ISO 20257-2:2021 (E)

Installation and equipment for liquefied natural gas — Design of floating LNG installations — Part 2: Specific FSRU issues

Contents

Foreword

1 Scope

2 Normative references

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions
3.2 Abbreviated terms

4 Basis of design

4.1 General description of FSRU
4.2 Main design criteria for process facilities
4.3 Reliability, availability and maintainability of LNG floating installation
4.4 Specific requirements for FSRU operating as LNG carrier
4.5 Specific FSRU studies
4.5.1 General
4.5.2 Environmental impact of seawater intake and discharge study
4.5.3 Recirculation study
4.5.4 Scour protection study

5 Specific health, safety and environmental issues

5.1 General
5.2 Environmental considerations related to water heating and cooling issues
5.3 Safety considerations
5.3.1 General requirements
5.3.2 Layout constrains
5.3.3 Layout constraints with respect to surroundings
5.3.3.1 Applicability
5.3.3.2 Qualitative analysis
5.3.3.3 Confirmation by calculation
5.3.4 Layout constraints with respect to facility arrangement
5.3.4.1 Qualitative analysis
5.3.4.2 Confirmation by calculation
5.3.5 Risk prevention measures
5.3.5.1 General
5.3.5.2 Active fire protection
5.3.5.2.1 Active fire protection philosophy
5.3.5.2.2 Systems design
5.3.5.2.3 Water systems
5.3.5.2.4 Foam systems
5.3.5.2.5 Dry chemicals systems
5.3.5.3 Fire, cold spill and gas detection system
5.3.5.4 Drainage systems
5.3.5.5 Emergency response
5.3.5.6 Safety integrity levels

6 Mooring and stationkeeping

7 Hull design

8 LNG storage

8.1 Specific requirements for cargo tank pressure management

8.2 Specific requirements for LNGC overpressure protection
8.3 Rollover risk

9 Transfer systems

9.1 General
9.2 Send-out natural gas: NG gas transfer requirements
9.2.1 Functional requirements
9.2.2 Transfer systems design
9.2.2.1 Composition
9.2.2.2 Articulated piping solutions
9.2.2.3 Flexible pipe solutions
9.2.3 Emergency disconnection
9.2.3.1 Quantitative risk analysis inputs
9.2.3.2 Emergency disconnection system
9.2.3.3 Flange-to-flange connection
9.2.4 Operating envelope
9.2.4.1 General
9.2.4.2 Operating of transfer systems equipped with EDS
9.2.4.3 Operating of transfer systems not equipped with EDS
9.3 LNG sampling

10 BOG handling and recovery

10.1 General
10.2 LNG tank design pressure flexibility
10.3 Specific requirements for recondenser
10.4 Specific requirements for gas compressors
10.4.1 General
10.4.2 Specific functional requirements for LD compressors
10.4.3 Specific functional requirements for HD compressors
10.4.4 Specific functional requirements for HP or MSO compressors

11 Regasification equipment requirements

11.1 LNG pumps
11.1.1 General
11.1.2 Functional requirements
11.1.3 Materials selection
11.1.4 In-tank LNG pump
11.1.5 HP LNG pump
11.2 LNG vaporization system
11.2.1 Functional requirements
11.2.2 Vaporization type
11.2.3 Materials selection
11.2.4 Protective coating
11.2.5 Marine growth
11.2.6 Stability/vibration
11.2.7 Safety relief valves
11.3 Trim heater
11.4 Venting from regasification systems

12 Gas send out

12.1 High integrity pressure protection system
12.1.1 Send-out pressure control
12.1.2 Typical description of HIPPS
12.1.3 Design requirements for HIPPS
12.2 Send-out gas metering
12.2.1 Uses of send-out gas metering
12.2.2 Measurement devices type
12.2.3 Accuracy
12.2.4 External influences
12.2.5 Gas chromatograph – Gas analyser
12.2.6 Sparing philosophy
12.2.7 Z-configuration
12.3 Odorization systems

13 Utilities

13.1 General
13.2 Cooling and heating medium
13.2.1 Cooling medium
13.2.1.1 General
13.2.1.2 Seawater for equipment
13.2.1.3 Freshwater for equipment
13.2.2 Heating medium
13.2.2.1 Seawater
13.2.2.2 Steam
13.2.3 Nitrogen system
13.2.4 Fuel gas

14 Process and safety control systems

14.1 General requirements
14.2 Interfaces between FSRU and gas export connection
14.3 Communication onshore/offshore

15 Security management

16 Commissioning

17 Inspection and maintenance

17.1 General requirements
17.2 Cargo tank
17.3 In-tank LNG pump
17.4 Regasification equipment
17.4.1 HP LNG pump
17.4.2 LNG vaporizer
17.5 Recondenser
17.6 Handling/Crane equipment

18 Preservation and corrosion protection

19 Conversion of existing unit to floating LNG installations

Annex A (informative) Regasification system description

A.1 General
A.2 Open loop (direct contact) vaporizer
A.3 Open loop (intermediate fluid) vaporizer
A.4 Closed loop vaporizer
A.5 Combined vaporizers
A.6 Ambient air vaporizers

Page count: 40