

Cathodic protection

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Foreword

The NORSOK standards are developed by the Norwegian petroleum industry to ensure adequate safety, value adding and cost effectiveness for petroleum industry developments and operations. Furthermore, NORSOK standards are, as far as possible, intended to replace oil company specifications and serve as references in the authorities' regulations.

The NORSOK standards are normally based on recognised international standards, adding the provisions deemed necessary to fill the broad needs of the Norwegian petroleum industry. Where relevant, NORSOK standards will be used to provide the Norwegian industry input to the international standardisation process. Subject to development and publication of international standards, the relevant NORSOK standard will be withdrawn.

The NORSOK standards are developed according to the consensus principle generally applicable for most standards work and according to established procedures defined in NORSOK A-001.

The NORSOK standards are prepared and published with support by The Norwegian Oil Industry Association (OLF), The Federation of Norwegian Industry, Norwegian Shipowners' Association and The Petroleum Safety Authority Norway.

NORSOK standards are administered and published by Standards Norway.

Introduction

Edition 3 of this NORSOK standard is made to reflect the introduction of the International Standard ISO 15589-2, *Petroleum and Natural Gas Industries – Cathodic Protection of Pipeline – Offshore Pipelines*, for CP of submarine pipelines, the update of DNV RP B401 and recent experiences with hydrogen induced cracking for high strength high alloyed pipeline materials.

Specific requirements to submarine pipeline systems are given in clause 8.

1 Scope

This NORSOK standard gives requirements for CP design of submerged installations and seawater containing compartments, and manufacturing and installation of sacrificial anodes.

Specific requirements to submarine pipeline systems are given in clause 8.

2 Normative and informative references

The following standards include provisions and guidelines which, through reference in this text, constitute provisions and guidelines 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 the requirements of the referenced standards.

2.1 Normative references

ASTM D1141,	Specification for Substitute Ocean Water
AWS D1.1,	Structural Welding Code - Steel
DNV-RP-B401,	Cathodic Protection Design
EN 287-1,	Qualification test of welders - Fusion welding - Part 1: Steels
EN ISO 15607,	Specification and qualification of welding procedures for metallic materials – General rules (ISO 15607:2003)
EN ISO 15609-1,	Specification and qualification of welding procedures for metallic materials – Welding procedure specification – Part 1: Arc welding (ISO 15609-1:2004)
EN ISO 15614-1,	Specification and qualification of welding procedures for metallic materials – Welding procedure test – Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004)
EN 10204,	Metallic products - Types of inspection documents
ISO 1461,	Metallic coatings - Hot-dip galvanized coating on fabricated ferrous products - Requirements
ISO 8501-1,	Preparations of steel substrates before application of paints and related products - Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
ISO 15589-1,	Petroleum and natural gas industries – Cathodic protection of pipeline transportation systems – Part 1: On-land pipelines
ISO 15589-2,	Petroleum and natural gas industries – Cathodic protection of pipeline – Part 2: Offshore pipelines
NORSOK M-001,	Materials selection
NORSOK M-501,	Surface Preparation and Protective Coating

2.2 Informative references

DNV-RP-F112,	Design of duplex stainless steel subsea equipment exposed to cathodic protection
EN 10002-1,	Metallic materials – Tensile testing – Part 1: Method of test at ambient temperature
NORSOK M-WA-01,	Design guideline to avoid hydrogen induced stress cracking in subsea duplex stainless steels

3 Terms, definitions, abbreviations and symbols

For the purposes of this NORSOK standard, the following terms, definitions, abbreviations and symbols apply.

3.1 Terms and definitions

3.1.1

shall

verbal form used to indicate requirements strictly to be followed in order to conform to this NORSOK standard and from which no deviation is permitted, unless accepted by all involved parties