

NORSOK STANDARD

DESIGN PRINCIPLES
ENVIRONMENTAL CARE

S-003
Rev. 2, May 1999

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CONTENTS

FOREWORD	2
INTRODUCTION	2
1 SCOPE	3
2 NORMATIVE REFERENCES	3
3 DEFINITIONS AND ABBREVIATIONS	3
3.1 Definitions	3
3.2 Abbreviations	4
4 GENERAL REQUIREMENTS	4
4.1 General	4
4.2 Environmental management	5
4.3 Waste	5
4.4 Chemicals	6
4.5 Documentation	7
5 DRILLING	7
5.1 General	7
5.2 Power systems (drilling rig)	7
5.3 Drilling systems	8
5.4 Testing	8
5.5 Drainage systems	9
5.6 Contingency planning	9
6 FIELD DEVELOPMENT	9
6.1 General	9
6.2 Emissions to air	10
6.3 Discharges to sea	12
6.4 Decommissioning	14
7 DESIGN PHASE	15
7.1 General	15
7.2 Emissions to Air	15
7.3 Discharges to sea	16
8 MODIFICATIONS	18
8.1 Modification projects	18
9 DECOMMISSIONING	18
9.1 General	18
9.2 Cleaning operations and waste management before abandonment	18
9.3 Options for disposal of offshore installations	19
9.4 Cuttings on seabed	19
ANNEX A REQUIREMENTS REGARDING EMISSIONS TO AIR AND DISCHARGES TO SEA APPLICABLE TO NORWEGIAN CONTINENTAL SHELF (NORMATIVE)	20
ANNEX B INTERNATIONAL CONVENTIONS AND PROTOCOLS (INFORMATIVE)	21

FOREWORD

NORSOK (The competitive standing of the Norwegian offshore sector) is the industry initiative to add value, reduce cost and lead time and eliminate unnecessary activities in offshore field developments and operations.

The NORSOK standards are developed by the Norwegian petroleum industry as a part of the NORSOK initiative and supported by OLF (The Norwegian Oil Industry Association) and TBL (Federation of Norwegian Engineering Industries). NORSOK standards are administered and issued by NTS (Norwegian Technology Standards Institution).

The purpose of NORSOK standards is to contribute to meet the NORSOK goals, e.g. by replacing individual oil company specifications and other industry guidelines and documents for use in existing and future petroleum industry developments.

The NORSOK standards make extensive references to international standards. Where relevant, the contents of a NORSOK standard will be used to provide input to the international standardisation process. Subject to implementation into international standards, the NORSOK standard will be withdrawn.

Annex A is normative and Annex B is informative.

INTRODUCTION

The revision 2 replaces NORSOK standard S-DP-003, rev. 1 of December 1994. The General Requirements section has been expanded to include environmental management, Waste, Chemicals and Documentation for all main sections in the standard.

1 SCOPE

This standard applies to design, construction, modifications and decommissioning of installations for offshore drilling, production and transportation of petroleum.

The objective of this document is to achieve implementation of technology which minimises adverse impacts on the ecosystem. The most cost effective technical and/or operational solutions shall be sought, based on e.g. life cycle cost analyses.

This document includes limitations for emissions to air, discharges to sea and discharges of chemicals and wastes. Specific requirements applicable to Norwegian Continental Shelf are summarised in ANNEX A.

2 NORMATIVE REFERENCES

The following standards include provisions which, through reference in this text, constitute provisions of this NORSOK standard. Latest issue of the references shall be used unless otherwise agreed. Other recognized standards may be used provided it can be shown that they meet or exceed the requirements of the standards referenced below.

NS 4753 Water Analysis

3 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

Shall	Verbal form used to indicate requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted, unless accepted by all involved parties.
Should	Verbal form used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.
May	Verbal form used to indicate a course of action permissible within the limits of the standard.
Can	Verbal form used for statements of possibility and capability, whether material, physical or casual.
Company	Company named licence operator
Displacement water	Water from tank cells with variable water bed
Ecosystem:	A biological community and its immediate chemical and physical environment.
Environment:	The term used in this context is limited to matters relating to pollution and ecology.
	Chemicals listed in annex A of the Paris Convention.

Hazardous waste	Waste which cannot be treated together with consumer wastes, either because of its size/quantity or potential environmental risk, or danger for human beings or animals
Process chemicals:	All chemicals . added to support the production and transportation of petroleum.

3.2 Abbreviations

BTEX	Benzene, toluene, ethylbenzene and xylene
CFC	Chlorofluorocarbons
CO ₂	Carbon dioxide
FPSO	Floating production, storage and off-loading
FSU	Floating storage unit
HCFC	Hydrochlorofluorocarbons
HSE	Health, safety and environment
H ₂ S	Hydrogen sulphide
LSA	Low specific activity
NMVOC	VOC excluding methane (Non methane VOC)
NO _x	Nitrogen oxides
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorobiphenyls
RVP	Reid vapour pressure
SCR	Selective catalytic reduction
SO _x	Sulphur oxides
	True Vapour Pressure
VOC	Volatile organic compounds

4 GENERAL REQUIREMENTS

4.1 General

This standard assumes that an environmental management program has been established and is maintained.

Governing documents, in the form of Acts, Regulations, Standards and Recognised Practices, shall be identified, listed, and applied in the design process.

Use of international standards and codes shall be preferred to non-standard solutions unless it is documented that the alternative solution altogether will be more optimal from an environmental and cost point of view.

The environmental requirements shall be reflected in the design and in the operation and maintenance philosophy.

The design shall comply with Company established environmental risk acceptance criteria for accidental pollution.

Intentional and/or accidental discharges to sea and emissions to air shall be minimised through design, choice of chemicals and materials as well as operation and maintenance philosophies. To assure this, experienced operational and environmental management personnel shall verify the concept before design freeze.

The planned streams of waste, emissions to air, discharges to sea and the risk for accidental spills shall be identified and quantified, and compared to environmental risk acceptance criteria or targets.

4.2 Environmental management

4.2.1 General

The environmental management system shall include identification of relevant acts and regulations, requirements to discharge/emission evaluations or restrictions requested by the authorities, as well as Company or industry environmental acceptance criteria or targets.

4.2.2 HSE Programme

A HSE programme shall be established at the beginning of each phase, and end up with a proposed HSE programme for the next phase. The HSE programme shall include, but not be limited to; HSE policy and principles, design requirements, emission targets, acceptance criteria, organisation and responsibilities, and a list of HSE activities.

4.2.3 Environmental budget

An environmental budget shall be established, for comparing alternative concepts, technical solutions and designs, or alternative decommissioning and disposal options in decommissioning studies. The budget shall include expected energy demand and chemical demand, and estimates for emissions to air and discharges to sea, as well as investment and operating costs using net present value. In evaluation of cost, the cash flow shall be discounted using the same discount factor as used by the authorities. Gas cost should be estimated as market value, minus transport cost.

All technology and concept selections shall be documented by an environmental budget that visualises achieved reductions, as well as possible penalties in form of other emissions or discharges.

4.2.4 Environmental Risk Analysis

Environmental acceptance criteria or targets shall be established for each project to cover accidental and intentional discharges to sea and emissions to air. Concepts and technical solutions shall be evaluated against owners and Company acceptance criteria, best industry practice and regulatory requirements. Decommissioning studies shall include environmental impact/risk assessment for the suggested decommissioning and disposal options.

4.3 Waste

4.3.1 General

Waste includes cuttings from drilling, wastes from production, drilling and utility areas, consumer waste and scrap metal, hazardous waste and low radioactive waste.