

NUI International Diving Seminar 2023

Revision of NORSOK U-100 & U-101

Input by Arnfinn Anfindsen, NORSOK EG-UB Chairman





NORSOK EG-UB



Mandate



**Responsibility for the Expert
Groups**



Members

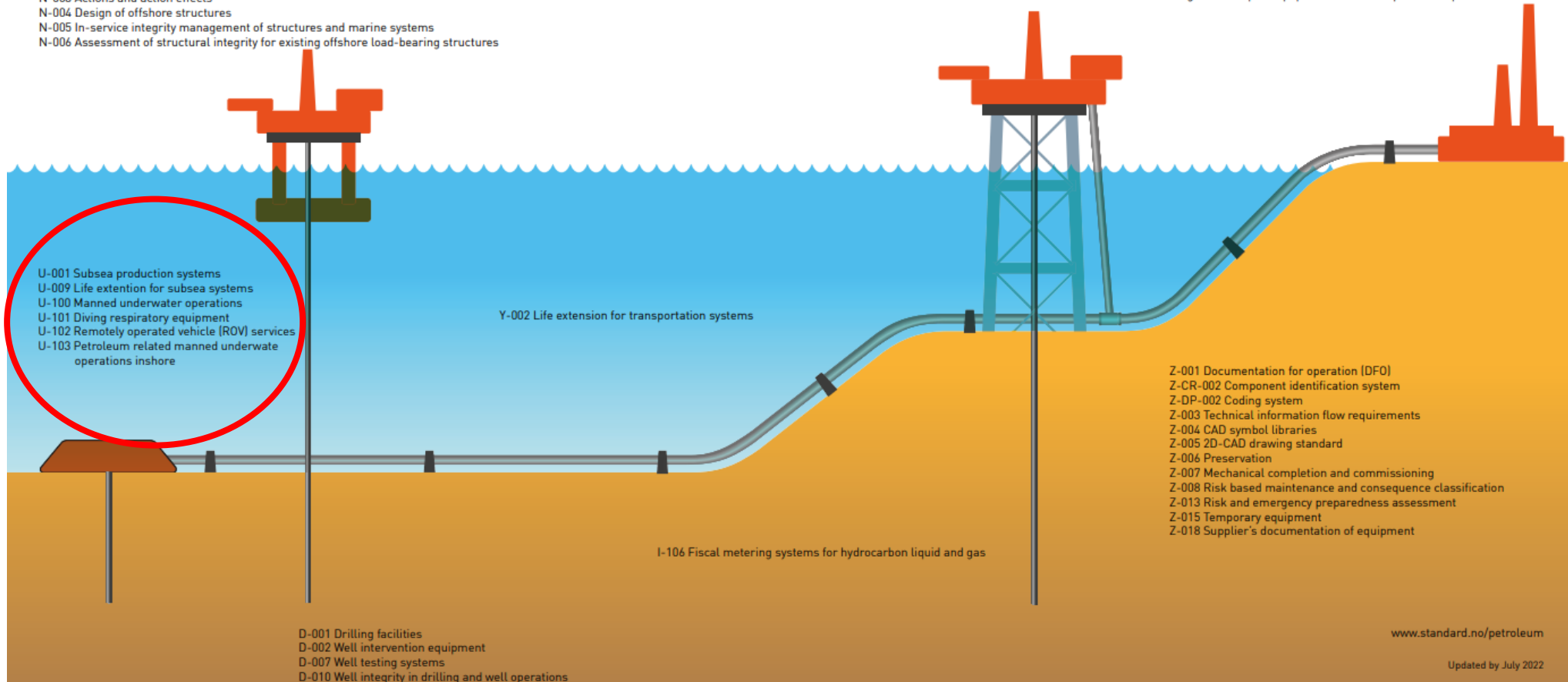
- M-001 Materials selection
- M-004 Piping and equipment insulation
- M-101 Structural steel fabrication
- M-102 Structural aluminium fabrication
- M-120 Material data sheets for structural steel
- M-121 Aluminium structural material
- M-122 Cast structural steel
- M-123 Forged structural steel
- M-501 Surface preparation and protective coating
- M-503 Cathodic protection
- M-506 CO2 corrosion rate calculation model
- M-601 Welding and inspection of piping
- M-630 Material data sheets and element data sheets for piping

- P-002 Process system design
- R-001 Mechanical equipment
- R-002 Lifting equipment
- R-003 Safe use of lifting equipment
- I-001 Field instrumentation
- I-002 Safety and automation system (SAS)
- L-001 Piping and valves
- L-002 Piping system layout, design and structural analysis
- L-003 Piping details
- L-004 Piping fabrication, installation, flushing and testing
- L-005 Compact flanged connections
- H-002 Sanitary systems
- H-003 Heating, ventilation and air conditioning (HVAC)

- S-001 Technical safety
- S-002 Working environment
- S-003 Environmental care
- T-101 Telecom systems
- T-003 Telecom systems for mobile offshore units
- E-001 Electrical systems
- C-001 Living quarters area
- C-002 Architectural components and equipment
- C-004 Helicopter decks on offshore installations

- N-001 Integrity of offshore structures
- N-003 Actions and action effects
- N-004 Design of offshore structures
- N-005 In-service integrity management of structures and marine systems
- N-006 Assessment of structural integrity for existing offshore load-bearing structures

- M-650 Qualification of manufacturers of special materials
- M-710 Qualification of non-metallic sealing materials and manufacturers
- WA-S-006 HSEQ evaluation of suppliers and HSEQ requirements in contract
- R-005 Safe use of lifting and transport equipment in onshore petroleum plants



EG UB NOROK Standards as pr. November 2023

U Underwater operations

Standards in this area describe underwater operations inshore and offshore including diving respiratory equipment.

Published standards

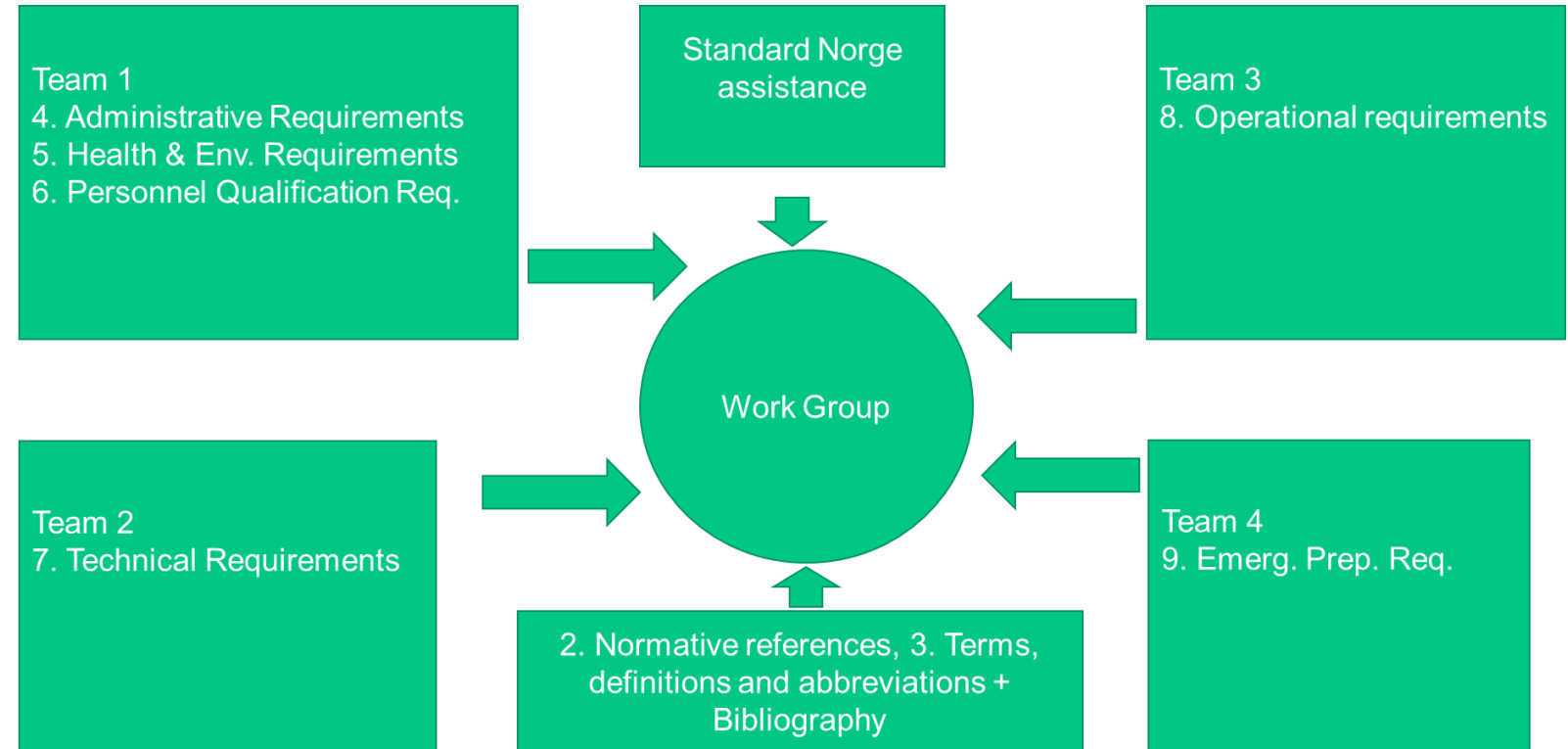
- [U-100 Manned underwater operations \(Edition 5, December 2015, corrected version 2016-05-09\) / Bemannede undervannsooperasjoner \(Utgave 5, desember 2015\)](#)
- U-101 Diving respiratory equipment (ed. 2, January 2013)
- U-102 Remotely operated vehicle (ROV) services (2020)
- U-103 Petroleumrelaterte bemannede undervannsooperasjoner inshore (2019) / Petroleumrelaterte bemannede undervannsooperasjoner inshore (2019)

NORSOK U-100 revision method



Revision workgroup members(22)

- Standard Norge
- Operators
- Contractors
- Worker organizations
- Diving doctors
- DnV
- NUI
- Diving schools
- Legislator (PSA)
- Specialists as required



Divided in teams with team leaders responsible for specific chapters and organizing group meetings as required

Special topics reviewed by the whole workgroup

NORSOK U-100 Revision Cyclis



Mandate approved
04.02.2020

Work Group Approval
28.09.2023

Kick off 20.01.2021

Include comments
01.05 - 28.09.2023

Expert Group Approval
05.10.2023

Work group meetings
20.02.2021-15.02.2023

Industry consultation
01.03 – 01.05.2023

Sector Board
Petroleum 12.10-
07.12.2023

Expert group approval
15.02.2023

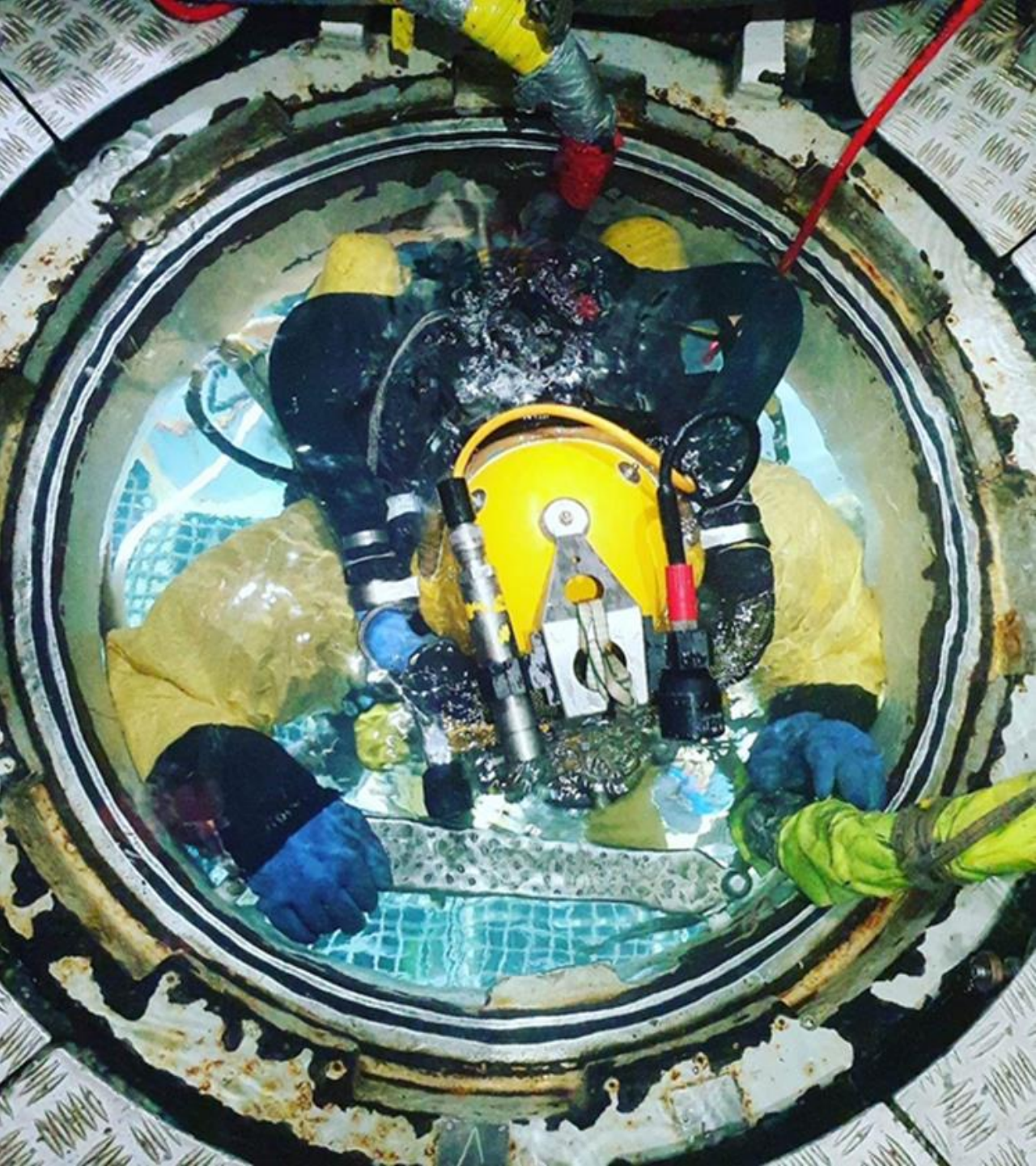
Publication

Diving operations

Main changes



- NORSOK U-100:2023 when published will supersede NORSOK U-100:2015
- New title “manned underwater operation” (MUO) changed to “diving operation”.
- New structure layout inclusion of three new clauses (Clause 11, Clause 12 and Clause 13).
- Non-saturation bell diving with air or nitrox (TUP) has been included as a separate diving method in addition to Surface oriented diving (air or nitrox) and Saturation bell diving (heliox).
- Harmonization with the “companion” NORSOK standards U-101, U-102 and U-103, industry guidelines like IMCA and IOGP



Changes cont.

- The requirement for a “dive-free day” is adjusted from a requirement to a recommendation.
- Inclusion of “4-man bell run”
- Change of requirements for “umbilical length”
- New Annex B.4 (TUP) and B.10 (FA & Diving Medicine Training, Surf. Orient. Supv)

Status revisjon («ISO-fication») of NORSOK standard U-101 Respiratory equipment

Bergen International Diving Seminar

2023-11-07/08

Input by Arnfinn Anfindsen NORSOK EG-UB Chairman





Evolution of the U-101

- Origin:
 - Common Dept. of Energy (UK-DoE)/
 - Norwegian Petroleum Directorate (NPD) Guideline
- First edition: 1999
- Revision: 2010-2013

Product information:

This NORSOK standard applies to design and testing of BA for use in MUO down to a maximal depth as specified by the manufacturer and limited to 400 msw.

This NORSOK standard may be applied for testing and assessment of any BA intended for use in MUO.

NOTE This NORSOK standard does not apply to BA intended for use only within the scope of one of the European Standards (EN) mentioned in Introduction.

NORSOK
Standard

NORSOK U-101:2013

Published: 2013-01-23

Language: English

Diving respiration equipment

Pusteutstyr for dykking



Reference Number:
NORSOK U-101:2013 (en)

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Working group (under IOGP)

- 33 experts
- 9 countries represented:
- Australia, Austria, Denmark, France, Italy, Netherlands, Norway, UK, USA
- 16 meetings so far
- Last meeting 26th October 2023
- «Heavy» scientific forum of experts – things take time!
- New document is planned for ISO enquiry in 2024

Name	Company	Country
Albier, Eric	INPP	France
Anthony, Gavin	Gavins	UK
Arnfindsen, Arnfinn	Aker BP	Norway
Blatherwick, Stephen	JFD	UK
Brekken, Rudolf	Equinor	Norway
Cote, Clarice	Navy Experimental Dive Unit	US
Damsgaard, Bo	TotalEnergies	Denmark
Dommartin, Hubert	Aqualung Group	France
Eu, Jim	Woodside	Australia
Gregori, Fabrice	Aqualung Group	France
Himmens, Ian	Stanian Test Systems Ltd	UK
Lecerf, Isabelle	INPP	France
Lønnechen, Øyvind	PSA	Norway
Løseth, Kim	NUI	Norway
Lusby, Nigel	Shell	Netherlan
Marr, Bill	Navy Experimental Dive Unit	US
McGinn, Robyn	USN	US
Mentink, Marco	Smit	Netherlan
Morgan, Connie	Kirby Morgan Dive Systems	US
Morgan, John Paul	Kirby Morgan Dive Systems	US
Mott, Blair	Kirby Morgan Dive Systems	US
Negretti, Marilena	ENI E&P Division	Italy
Newsum, Philip	Association of Divers International	US
Parker, Martin	AP Diving	UK
Peyron, Nicolas	Aqualung Group	France
Rafferty, Peter	JFD	UK
Rusden, Joe	Shell	Netherlan
Segadal, Kåre	NUI	Norway
Sieber, Arne	IEEE	Austria
Sjølie, Stian	Standards Norway	Norway
Skiple, Cecilie	Standards Norway	Norway
Ward, Mike	Kirby Morgan Dive Systems	US
Warkander, Dan	University of Buffalo	US

Diving Respiratory Equipment



Title:

Respiratory equipment - Breathing apparatus performance requirements for diving and hyperbaric applications

Scope:

This document specifies minimum respiratory performance requirements for testing and assessment of breathing apparatus used for diving and hyperbaric applications to depths specified by the manufacturer but limited to a maximum depth of 500 m (51 bar).

This document does not apply to breathing apparatus intended for use within the scope of European standards listed below:

- EN 250;
- EN 15333;
- EN 13949; and
- EN 14143.

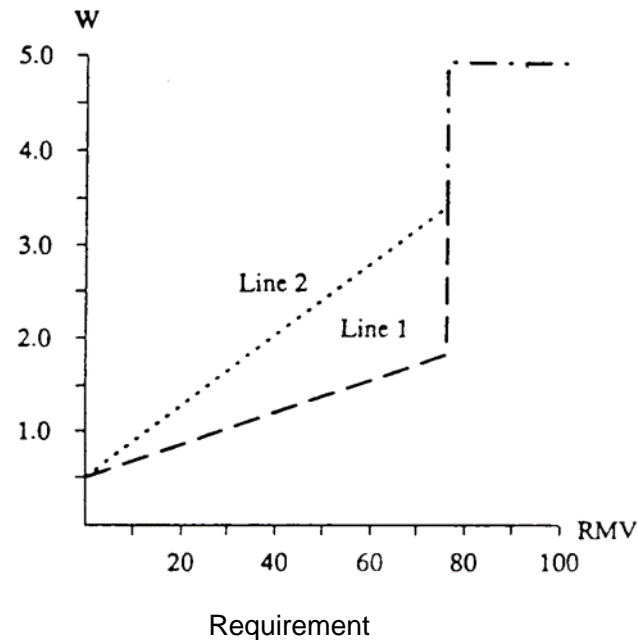
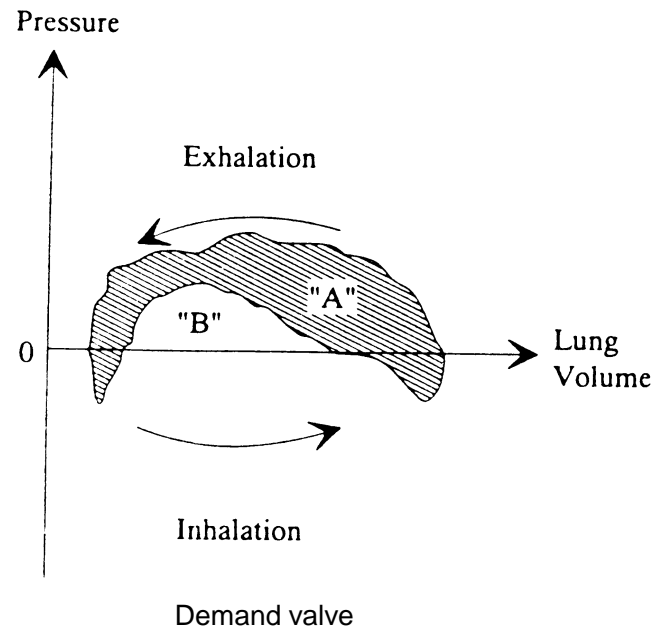
Why ISO document

- **Purpose and justification of the proposal**
 - The new ISO standard will offer international accepted minimum requirements for BA installed in any diving vessel. BA tested and accepted to this standard will be acceptable wherever the vessel will operate. Therefore manufacturers, operators and classification societies will have common accepted qualification requirements and unnecessary cost related to different requirements can be avoided



Discussion Items

- Scope: relation to EN-standards, performance or equipment standard
- Units: **m**, msw, **bar**, MPa, **mbar**, kPa
- Definitions of different BAs (bailout etc)
- WOB requirements: dependence on depth and gas composition
- WOB definition:



How to comment!

If you have any comments to existing NORSOK standards, please send to petroleum@standard.no

Please note that standards are subject to review at least every five years and your comments will be saved until upcoming review.





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