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# Olie- og naturgasindustri – Arbejde under arktiske forhold – Arbejdsmiljø

Petroleum and natural gas industries – Arctic operations – Working environment

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DS projekt: M317850

ICS: 75.020

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First edition  
2017-10-12

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## **Petroleum and natural gas industries — Arctic operations — Working environment**

*Industries du pétrole et du gaz naturel — Opérations en Arctique —  
Environnement de travail*



Reference number  
ISO 35101:2017(E)

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## Foreword

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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)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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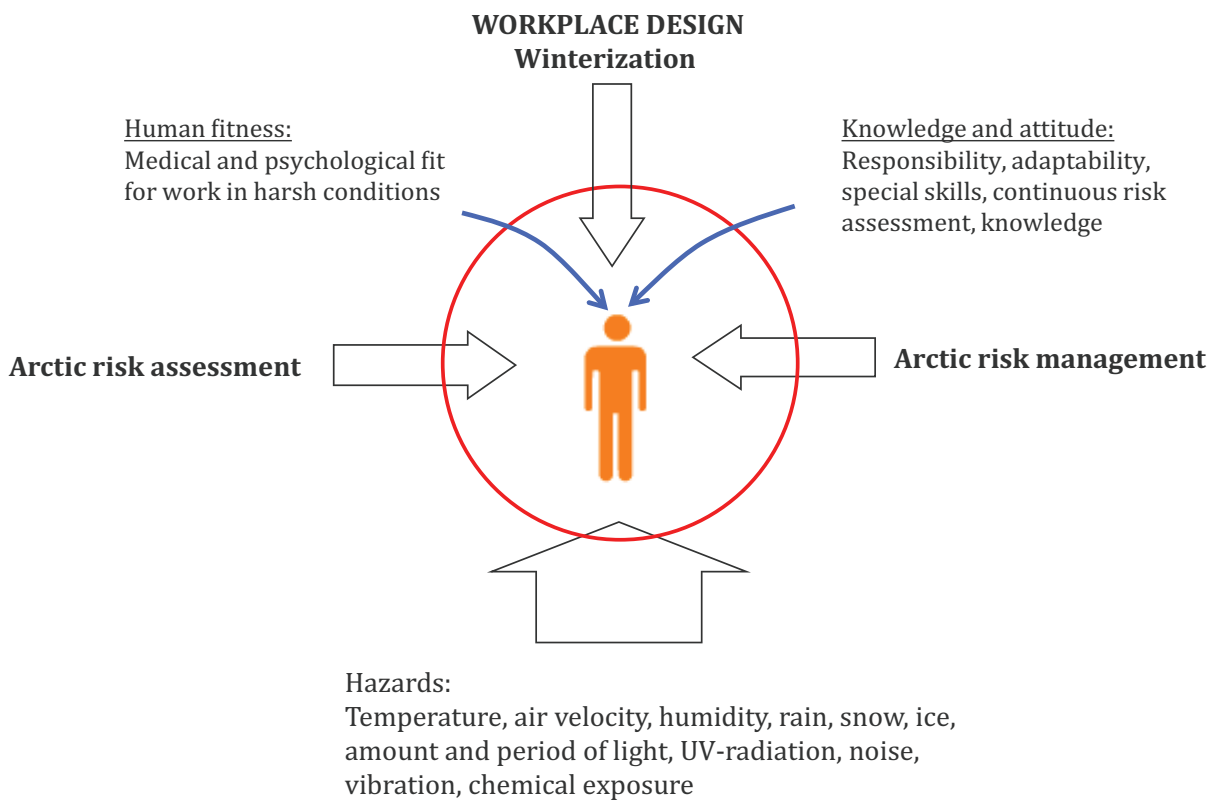
For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 8, *Arctic operations*.

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## Introduction

Workers in the petroleum and natural gas industries face a number of stressors from the physical and psychosocial environment when working in the Arctic. These include prolonged periods of darkness (polar winter) and light (polar summer), remoteness, noise and vibration, low humidity and cold climate. The combination of different working environment factors can affect people's health and safety. Cold-climate locations, low temperatures and wind can directly affect both equipment (e.g. operability, reliability and integrity) and people (e.g. frostbite, hypothermia and performance decrement). In turn, affected equipment can affect the health and safety of personnel, and poor personnel performance can likewise have a detrimental effect on equipment. It is important to consider and assess all these relationships in order to have confidence in production and health, safety and environmental (HSE) risks at facilities in cold climates. This is illustrated in [Figure 1](#). Based on the outcome of the assessment, approaches for cold-climate risk management should address all aspects of winterization, from prevention through facility design and specification through to working procedures. In addition to this, personal protective equipment (including clothing) may be necessary.



**Figure 1 — Hazards and preventive measures to protect people in Arctic environment**



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# Petroleum and natural gas industries — Arctic operations —

## Working environment

### 1 Scope

This document describes the working environment that can be expected when operating oil and gas facilities in Arctic environments/climate. This document provides principles and generic guidelines for the design and operation of fixed and floating oil and gas facilities both onshore and offshore.

The aim of this document is to ensure optimal health, safety, human performance and decision-making conditions for people working on oil and gas facilities in Arctic conditions.

This document applies to the design and operation of new facilities and structures, and to modification of existing facilities for operation in the Arctic environment. This also includes offshore and onshore exploration and accommodation units for such activities.

This document is divided into three main parts.

- The first part ([Clause 5](#)) describes the general principles and guidelines for risk management.
- The second part ([Clause 6](#)) describes the general working environment (working environment hazards found in many workplaces and provides some threshold limit values (TLVs) and design references that can be especially challenging in Arctic conditions.
- The third part ([Clause 7](#) to [Clause 9](#)) addresses the climatic conditions expected in the Arctic. [Clause 8](#) describes working environment design and technical solutions, while [Clause 9](#) describes working environment operational requirements for prevention and management of cold-related problems.

### 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 Guide 73](#), *Risk management — Vocabulary*

[ISO 5349-1](#), *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 1: General requirements*

[ISO 5349-2](#), *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 2: Practical guidance for measurement at the workplace*

[ISO 11064-6](#), *Ergonomic design of control centres — Part 6: Environmental requirements for control centres*

[ISO 11079:2007](#), *Ergonomics of the thermal environment — Determination and interpretation of cold stress when using required clothing insulation (IREQ) and local cooling effects*

[ISO 19901-1](#), *Petroleum and natural gas industries — Specific requirements for offshore structures — Part 1: Metocean design and operating considerations*

[ISO 19906:2010](#), *Petroleum and natural gas industries — Arctic offshore structures*

[ISO 31000](#), *Risk management — Principles and guidelines*

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[EN 12464-1](#), *Light and lighting — Lighting of work places — Part 1: Indoor work places*

[EN 12464-2](#), *Light and lighting — Lighting of work places — Part 2: Outdoor work places*

EN 12665, *Light and lighting — Basic terms and criteria for specifying lighting requirements*