

DEP SPECIFICATION

ELECTRICAL HEATING SYSTEM FOR FROST HEAVE PREVENTION OF REFRIGERATED HYDROCARBON STORAGE TANKS

DEP 33.68.30.31-Gen.

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DESIGN AND ENGINEERING PRACTICE



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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the electrical heating system used for preventing frost heave of refrigerated storage tanks. It covers design, material selection, installation and testing.

This DEP is a revision of the DEP with the same number dated October 2001.

Revision was necessary in view of the changes in design of these types of tanks and for alignment with DEP 33.68.30.32-Gen.

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 new construction projects, retrofitting and the operation and maintenance in relation to exploration and production facilities, oil refineries, chemical plants, gas plants and supply/marketing installations.

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.

1.3.2 Specific definitions

Term	Definition
Certificate	Document issued by a recognized authority certifying that it has examined and, if necessary, tested a certain type of apparatus and has concluded that the apparatus complies with the relevant standard for such apparatus.
Certificate of conformity	Certificate stating that the electrical apparatus complies with the relevant standards for apparatus for potentially explosive atmospheres.
Declaration of compliance	Document issued by the Manufacturer declaring that the electrical apparatus complies with the requirements of IEC 60079-15.
Electrical resistance heat tracing	The utilisation of electric heating cables, other electric heating devices and support components that are externally applied and used to maintain or raise the temperature of fluids/materials in piping and associated equipment.
Maintain temperature	Specified temperature of the fluid or process material that the trace heating is designed to hold at equilibrium under specified design conditions.
Power output	The power (thermal) output of self-regulating heating cable is the electrical consumption measured in watts per metre of cable.
Rated value, 05-41-010, IEC 60050	Qualifying term applied to a quantity that is used in the specification of a machine or an apparatus.
Rated voltage	The voltage to which operating and performance characteristics of heating cables are referred.
Self-regulating/self-limiting heating cable	A parallel heating cable with a semi-conductive element, which responds to temperature variation by adjusting its thermal output so as to reach an equilibrium point.
Power limiting heating cable	A heating cable consisting of a metal-alloy heating element which is helically wrapped around a fibre substrate, electrically arranged between two copper conductors. The element has a Positive Temperature Coefficient characteristic and reduces its output with increased temperature.

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 (9).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a revision of the DEP of the same number dated October 2001. The following are the main, non-editorial changes:

Section	Change
2.1	strengthened the requirement for the Manufacturer to verify calculations and design of the Contractor.
2.3.1	modified references to external standards
2.3.1	added requirement for certificate of conformity
3.3	added dual units
4.1.1	added 2 nd par.