ISO 15138:2018 (E)

Petroleum and natural gas industries — Offshore production installations — Heating, ventilation and air-conditioning

Contents

Foreword

1 Scope

2 Normative references

3 Terms and definitions

4 Abbreviated terms

5 Design

5.1 General
5.2 Development of design basis
5.2.1 Orientation and layout
5.2.1.1 Objective
5.2.1.2 Functional requirements
5.2.1.3 Detailed requirements
5.2.2 Hazardous area classification and the role of HVAC
5.2.2.1 Objective
5.2.2.2 Functional requirements
5.2.2.3 Detailed requirements
5.2.3 Environmental conditions
5.2.3.1 Objective
5.2.3.2 Functional requirements
5.2.3.3 Detailed requirements
5.2.3.3.1 External meteorological conditions
5.2.3.3.2 Maximum sea temperature
5.2.3.3.3 Direct and diffuse solar radiation intensities
5.2.3.3.4 Internal environmental conditions
5.2.4 Natural/mechanical ventilation
5.2.4.1 Objective
5.2.4.2 Functional requirements
5.2.4.3 Detailed requirements
5.2.5 Selection of controls philosophy
5.2.5.1 Objective
5.2.5.2 Functional requirements
5.2.5.3 Detailed requirements
5.2.5.3.1 General
5.2.5.3.2 HVAC shut down philosophy
5.2.5.3.3 Control and monitoring — Normal operation
5.2.5.3.3.1 Dedicated and integrated HVAC panels
5.2.5.3.3.2 Local control of fans
5.2.5.3.3.3 Fire/gas damper controls
5.2.5.3.3.4 Loss of differential pressure
5.2.5.3.3.5 Temperature control
5.2.5.3.4 Control and monitoring — Emergency conditions
5.2.6 Operating and maintenance philosophy
5.2.6.1 Objective
5.2.6.2 Functional requirements
5.2.6.3 Detailed requirements
5.2.7 Materials and corrosion
5.2.7.1 Objective
5.2.7.2 Functional requirements

5.2.7.3 Detailed requirements
5.2.8 Design margins and calculations
5.2.8.1 Objective
5.2.8.2 Functional requirements
5.2.8.3 Detailed requirements
5.2.9 Wind-tunnel and computational fluid dynamics modelling
5.2.9.1 Objective
5.2.9.2 Functional requirements
5.2.9.3 Detailed requirements
5.2.9.3.1 General
5.2.9.3.2 Computational fluid dynamics — Preparation for analysis
5.2.9.3.2.1 General
5.2.9.3.2.2 Computer model
5.2.9.3.2.3 Boundary layer modelling
5.2.9.3.2.4 Computational model
5.2.9.3.3 Computational fluid dynamics — Analysis
5.2.9.3.3.1 Helideck wind environment
5.2.9.3.3.2 Gas turbine exhaust plume dispersal
5.2.9.3.3.3 Natural and partially natural ventilation
5.2.9.3.3.4 Gas-leak dispersion
5.2.9.3.3.5 Fire combustion gas/smoke dispersion
5.2.10 Performance standards
5.2.10.1 Objective
5.2.10.2 Functional requirements
5.2.10.3 Detailed requirements
5.3 System design — General
5.3.1 Natural ventilation
5.3.1.1 Objective
5.3.1.2 Functional requirements
5.3.1.3 Detailed requirements
5.3.2 Mechanical ventilation
5.3.2.1 Objective
5.3.2.2 Functional requirements
5.3.2.3 Detailed requirements
5.3.2.3.1 General
5.3.2.3.2 Differential pressure
5.3.2.3.3 Effect of wind
5.3.2.3.4 Inlets and outlets
5.3.2.3.5 Duct systems
5.3.3 Secondary ventilation systems
5.3.3.1 Objective
5.3.3.2 Functional requirements
5.3.3.3 Detailed requirements
5.3.4 Black start
5.4 Area-specific system design
5.4.1 Process and utility areas
5.4.1.1 Objective
5.4.1.2 Functional requirements
5.4.1.3 Detailed requirements
5.4.2 Living quarters
5.4.2.1 Objective
5.4.2.2 Functional requirements
5.4.2.3 Detailed requirements
5.4.2.3.1 General
5.4.2.3.2 Extract system
5.4.2.3.3 Heating, cooling and humidification
5.4.2.3.4 Galley systems
5.4.2.3.5 Laundry systems
5.4.2.3.6 Temporary LQ modules
5.4.3 Temporary refuge
5.4.3.1 Objective
5.4.3.2 Functional requirements
5.4.4 Drilling and drilling utility areas
5.4.4.1 Objective

5.4.4.2 Functional requirements
5.4.4.3 Detailed requirements
5.4.4.3.1 General
5.4.4.3.2 Shale-shaker units and cutting cleaning units
5.4.4.3.3 Mud tanks
5.4.4.3.4 Air cleaners
5.4.4.3.5 Cement units
5.4.5 Gas turbine
5.4.5.1 Objective
5.4.5.2 Functional requirements
5.4.5.3 Detailed requirements
5.4.6 Emergency plant ventilation
5.4.6.1 Objective
5.4.6.2 Functional requirements
5.4.6.3 Detailed requirements
5.4.7 Battery and charger rooms
5.4.7.1 Objective
5.4.7.2 Functional requirements
5.4.7.3 Detailed requirements
5.4.8 Laboratories
5.4.8.1 Objective
5.4.8.2 Functional requirements
5.4.8.3 Detailed requirements
5.4.9 Purge air systems
5.4.9.1 Objective
5.4.9.2 Functional requirements
5.4.9.3 Detailed requirements
5.4.10 Rooms protected by gaseous extinguishing agents
5.4.10.1 Objective
5.4.10.2 Functional requirements
5.4.10.3 Detailed requirements
5.4.11 Engine-room ventilation
5.4.11.1 Objective
5.4.11.2 Functional requirements
5.4.12 Watertight compartments
5.4.12.1 Objective
5.4.12.2 Functional requirements
5.4.12.3 Detailed requirements
5.4.13 Air locks
5.4.13.1 Objective
5.4.13.2 Functional requirements
5.4.13.3 Detailed requirements
5.4.14 Stairs and escape routes
5.5 Equipment and bulk selection
5.6 Installation and commissioning
5.7 Operation and maintenance

Annex A (normative) Equipment and bulk selection

A.1 General
A.2 Louvers and hoods
A.2.1 Function
A.2.2 Functional requirements
A.3 Moisture separators and filters
A.3.1 Function
A.3.2 Functional requirements
A.4 Heating coils and unit heaters
A.4.1 Function
A.4.2 Functional requirements
A.4.2.1 General
A.4.2.2 Fluid heaters
A.4.2.3 Electric heaters
A.4.2.4 Unit heaters
A.5 Cooling coils and fan coil units
A.5.1 Function

A.5.2 Functional requirements
A.5.2.1 General
A.5.2.2 DX cooling coils
A.5.2.3 Fluid cooling coils
A.5.2.4 Fan coil units
A.6 Humidifiers
A.6.1 Function
A.6.2 Functional requirements
A.7 Fans
A.7.1 Function
A.7.2 Functional requirements
A.7.3 Fans
A.7.3.1 Fan motors
A.8 Sound attenuation
A.8.1 Function
A.8.2 Functional requirements
A.9 Fire dampers
A.9.1 Function
A.9.2 Functional requirements
A.9.2.1 General
A.9.2.2 Components and indicators
A.9.2.3 Performance
A.10 General dampers
A.10.1 Function
A.10.2 Functional requirements
A.10.2.1 General
A.10.2.2 Volume-control or balancing dampers
A.10.2.3 Pressure-relief and pressure-control dampers
A.10.2.4 Shut-off/gas dampers
A.10.2.5 Modulating dampers
A.11 Grilles and diffusers
A.11.1 Function
A.11.2 Functional requirements
A.12 Air handling units
A.12.1 Function
A.12.2 Functional requirements
A.12.2.1 General
A.12.2.2 Louvers
A.12.2.3 Filters
A.12.2.4 Heaters
A.12.2.5 Cooling coils
A.12.2.6 Humidifiers
A.12.2.7 Fans
A.12.2.8 Mixing dampers (air recirculation systems)
A.12.2.9 Access consideration
A.12.2.10 Controls and instrumentation
A.13 Refrigeration packages
A.13.1 Function
A.13.2 Functional requirements
A.13.2.1 General
A.13.2.2 Refrigeration compressors
A.13.2.3 Refrigeration condensers
A.13.2.4 Water-cooled condensers
A.13.2.5 Air-cooled condensers
A.13.2.6 Evaporators
A.13.2.7 Piping
A.13.2.8 Controls
A.14 Constant-volume units
A.14.1 Function
A.14.2 Functional requirements
A.14.2.1 General
A.14.2.2 Constant-volume regulators in CVUs
A.14.2.3 Air heaters in CVUs
A.14.2.4 Sound attenuators in CVUs

A.15 Dehumidifiers
A.15.1 Function
A.15.2 Functional requirements
A.16 Ducts
A.16.1 Function
A.16.2 Functional requirements

Annex B (normative) Installation and commissioning

B.1 Installation
B.1.1 Joints
B.1.2 Hangers and supports
B.1.3 Equipment installation
B.1.4 Duct insulation
B.1.5 Insulation jacketing
B.1.6 Identification
B.1.7 Cleaning and protection
B.1.8 Leakage testing
B.2 Commissioning

Annex C (informative) Operation and maintenance

C.1 General
C.2 Loss or reduction of ventilation
C.3 Routine operational checks

Annex D (informative) Datasheets

D.1 Datasheet for HVAC equipment — Louvers
D.2 Datasheet for HVAC equipment — Moisture separators and filters
D.3 Datasheet for HVAC equipment — Heating coils
D.3.1 Datasheet for HVAC equipment — Fluid heating coils
D.3.2 Datasheet for HVAC equipment — Electric heating coils
D.3.3 Datasheet for HVAC equipment — Unit heaters
D.4 Datasheet for HVAC equipment — Cooling coils
D.4.1 Datasheet for HVAC equipment — DX cooling coils
D.4.2 Datasheet for HVAC equipment — Fluid cooling coils
D.4.3 Datasheet for HVAC equipment — Fan coil units
D.5 Datasheet for HVAC equipment — Humidifier
D.6 Datasheet for HVAC equipment — Fans
D.7 Datasheet for HVAC equipment — Sound attenuators
D.8 Datasheet for HVAC equipment — Fire dampers
D.9 Datasheet for HVAC equipment — Dampers
D.9.1 Datasheet for HVAC equipment — Mechanical dampers
D.9.2 Datasheet for HVAC equipment — Manual dampers
D.10 Datasheet for HVAC equipment — Grilles and diffusers
D.11 Datasheet for HVAC equipment — Air handling units
D.12 Datasheet for HVAC equipment — Refrigeration package
D.13 Datasheet for HVAC equipment — Constant-volume units
D.14 Datasheet for HVAC equipment — Dehumidifier, sorption type

Annex E (normative) Standard data for flanges

Page count: 140