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**Napeljave in oprema za utekočinjeni zemeljski plin - Načrtovanje plavajočih napeljav za utekočinjeni zemeljski plin - 2. del: Posebne zahteve za plavajoča skladišča z enotami za uplinjanje (FSRU) (ISO 20257-2:2021)**

Installation and equipment for liquefied natural gas - Design of floating LNG installations - Part 2: Specific FSRU issues (ISO 20257-2:2021)

Anlagen und Ausrüstung für Flüssigerdgas - Auslegung von schwimmenden Flüssigerdgas-Anlagen - Teil 2: Besondere Anmerkungen zu FSRU (ISO 20257-2:2021)

Installations et équipements de gaz naturel liquéfié - Conception des installations flottantes de GNL - Partie 2: Questions spécifiques aux FSRU (ISO 20257-2:2021)

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75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment
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EN ISO 20257-2

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## Installation and equipment for liquefied natural gas - Design of floating LNG installations - Part 2: Specific FSRU issues (ISO 20257-2:2021)

Installations et équipements de gaz naturel liquéfié -  
Conception des installations flottantes de GNL - Partie  
2: Questions spécifiques aux FSRU (ISO 20257-2:2021)

Anlagen und Ausrüstung für Flüssigerdgas - Auslegung  
von schwimmenden Flüssigerdgas-Anlagen - Teil 2:  
Besondere Anmerkungen zu FSRU (ISO 20257-2:2021)

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## European foreword

This document (EN ISO 20257-2:2021) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 282 "Installation and equipment for LNG" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2021, and conflicting national standards shall be withdrawn at the latest by December 2021.

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**Installation and equipment for  
liquefied natural gas — Design of  
floating LNG installations —**

**Part 2:  
Specific FSRU issues**

**iTeh STANDARD PREVIEW**  
*Installations et équipements de gaz naturel liquéfié — Conception des  
installations flottantes de GNL —  
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### Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 9, *Liquefied natural gas installations and equipment*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 282, *Installation and equipment for LNG*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 20257 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Installation and equipment for liquefied natural gas — Design of floating LNG installations —

## Part 2: Specific FSRU issues

### 1 Scope

This document provides specific requirements and guidance for the design and operation of floating LNG storage and regasification units (FSRU) described in ISO 20257-1.

This document is applicable to offshore, near-shore or docked FSRUs and to both new-built and converted FSRUs.

This document includes requirements to the jetty when an FSRU is moored to a jetty.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20257-1:2020, *Installation and equipment for liquefied natural gas — Design of floating LNG installations — Part 1: General requirements*

AGA 9, *Measurement of Gas by Multipath Ultrasonic Meters*

AGA 10, *Speed of Sound in Natural Gas and Other Related Hydrocarbon Gases*

EN 1776, *Gas infrastructure — Gas measuring systems — Functional requirements*

EN 12186, *Gas infrastructure — Gas pressure regulating stations for transmission and distribution - Functional requirements*

ISO 13734, *Natural gas — Organic components used as odorants — Requirements and test methods*

EN 14382, *Safety devices for gas pressure regulating stations and installations — Gas safety shut-off devices for inlet pressures up to 100 bar*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 61511 (all parts), *Functional safety — Safety instrumented systems for the process industry sector*

ISO 5168, *Measurement of fluid flow — Procedures for the evaluation of uncertainties*

ISO 6976, *Natural gas — Calculation of calorific values, density, relative density and Wobbe indices from composition*

ISO 8943, *Refrigerated light hydrocarbon fluids — Sampling of liquefied natural gas — Continuous and intermittent methods*

ISO 12213-1, *Natural gas — Calculation of compression factor — Part 1: Introduction and guidelines*

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ISO 12213-2, *Natural gas — Calculation of compression factor — Part 2: Calculation using molar-composition analysis*

ISO 13709, *Centrifugal pumps for petroleum, petrochemical and natural gas industries*

ISO 16903, *Petroleum and natural gas industries — Characteristics of LNG, influencing the design, and material selection*

ISO 17089-1, *Measurement of fluid flow in closed conduits — Ultrasonic meters for gas — Part 1: Meters for custody transfer and allocation measurement*

CODE IGC *International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk*, International Maritime Organization (IMO)

OIML R 137-1, *Gas meters — Part 1: Metrological and technical requirements*

OIML R 137-2, *Gas meters — Part 2: Metrological controls and performance tests*

**3 Terms, definitions and abbreviated terms****3.1 Terms and definitions**

For the purposes of this document, the terms and definitions given in ISO 20257-1:2020 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

**3.1.1****fiscal metering**

metering aimed to define the quantity and financial value of hydrocarbon product transaction

**3.1.2****custody transfer**

physical transfer of hydrocarbon product that results in change in ownership and/or a change in responsibility

**3.2 Abbreviated terms**

ALARP	as low as reasonably practicable
BOG	boil-off gas
CLV	closed loop vaporizer
EDS	emergency disconnection system
ERC	emergency release coupling
ESD	emergency shut down
FSRU	floating storage and regasification unit
GCU	gas combustion unit
HAZOP	hazard and operability (study)

HD	high duty
HIPPS	high integrity pressure protection system
HP	high pressure
HVAC	heating, ventilation and air conditioning
HW	hot water
IFV	intermediate fluid vaporizer
IR	infrared
LD	low duty
LNG	liquefied natural gas
LP	low pressure
MAC	manual alarm call
MOP	maximum operating pressure
MSO	minimum send out
NG	natural gas
NPSH	net positive suction head
OEM	original equipment manufacturer
OESD	Offloading Emergency Shut Down
OLV	open loop (direct contact) vaporizer
ORV	open rack vaporizer
QRA	quantitative risk analysis
RAM	reliability, availability, maintainability
SCV	submerged combustion vaporizer
SIL	safety integrity level
SIS	safety instrumented system
UV	ultraviolet

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## 4 Basis of design

### 4.1 General description of FSRU

[Figure 1](#) illustrates a typical arrangement of FSRU facilities, showing an FSRU berthed to a single jetty. The arrangement can differ in case of use of other mooring designs.