the process, i.e., the location of either the tip of the sample probe or the pipe wall connection from where the sample fluid leaves the process piping.
Sample take-off system	System that includes the sample probe and downstream components up to the connection with the sample transport system.
Sample transport system	System used to transport a sample from the sample take-off, either to the sample conditioning system (and from there to the analyser) or directly to the analyser, and to return the waste sample, if any is collected, from the sample conditioning system, either to a suitable point in the process or to a suitable utility system.

Term	Definition
Sample system	Complete system that includes the sample take-off, sample transport and sample conditioning systems.
Secondary loop	Circulating loop, part of the sample transport system, which is fitted to reduce the lag time caused by components such as filters, coalescers, etc., and/or to reduce the quantity of a sample entering the analyser shelter. The secondary loop is part of the sample conditioning system.
Single line sample transport	Sample transport system that returns the waste sample to a utility system.
Total Cost of Ownership	Price of an asset plus the costs of operation.
Vendor	A Manufacturer/Supplier that supplies goods or services.

1.3.3 Abbreviations

Term	Definition
CEMS	Continuous Emission Monitoring System
FAT	Factory Acceptance Test
IP	Ingress Protection
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MSDS	Material Safety Data Sheet
OEM	Original Equipment Manufacturer
PTFE	Polytetrafluoroethylene
SAT	Site Acceptance Test
SCS	Sample Conditioning System

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 (7).

1.5 SUMMARY OF MAIN CHANGES

This is a revision of the DEP of the same number dated February 2017. This is an administrative update only to correct references to DEPs that have been involved in either a merge or a split.

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://www.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.