DIN EN ISO 35103:2020-01 (E)

Petroleum and natural gas industries - Arctic operations - Environmental monitoring (ISO 35103:2017); English version EN ISO 35103:2019

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Abbreviated terms **5**

5 General requirements for environmental monitoring **6**

5.1 Application of ISO management system standards 6
5.2 Objectives of environmental monitoring 6
5.3 Specification for monitoring 6
5.4 Planning a monitoring programme 7
5.4.1 Programme specification 7
5.4.2 Programme adjustment 8
5.4.3 Action on non-compliance 8
5.5 Spatial scales 8
5.5.1 General 8
5.5.2 Near-field 8
5.5.3 Far-field 8
5.5.4 Regional 8
5.5.5 Transboundary 8
5.6 Temporal scales 8
5.6.1 Design 8
5.6.2 Variation in environmental aspects 9
5.6.3 Natural fluctuations 9
5.7 Environmental aspects 9
5.7.1 Types of environmental aspects 9
5.7.2 Normal, abnormal and emergency conditions 9
5.7.3 Control aspect in response to monitoring 10
5.8 Environments and components 10
5.9 Baseline conditions 10
5.10 Parameters 10
5.10.1 Selection of parameters 10
5.10.2 Accuracy 10
5.10.3 Detection limits 11
5.10.4 Units and other specifications 11
5.10.5 Physical parameters 11
5.10.6 Chemical parameters 11
5.10.7 Biological parameters 11
5.10.8 Associated measurements 12
5.10.9 Position fixing 12
5.11 Modelling 12
5.12 Sampling 13
5.13 Analytical methods 13
5.14 Toxicity tests 13
5.15 Statistical methods 13
5.16 Costs of monitoring 13
5.17 Environmental monitoring report 13

6 Factors to be considered for Arctic offshore environments 14
6.1 Characteristics of the Arctic 14
6.2 Polar location 14
6.2.1 Remoteness 14
6.2.2 Positioning 14
6.2.3 Day/night cycle 14
6.3 Low temperatures 14
6.4 Seasonal characteristics 15
6.5 Ice environments 15
6.6 Endemic species 15
6.6.1 General 15
6.6.2 Identification 16
6.6.3 Ice flora and fauna 16
6.7 Human communities 16
6.7.1 General 16
6.7.2 Indigenous peoples 16
6.7.3 Local and traditional knowledge 16
7 Monitoring requirements for offshore oil and gas sector in the Arctic 16
7.1 General 16
7.2 Offshore life cycle phases 16
7.3 Offshore environmental monitoring programme design 17
7.3.1 Objectives of offshore environmental monitoring 17
7.3.2 General aspects of environmental monitoring programme 17
7.3.3 Offshore environmental aspect and environmental impact identification 17
7.3.4 Sampling and analysis 18
7.3.5 Reference sampling 18
7.3.6 Near-field sampling 19
7.3.7 Far-field sampling 19
7.3.8 Regional sampling 20
7.3.9 Field specific stations 20
7.3.10 Marine toxicity testing 20
7.4 Environmental monitoring programme implementation 20
7.4.1 Pre-development 20
7.4.2 Exploration 21
7.4.3 Construction and commissioning 22
7.4.4 Production phase 22
7.4.5 Decommissioning and facility removal 23
7.4.6 Site restoration 23
7.4.7 Logistics, air and sea transport and accommodation 23
7.4.8 Monitoring during emergency conditions 24
Bibliography 25