DEP SPECIFICATION

CENTRIFUGAL FANS (AMENDMENTS/SUPPLEMENTS TO ISO 13705, Annex E)

DEP 31.29.47.30-Gen.

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DESIGN AND ENGINEERING PRACTICE

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TABLE OF CONTENTS

PART I **INTRODUCTION** 4
1.1 SCOPE 4
1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS 4
1.3 DEFINITIONS 4
1.4 ACTION ITEMS 5
1.5 CROSS-REFERENCES 6
1.6 SUMMARY OF CHANGES SINCE PREVIOUS REVISION 6
1.7 COMMENTS ON THIS DEP 7

PART II **GENERAL** 8

PART III **AMENDMENTS/SUPPLEMENTS TO ISO 13705, Annex E** 9
E.1 GENERAL 9
E.2 DESIGN 9
E.3 ACCESSORIES 14
E.4 EXAMINATION, TESTING AND PREPARATION FOR SHIPMENT 15

PART IV **REFERENCES** 18

Documents
Document Sharing Hub

Full document details: SHELL 31.29.47.30 0

PART I INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for centrifugal fans and blowers that develop less than 0.35 bar (5 psi) above atmospheric pressure and have a driver rating of more than 5 kW (6.7 BHP).

This DEP is based on Annex E of ISO 13705, second edition, November 2006. Part III of this DEP amends, supplements and deletes various clauses/paragraphs of ISO 13705, Annex E.

NOTES:

1. ISO 13705 covers "Fired Heaters for General Refinery Service". Annex E of ISO 13705 covers "Centrifugal Fans for Fired Heaters". For the purposes of this DEP, the application of centrifugal fans is intended for other general services, and is not restricted to fired heaters. This DEP does not apply to HVAC fans.
2. API 560, fourth edition, September 2007 is identical to ISO 13705, second edition, November 2006.

For ease of reference, the clause numbering of ISO 13705 has been used throughout Part III of this DEP. Clauses of ISO 13705 which are not mentioned in this DEP remain applicable as written.

This is a revision of the DEP of the same number dated January 1998; see (1.6) 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 facilities related to 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 as regards 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 with the object of obtaining agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

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

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

Vendor is the term used in ISO 13705, Annex E. For the purposes of this DEP, the term Vendor shall be understood to mean Manufacturer/Supplier.

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The **Principal** is the party which initiates the project and ultimately pays for its design and construction. 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
Continuous operation	A service in which it is not expected that the compressor will have to be started/ stopped during normal plant operation. Note: This definition is independent of the requirements for a service life of 20 years and for at least 5 years uninterrupted operation.
Essential service	A service in which failure of equipment renders a plant or process unit inoperable or reduces performance to a level unacceptable to the Principal.
Hydrogen service	All process conditions with a hydrogen partial pressure greater than 0.7 MPa (102 psi).
Intermittent operation	A service in which it is expected that the compressor will be started/ stopped at unspecified intervals, e.g.: • automatic starts and stops at intervals by process operated controls; • manual starts and stops at intervals by manual control for batch processes. Note: This definition is independent of the requirements for a service life of 20 years and for at least 5 years uninterrupted operation.
Non-essential service	All services other than essential service and vital service.
Vital service	A service in which failure of equipment causes an unsafe condition of the plant or installation resulting in jeopardy to life and/or major damage (e.g., fire, explosion).

1.3.3 Abbreviations

Term	Definition
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers.
AWS	American Welding Society
ISO	International Organisation for Standardisation
NACE	National Association of Corrosion Engineers

1.4 ACTION ITEMS

A round bullet (•) in the margin next to a clause in ISO 13705, Annex E indicates that a decision by the Principal is required. These decisions shall be indicated directly on the relevant data/requisition sheet where provisions are made for them, otherwise they shall be indicated on the data/requisition sheet(s) under the heading 'Additional Requirements' or stated in the purchase order.

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1.5 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 (Part IV).

1.6 SUMMARY OF CHANGES SINCE PREVIOUS REVISION

The previous edition of this DEP was dated January 1998. Following are the main changes

Old Section	New Section	Change
Throughout the Document		Replaced API 560 Appendix E with ISO 13705 Annex E.
Part I		
E.1.1	E.1.1	Reference to DEP 31.29.42.93 deleted, added NOTE 2 and last sentence on NOTE 1.
E.1.2	E.1.2	Reference to DEP 00.00.05.05 Deleted
Part III		
E.1.2.12	E.1.14	Changed 'Steam Turbine drives' to 'variable speed drives'
E.2.1.1	E.2.1.1	Deleted first sentence
E.2.1.10	E.2.1.10	Deleted
E.2.1.16.1	E.2.1.16.1	Deleted
E.2.1.16.2	E.2.1.16.2	Deleted reference to DEP 31.10.00.94-Gen. and the second paragraph.
E.2.2.1.1	E.2.2.1.1	Deleted 'Unstiffened flat surface areas of casing walls shall not exceed 0.25 m^2 each.'
New Clause	E.2.3.4	Added new clause regarding lifting points.
E.2.5.3	E.2.5.3	Deleted
E2.5.5	E2.5.5	Modified text regarding impeller mounting.
E.2.7.1	E.2.7.1	Elaborated on torsional analysis requirements.
-	E.2.7.4	Added "remove the words "if specified" "
E.2.8.1	E.2.8.1	Deleted first and second sentence. Added requirements regarding final balancing corrections, residual unbalance response test and expansion/vibration isolation.
-	E.2.9.7	Added text regarding bearing housing seals.
E.2.10.3	E.2.10.3	Added reference to API 614.
E.2.10.4	E.2.10.4	Deleted
-	E.2.11.1.5	Added requirements for internal bolting.
E.2.11.1.1	E.2.11.1.1	Deleted requirement for material inspection certificates.
E.2.11.1.6	E2.11.1.6	Deleted 'Amended per circular 29/04'.
-	E.2.11.2.1	Added ASME section 9 as an acceptable substitute for AWS D 14.6
E.2.11.3	E.2.11.3	Deleted

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