ISO 19901-5:2021-11 (E)

Petroleum and natural gas industries - Specific requirements for offshore structures - Part 5: Weight management

Contents

Page

Foreword vi

Introduction viii

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 Abbreviations 6

5 Principles of weight management 7
5.1 General 7
5.2 Weight management during project lifecycle phases 7
5.3 Weight management objectives 7
5.3.1 Objectives during conceptual design phase 7
5.3.2 Objectives during FEED, detail engineering and construction phases 8
5.3.3 Objectives during operations and decommissioning phases 8
5.4 Illustration of weight versus time 8
5.5 Loading conditions 9
5.5.1 General 9
5.5.2 Typical loading conditions 9

6 Control Weights 10
6.1 General 10
6.2 Purpose 11
6.3 Budget weights and NTE weights 11
6.3.1 Budget Weights 11
6.3.2 Reserves 11
6.3.3 NTE weights 12
6.4 Loading conditions and parameters 12
6.5 Control weights during operations phase 12

7 Weight management during project execution phases 12
7.1 Conceptual design 12
7.1.1 General 12
7.1.2 Predicted weight 13
7.1.3 Conceptual design weight 13
7.1.4 Upper bound weight constraint 13
7.1.5 Weight estimating 14
7.1.6 Key documentation 14
7.1.7 Estimating principles 15
7.1.8 Deliverables 17
7.2 FEED 18
7.2.1 General 18
7.2.2 Weight management plan 18
7.2.3 Weight management procedure 19
7.2.4 Weight reporting 19
7.2.5 Weight checking and verification 20
7.3 Detail engineering 21

7.3.1 General 21
7.3.2 Weight management plan 21
7.3.3 Weight management procedure 21
7.3.4 Weight reporting 21
7.3.5 Weight checking and verification 23
7.4 Construction 23
7.4.1 General 23
7.4.2 Weight database 23
7.4.3 Weight reporting 24
7.4.4 Weighing of assemblies 24
7.5 Installation and HUC 24
7.6 Operations 24
7.6.1 General 24
7.6.2 Weight management procedure 24
7.6.3 Weight database 25
7.6.4 Legacy weight databases 25
7.6.5 Laydown and storage drawings 25
7.6.6 Decommissioning 26

8 Requirements for suppliers' weight data and weighing of tagged equipment and assembled discipline bulks 26
8.1 General 26
8.2 Submission of weight data 26
8.3 Weighing requirements 27
8.3.1 Equipment 27
8.3.2 Discipline bulks 27
8.4 Weighing procedure 27
8.5 Weighing devices 28
8.5.1 Type of weighing device 28
8.5.2 Calibration of weighing devices 28
8.5.3 Maximum relative uncertainty for weighing devices 28
8.5.4 Capacity of weighing device 29
8.5.5 Spare weighing devices and ancillaries 29
8.6 Witnessing of weighing 29
8.7 Scheduling of weighings 29
8.8 Environmental conditions during a weighing 29
8.9 Weighing operation 29
8.10 Temporary items present during a weighing 30
8.11 Permanent items not installed during a weighing 30
8.12 Weighing certificate 30

9 Requirements for weighing of major assemblies 31
9.1 General 31
9.2 Weighing procedure 31
9.3 Weighing system 32
9.3.1 Load cells 32
9.3.2 Read-out devices 32
9.3.3 Uncertainty of weighing system 32
9.3.4 Calibration of load cells 33
9.3.5 Capacity of weighing system components 33
9.3.6 Spare load cells and ancillaries 33
9.3.7 Hydraulic jacking system 33
9.3.8 Levelness of the assembly during the weighing 34
9.4 Preparations prior to the weighing 34
9.4.1 Notification and witnessing of weighings 34
9.4.2 Environmental conditions during a weighing 34
9.4.3 Weighing prediction report 34
9.4.4 Temporary items during the weighing 35
9.5 Weighing operation 35
9.5.1 Number of results recorded 35
9.5.2 Readings of load cells and level criteria 36

9.5.3 Consistency of results 36
9.5.4 CoG calculations 36
9.5.5 Weighing report 36
9.5.6 Weighing certificate 37

Annex A (informative) Commentary 38

Annex B (informative) Weighing certificates 42

Annex C (informative) Example control weight summary 46

Annex D (informative) Variable weight 47

Annex E (informative) Example decision-making RAPID matrix 51

Annex F (informative) Weighing result uncertainty 53

Annex G (informative) Weight database structure 56

Annex H (informative) Weight management guidelines for concrete structures 57

Annex I (informative) Coordinate systems 60

Annex J (informative) Weight allowances and reserves 62

Annex K (informative) Weight management competencies 64

Bibliography 65