

ISO 15589-2:2004-05 (E)

Petroleum and natural gas industries - Cathodic protection of pipeline transportation systems - Part 2: Offshore pipelines

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Symbols and abbreviated terms	3
5	CP system requirements	3
5.1	General	3
5.2	Selection of CP systems	4
6	Design parameters	6
6.1	General	6
6.2	Protection potentials	7
6.3	Design life	9
6.4	Design current densities	9
6.5	Coating breakdown factors	11
7	Galvanic anodes	12
7.1	Design of system	12
7.2	Selection of anode material	13
7.3	Electrochemical properties	13
7.4	Anode shape and utilization factor	13
7.5	Special mechanical and electrical considerations	13
8	Anode manufacturing	14
8.1	Pre-production test	14
8.2	Coating	15
8.3	Anode core materials	15
8.4	Aluminium anode materials	15
8.5	Zinc anode materials	16
9	Galvanic anode quality control	16
9.1	General	16
9.2	Steel anode cores	16
9.3	Chemical analysis of anode alloy	17
9.4	Anode mass	17
9.5	Anode dimensions and straightness	17
9.6	Anode core dimensions and position	18
9.7	Anode surface irregularities	18
9.8	Cracks	18
9.9	Internal defects, destructive testing	19
9.10	Electrochemical quality control testing	20
10	Galvanic anode installation	21

11	Impressed-current CP systems	22
11.1	Current sources and control	22
11.2	Impressed-current anode materials	22
11.3	System design	22
11.4	Manufacturing and installation considerations	23
11.5	Mechanical and electrical considerations	23
12	Documentation	24
12.1	Design, manufacturing and installation documentation	24
12.2	Commissioning procedures	25
12.3	Operating and maintenance manual	25
13	Operation, monitoring and maintenance of CP systems	26
13.1	General	26
13.2	Monitoring plans	26
13.3	Repair	26
	Annex A (normative) Galvanic anode CP design procedures	27
	Annex B (normative) Performance testing of galvanic anode materials	35
	Annex C (normative) Monitoring of CP systems for offshore pipelines	37
	Annex D (informative) Laboratory testing of galvanic anodes for quality control	43
	Annex E (informative) Interference	45
	Annex F (informative) Pipeline design for CP	48
	Bibliography	54