ISO 20074:2019-07 (E)

Petroleum and natural gas industry - Pipeline transportation systems - Geological hazard risk management for onshore pipeline

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 2

3 Terms,definitionsandabbreviatedterms 2
3.1 Terms and definitions 2
3.2 Abbreviated terms 5

4 Pipeline geohazard risk management program 5
4.1 Key principles 5
4.2 Requirements for a PGMP 5
4.3 Elements of a PGMP 6
4.3.1 General 6
4.3.2 Preliminary engineering and route selection phase 7
4.3.3 Detailed design phase 9
4.3.4 Construction phase 10
4.3.5 Operation and maintenance phase 12

5 Riskidentification 13
5.1 General 13
5.2 Geohazard inventory 17
5.3 Desktop data analysis 17
5.4 LiDAR and remote sensing imagery analysis 18
5.5 Field investigation 18
5.5.1 Field investigation techniques 18
5.5.2 Field investigation scope 18
5.5.3 Field investigation recommendations 18
5.6 Geotechnical investigation 19

6 Risk assessment 19
6.1 General 19
6.2 Assessment systems and methods 19
6.2.1 Assessment systems 19
6.2.2 Assessment methods 20
6.3 Assessment for regional pipeline geohazard susceptibility 22
6.4 Assessment for individual pipeline geohazard 22

7 Risk mitigation 23
7.1 General 23
7.2 Mitigations 23
7.2.1 Physical and procedural mitigations 23
7.2.2 Short-term and long-term mitigation measures 24

8 Techniques and methods for geohazard risk management 25

9 Data management 28

Annex A (informative) Guidelines for pipeline route selection 29

Annex B (informative) Field investigation recommendations 31

Annex C (informative)Exampleofclassificationofgeologicalenvironmentalconditionsby complexity level 33

Annex D (informative) Example qualitative assessment method 35

Annex E (informative) Example semi-quantitative assessment method 45

Annex F (informative) Potential methods to mitigate risk 54

Annex G (informative)Somekeyinfluencingfactorsofselectedgeohazards 61

Bibliography 66