

NORSOK standard U-103

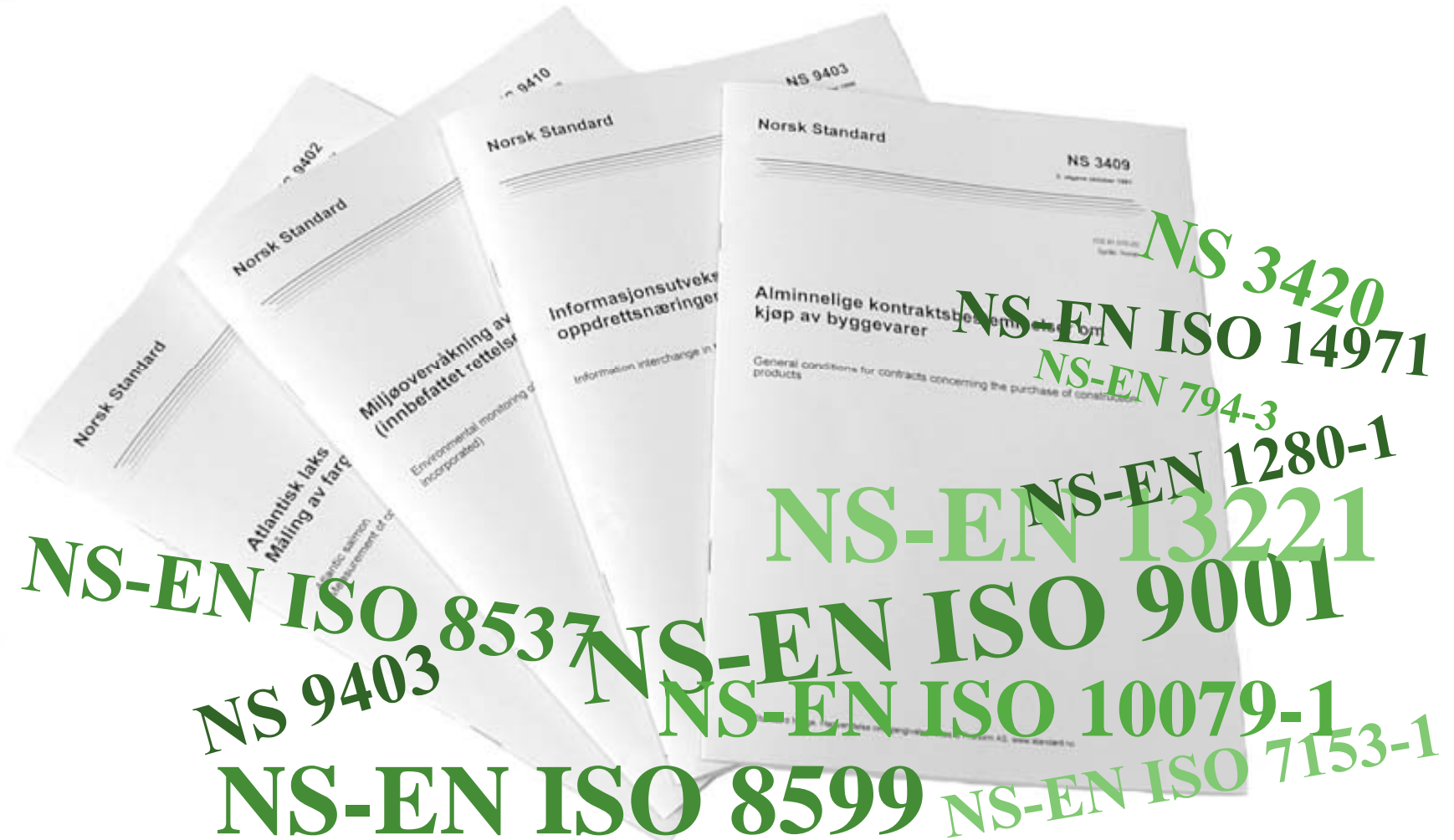
**Petroleum related
manned underwater operations
inshore**

Kåre Segadal, NUI

Overview

- Standardization work
- Standards Norway
- Petroleum standardization: NORSOK
- Organization of the work
- Progress U-103

Standards – what is it?



Standardization

Nothing new

In the Indus Valley civilization was brick measures standardised already for around 4000 years ago, and there were provisions for how they should be added in the pattern. The buildings were located by a standardized development plan, and the weight, destination and ornaments on the jars were also established.

Standards

- Description of a **product**, a **system** or a **process**
- A suggested **alternative**, but other options are possible
- Made by **stakeholders** in need for system and regulations in the market
- Are **voluntary** to use

Main principles of standardization

- **Openness**
 - Everybody can participate; companies, public authorities, research and development, consumers, labour unions
- **Voluntary**
 - Based on voluntary participation from stakeholders, and interested groups
- **Consensus**
 - solutions or positions to be developed through a consensus based process

Why standards?

Economic benefits

”Results of the macroeconomic analysis show the economic benefits of standardization to be approximately 1% of the gross national product”

Source: Economic benefits of standardization,
DIN German Institute for Standardization

Impact of standards

”Using a coherent standards system
saves
projects:

5 % on Capex and 13 % on schedule”

Source: IPA benchmark statistics report

Benefits from standards, as described by an oil & gas major

- Cost reduction - increase business efficiency
- Simplify design and procurement; variety control
- Interchangeability of equipment
- Promote stable and global market
- Enhance technical integrity
- Safety, health and protection of the environment
- Maximise availability, minimise lost revenue
- Establish a common technology base
- Technology transfer / sharing best practice / remove barriers to trade

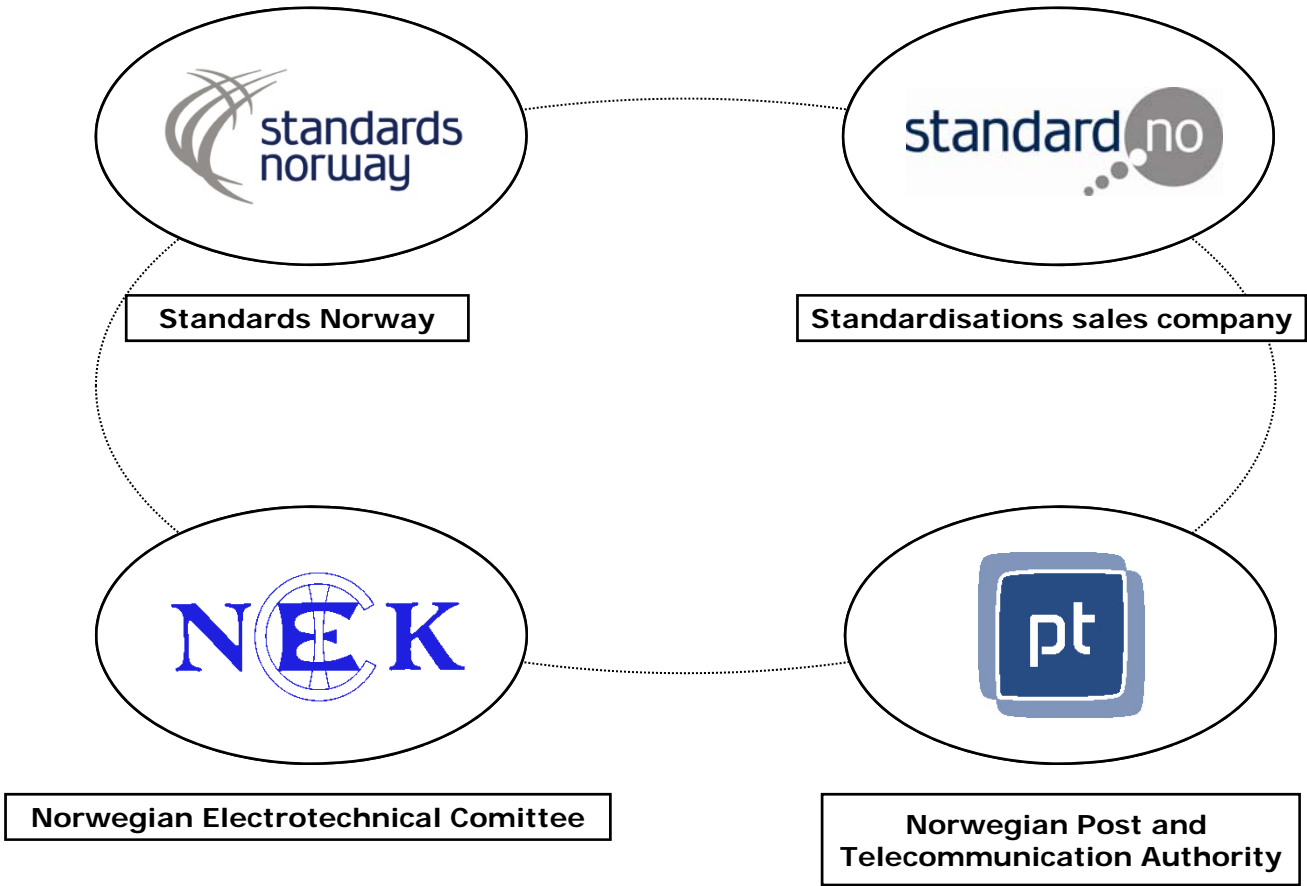
Standardization policy of an oil & gas major

- Maximize use of common industry standards (ISO/ IEC if possible)
- Minimize additional company requirements
- Ensure variations justified (technical and commercial)
- Ensure continuous improvement (feedback from users)
- Influence external standards bodies. Participate actively in the technical committees and working groups of key external standards

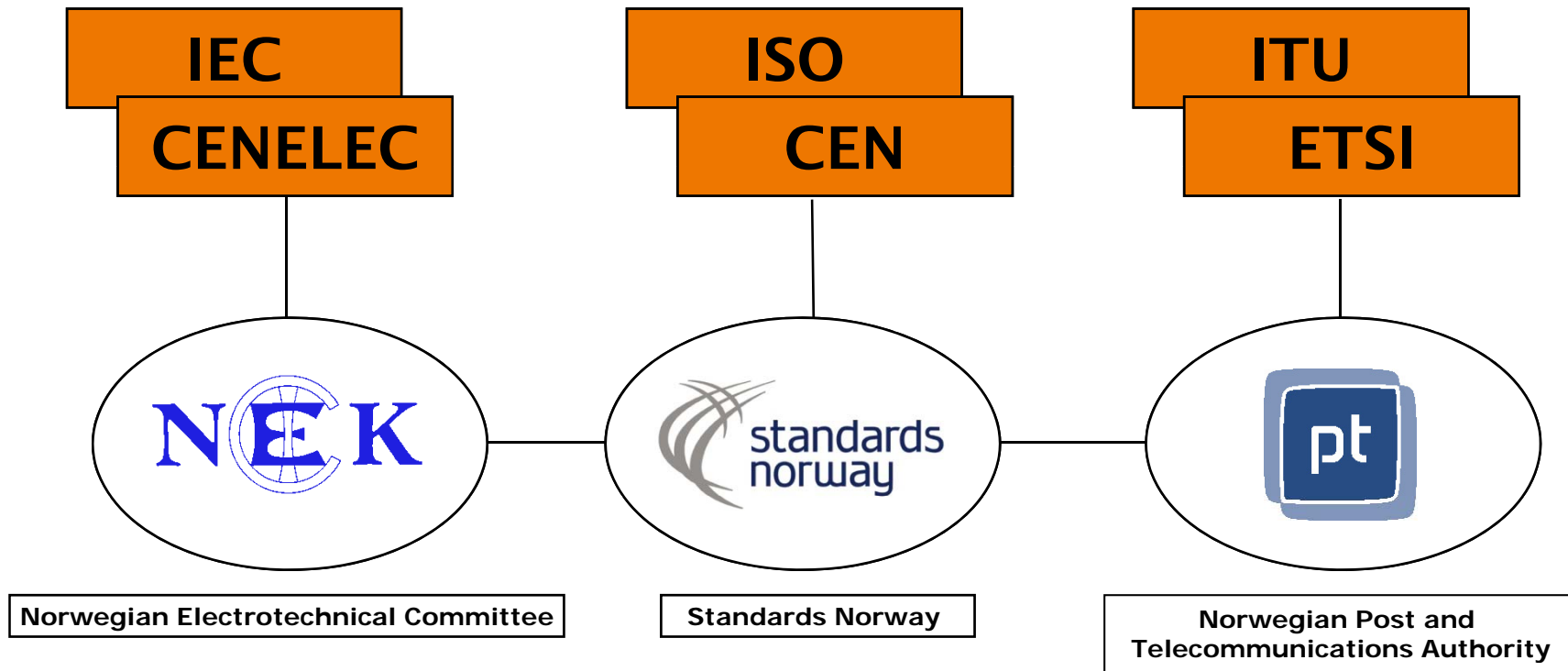
Standards and regulations

- Joint regulations issued by The Petroleum Safety Authority Norway consists primarily of **functional requirements**
- The regulations refers to standards as a means of describing **acceptable technical solutions**
- **Other solutions** can be used, but the safety level needs to be documented
- There is a well established tradition for close **tri-partite cooperation** during development of standards, norms and regulations

Standardization Organizations in Norway



Organizations

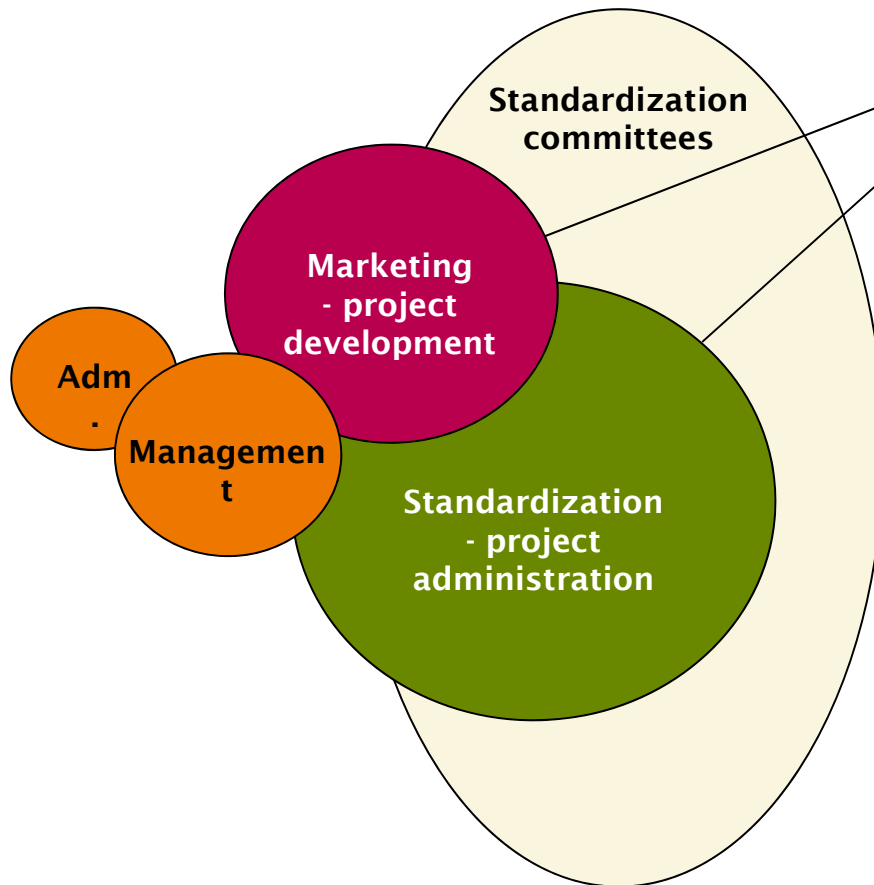


Standards Norway

- A private and independent non-profit member organisation
- Established in 2003 through a merger of four standardization bodies having their roots back to 1923
- Develops standards for all fields (except electro technical and telecommunication)
- Adopts annually 1200 -1300 Norwegian Standards
- Is the national member of Norway in CEN and ISO
- Employs 70 persons; mainly individuals educated at university level (overall in standardization: approx. 100)
- Majority shareholder of Standard Online AS, marketing and selling Norwegian Standard and related publications

Standards Norway

Activity chart



Important areas:

ICT
Petroleum industry
Management systems (quality and environment)
Building, Construction and Real Estate
Design for all
Materials, technology, machinery and safety
Transportation, skips and safety at sea
Product safety
Security
Social responsibility
Services
Health
Food
Fishery and agriculture
Working environment and consumer issues
e-business

Standardization in the Norwegian Petroleum industry



necessary supplements / deviations
areas that are not covered

Petroleum Standardization in Norway

Vision and goals

VISION

Excellent standards give continuous improvement of Safety, Health and Environment, - and increased added value in the Norwegian petroleum industry

Petroleum Standardization in Norway

Vision and Goals

GOAL No 1: Access to and use of standards of high quality

- **Actively contribute to the development and use of international standards covering the needs of Norwegian petroleum industry.**
- **Actively contribute to the development and use of national- / industry standards (NS / NORSOK) covering the identified gap between the international standards and the Norwegian needs.**
- **An efficient promotion and experience feedback system.**

Petroleum Standardization in Norway
Vision and Goals

GOAL No 2: Effective standardization activities

- Ensure an effective and focused use of industry experts.
- Ensure an effective and focused management, organisation and work in the standardization bodies

History of NORSOK

A Norwegian initiative for reducing development and operation costs for the offshore oil and gas industry.

NORSOK- The competitive standing of the Norwegian offshore sector.

Initiated in 1993.

Objectives of NORSOK standards

Significant contribution to cost reductions

- Common requirements for operating companies and suppliers (replace company specifications)
- Functional requirements replacing detailed specifications

Ownership and financing of NORSOK standards

- Intellectual property rights (IPR) belong to The Norwegian Oil Industry Association and The Federation of Norwegian Industries.
- Standards Norway is managing the IPR on behalf of the owners.
- Financing is by The Norwegian Oil Industry Association and The Federation of Norwegian Industries, The Petroleum Safety Authority Norway, The Norwegian Shipowner's Association and governmental grants.

Principles of NORSOK standards

- Defines acceptable level of safety
- Refers to international standards wherever possible
- Employ functional requirements as far as possible
- Limits requirements to "good enough"
- Short and precise

Initial set of NORSOK standards

- Prepared by project groups comprising of 150 experts from three Norwegian oil companies
- A total of 6000 comments received from 30 companies and organisations, including authorities
- A total of 88 standards established at end of 1994

Standardization in the Norwegian petroleum industry

- **Sector Board Petroleum Industry**,
 - is managing the standardization activities in the Norwegian petroleum sector.
- **Project Manager**
 - reports to the Sector Board and performs the administration of all activities, including the Norsok standards.
- **Expert groups**
 - are doing the real standardization work through:
 - appointed participants in international standardization work.
 - initiating and managing “ad hoc Norsok project groups” for revision and development of Norsok standards
- **An Expert group is a forum, where:**
 - Development and use of excellent standards is the main focus
 - Exchange of experiences and knowledge across company borders
 - Networking
- **Project groups**

Updated 2008-11-20

Standards Norway Sector Board
Petroleum Industry

Project Manager
Jan G Eriksson

Expert Groups

K114 Sector Committee Petroleum Industry Chairman: Rolf Nordaunet, Norsk Industri (Vetco Gray)			Mirror Committee to ISO/TC 67 Petroleum Industry CEN/TC 12 Petroleum Industry			
Drilling, Subsea Underwater Rolf Nordaunet Norsk Industri (Vetco Gray)	Structures, Geotech, Marine, Pipeline Tore Sildnes Maritime Industry(DNV)	Process, Equipment, Piping Ragnar Mollan OLF(StatoilHydro) ISO/TC 67/SC 6	Electrical, Instr. Telecom, Temp.Eq. Gunnar Gundersen OLF(ConocoPhillips) IEC/CENELEC	Material Svein Anders Eriksson Authorities (Ptil)	HMS, Regularity, Civil, HVAC Jørn Olav Myhre Norsk Industri (Leirvik Module Technology)	ISO / CEN / IEC Supervision / Coordination Svein A. Eriksson, Auth. Gunhild Holtet Eie, OLF(StatoilHydro) Olav Inderberg, Norsk Industri (FMC) Stein Østerlie, Standards Norway ISO/TC 67&CEN/TC 12
ISO/TC 67/SC 3/4	ISO/TC 67/SC 2/7	EG L Piping Olav Nybråten OLF(StatoilHydro)	EG E Electrical TBN	ISO/TC 67/SC 5	ISO/TC 67/SC 6	
EG D Drilling Arild Thorsrud Rocksource	EG G Geotechnology Viggo Karlsen OLF(StatoilHydro)	EG P Process Kolbjørn Moen Norsk Ind.(Aker Solutions)	EG I Instrumentation Gunnar Gundersen OLF(ConocoPhillips)	EG M Material Geir Egil Eie OLF(StatoilHydro)	EG C Civil / Architect TBN	EG A Administration Jan G. Eriksson Standards Norway
EG U Subsea Per Ragnar Dahl OLF(StatoilHydro)	EG J Marine Torleif Sætrevik OLF(StatoilHydro)	EG R Mechanical Stig Hall Nybråten StatoilHydro	EG IM Metering Endre Jacobsen OLF(StatoilHydro)		EG H HVAC Stein Erik Uldalen OLF(StatoilHydro)	EG Z CCS Cost Coding System Rune hellem OLF(StatoilHydro)
EG UB Underwater Cato Hordnes OLF(StatoilHydro)	EG N Structural Inge Lotsberg Maritime Industry(DNV)	EG RL Lifting Jan Ketil Moberg OLF(ConocoPhillips)	EG T Telecom Jan Robert Moen OLF(StatoilHydro)		EG S HMS Ole Rekdal OLF(ENI Norge)	EG I SCD System Control Diagrams Idar Ingebriktsen Consultant
EG WF Well fluids Arne Torsvoll OLF(StatoilHydro)	EG Y Pipeline Erling Gjertveit OLF(StatoilHydro)	EG Z MC&P Halvdan Holter OLF(StatoilHydro)	EG Z TE Temporary Equipment Ove J Hana OLF(ConocoPhillips)		EG Z R Regularity & Criticality Henrik Kortner Maritime Industry(DNV)	EG Z TI Technical Info TBN
		Coordination with: K 48 Kraner og andre løfteinnretninger K 274 Trykkpåkjent utstyr	Coordination with: NEK (The Norwegian Electrotechnical Committee)	Coordination with: K 274 Trykkpåkjent utstyr K51 Maling		

Members "Expertgroup underwater operations" (EG_UB)

- **Cato Hordnes (chair)** Statoil
- **Bjørn Venn** ConocoPhillips
- **Bob Gardiner** Marathon
- **Trond Einar Hansen** Total
- **Arnfinn Anfindsen** Subsea 7
- **Mikal Sjur Lothe** Technip
- **Leif Johansen** Industri Energi
- **Kåre Segadal (coord)** NUI
- **Bjarne Sandvik (obs)** Petroleumstilsynet

- *@ start of U-103 development:*
- *Joar Gangenes* Acergy
- *Gunnar Bratli* ConocoPhillips
- *Bård A. Holand* Thelma
- *Martin Heer* Active Diver
- *Rudolf Brekken* Active Diver

Project group U-103

- **Operators for inshore facilities in Norway:**

- **Statoil:** Cato Hordnes
- **Shell:** Keith Stevenson
- **Exxon:** Martin Dane

- **Inshore dive entrepreneurs:**

- **NBU:** Øystein Reve

- **For the 3 offshore dive entrepr. :**

- **Agency:** Joar Gangenes

- **Workers' unions:**

- **Arbeidsmandsforbundet:**
Odd Haaheim (Sjøentreprenøren)
- **IndustriEnergi:** Leif Johansen

- **Dive schools:**

- **HIB-DU:** Finn Hansen
- **NYD:** Dag Wroldsen

- **Competence centr:**

- **NUI :** Kåre Segadal

- **Medical:**

- Centre for Diving
medicine (Haukeland) :
Marit Grønning

- **Authorities (obs):**

- **DLI:** Tor Fjelldal
- **PSA:** Bjarne Sandvik

Members "Projectgroup U-103" (EG_UB)

Reporting to Expert Group EG UB

- **Cato Hordnes (chair)** **Statoil**
- **Keith Stevenson** **Shell**
- **Martin Dane** **Exxon**
- **Øystein Reve** **NBU**
- **Joar Gangenes** **Acergy**
- **Leif Johansen** **Industri Energi**
- **Odd Haaheim** **Arbeidsmandsforbundet**
- **Finn Hansen** **HIB-DU**
- **Dag Wroldsen** **NYD**
- **Marit Grønning** **Centre for Diving medicine**
- **Kåre Segadal (coord)** **NUI**
- **Tor Fjellidal** **Directorate Labour Inspection**
- **Bjarne Sandvik (obs)** **PSA**

Progress

- June 2009 Kick-off (Statoil TR 1042)
- March 2010 Draft finished by Project Group
- April 2010 Approved by EG, to SN for editing
- June 2010 Public enquiry
- Nov 2010 Publication in English language
- May 2011 Publication in Norwegian language

Quick production due to

- a good basis (Statoil TR1042)
- dedicated and positive Project and Expert Group participants
- sticking to the NORSOK principles of Consensus and “Good enough is good enough”

”Points of interest”

- TUP (“Transfer Under Pressure”)
 - Qualification requirements
- Qualification requirements for supervisor
 - Reference to NORSOK U-100

Other NORSOK Standards

EG UB

- [U-100N:2009](#) Bemannede undervannsoperasjoner (Utgave 1, juli 2009)
- [U-100:2009](#) Manned underwater operations (Edition 3, April 2009)
- [U-101:1999](#) Diving Respiratory Equipment (Rev. 1, Aug 1999)
- [U-101N:1999](#) Pusteutstyr for dykking (Rev. 1, Aug 1999)
- [U-102:2003](#) Remotely operated vehicle (ROV) services (Rev. 1, October 2003)

Thank you for your attention!

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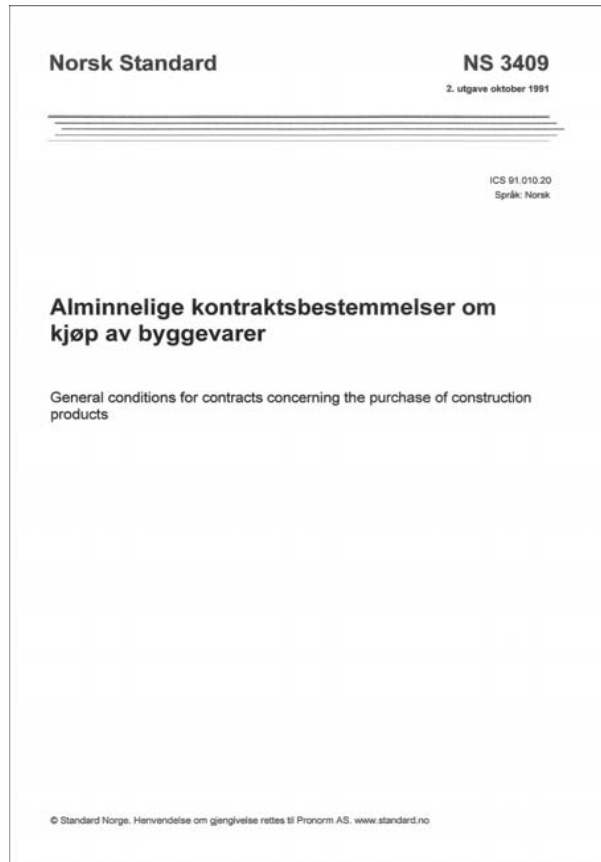
Standardization history goes on



”It should be one measure for wine throughout the Kingdom, one for beer and one for grain. And as it is with the volume, it should also be with the weight.”

Magna Carta 15. juni 1215

Standards are identified by:



Letters Digit

NS: national

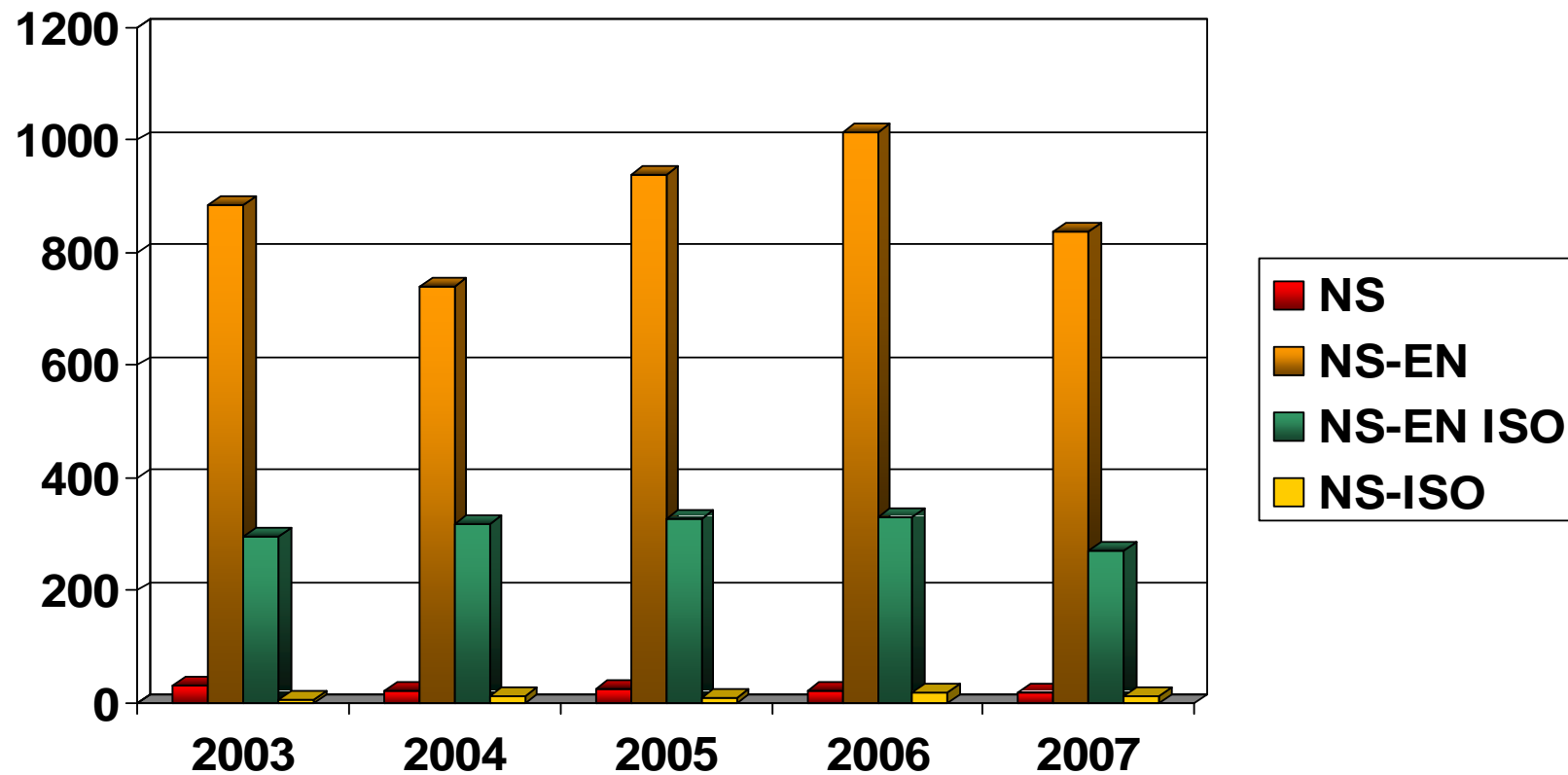
NORSOK: national

NS-EN: European

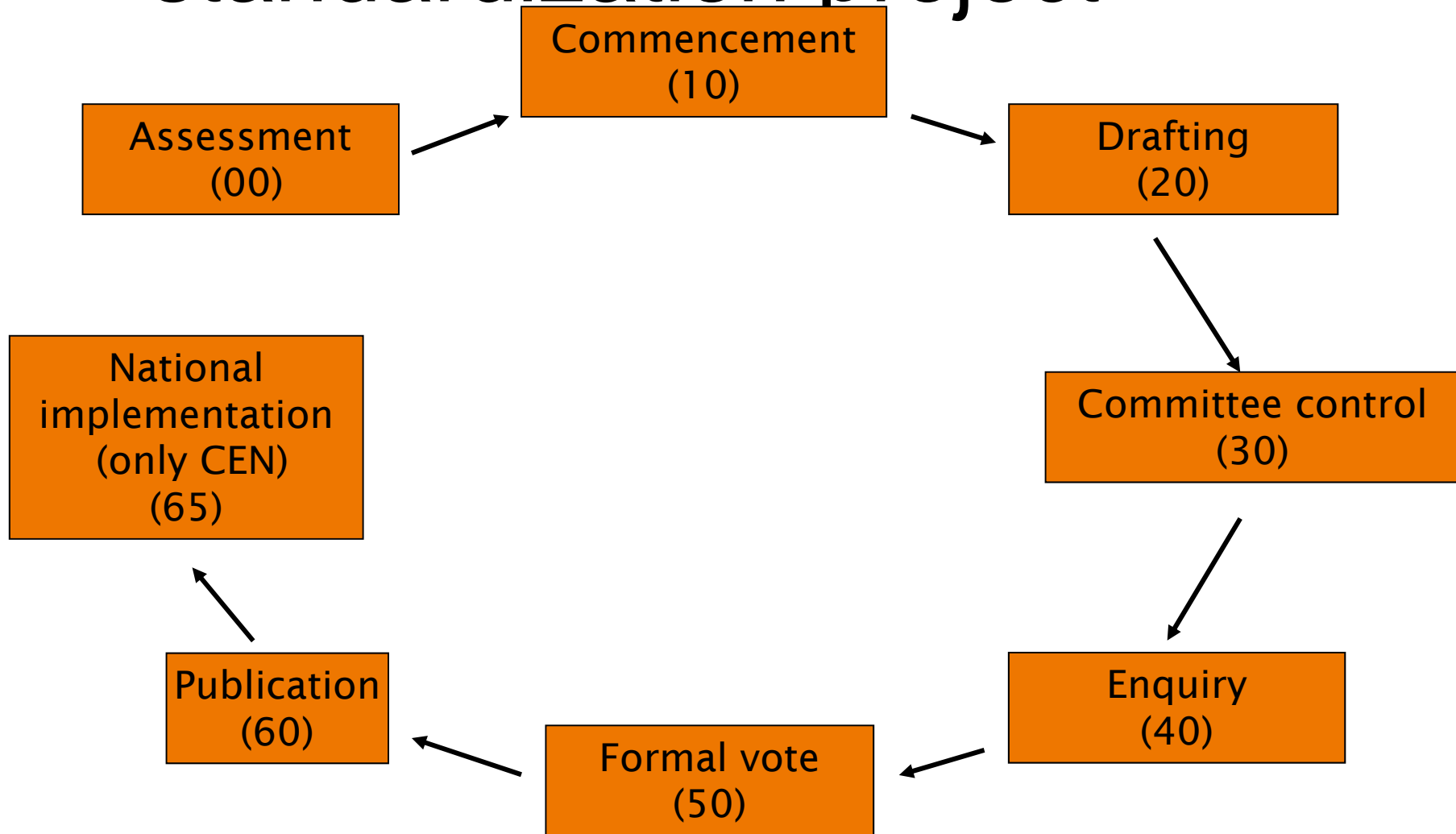
**NS-EN ISO: European
and international**

ISO: international

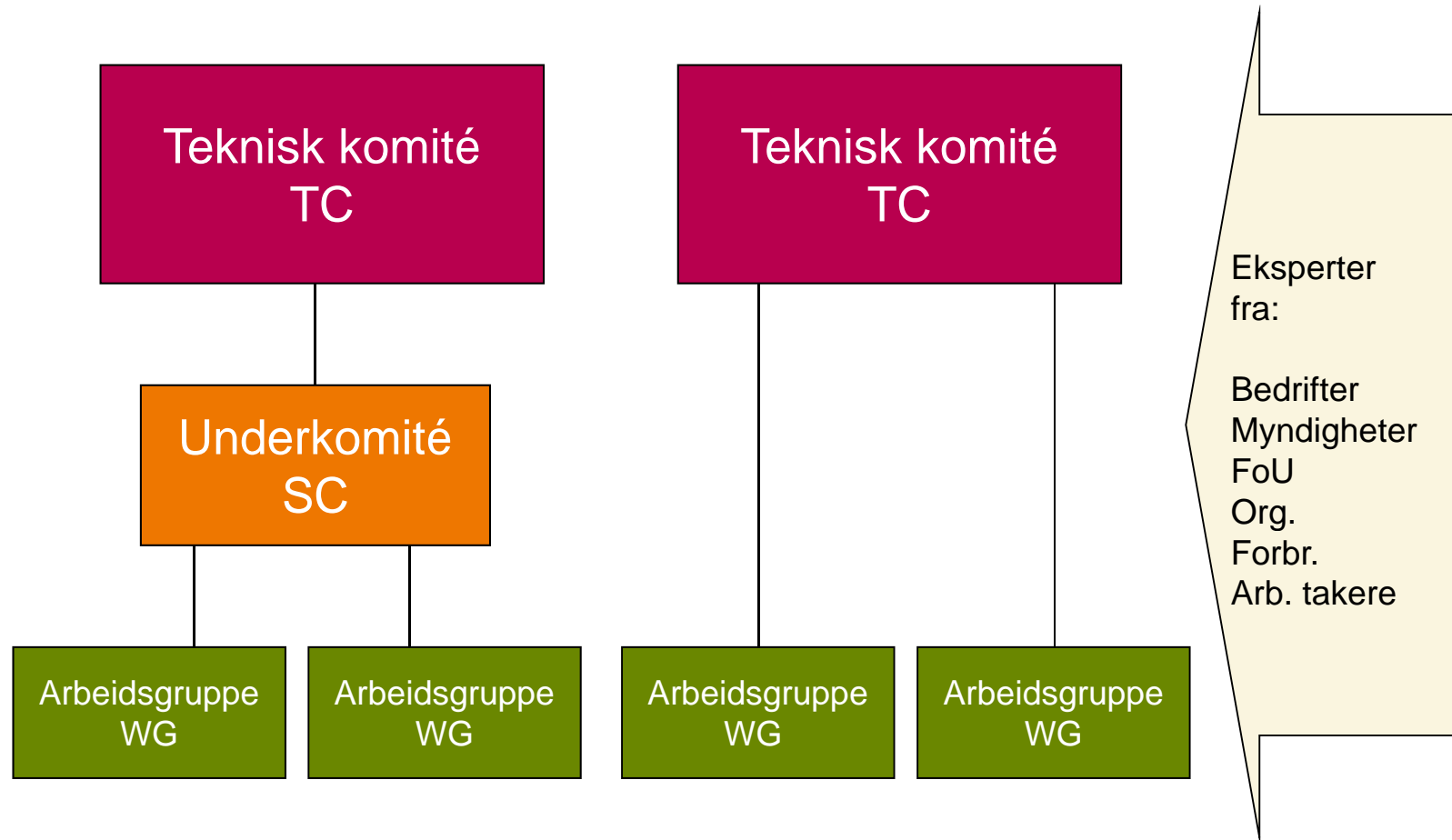
Adopted Norwegian Standards by source



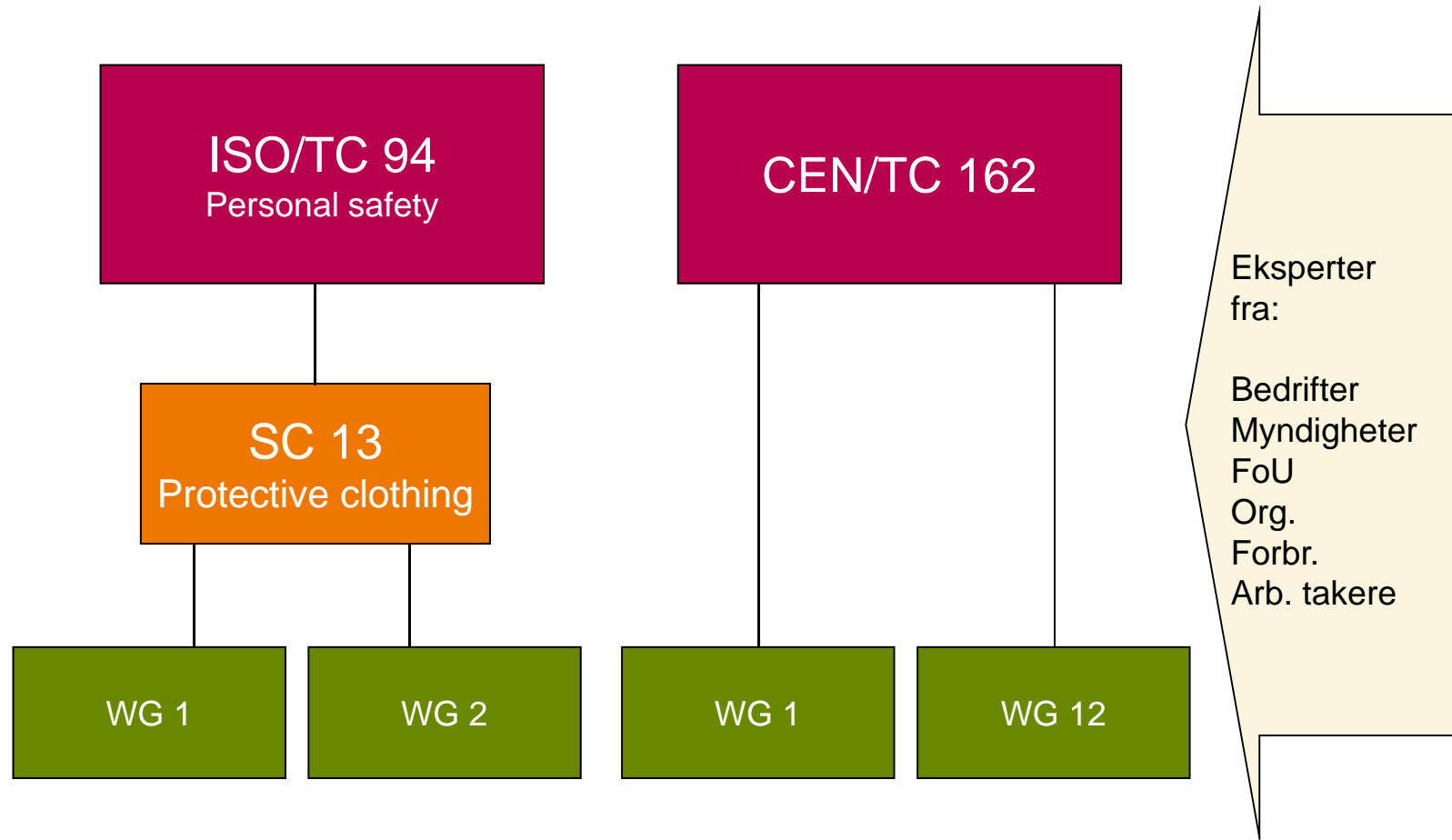
Phases in a standardization project



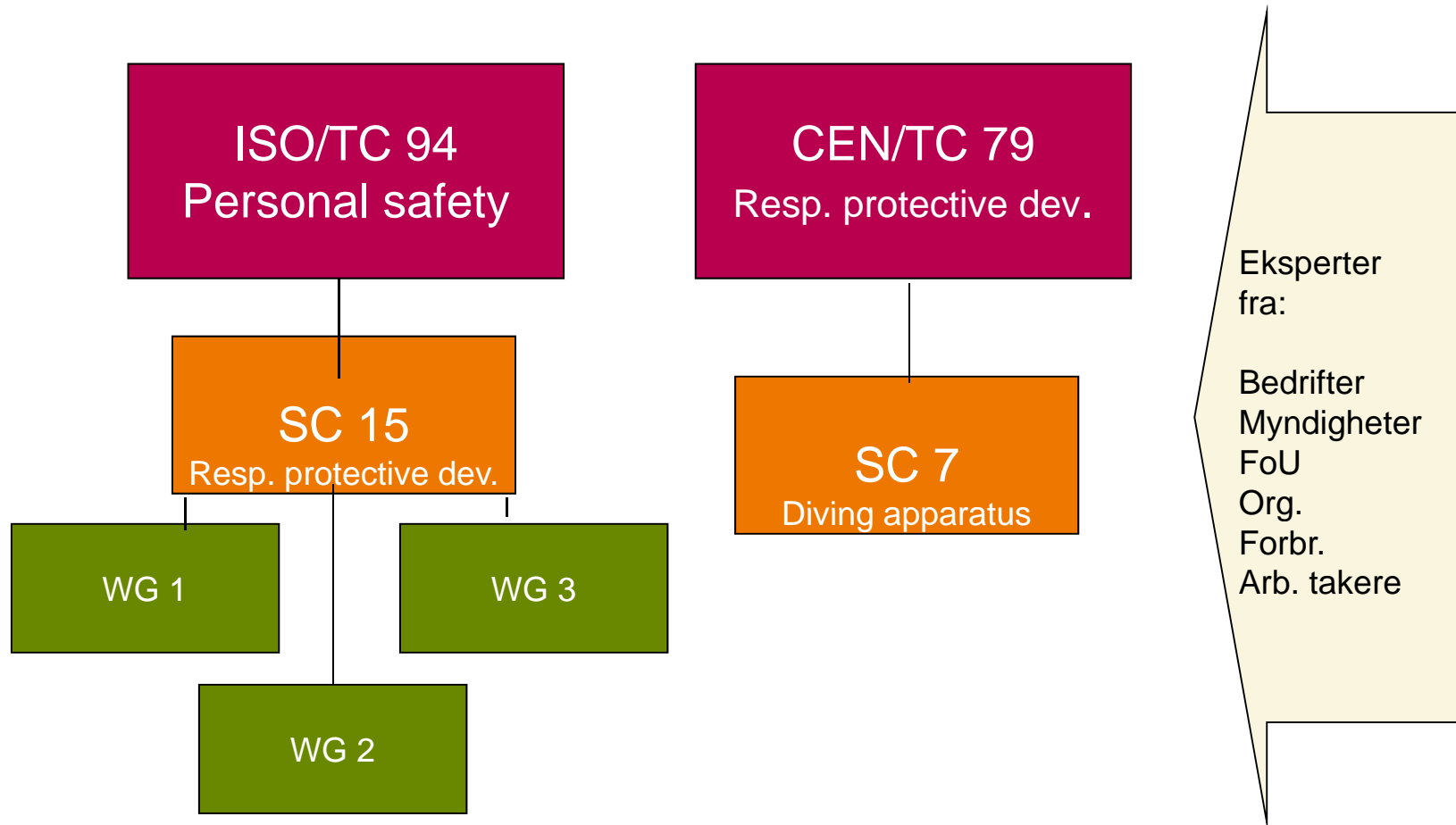
Organisering av arbeidet



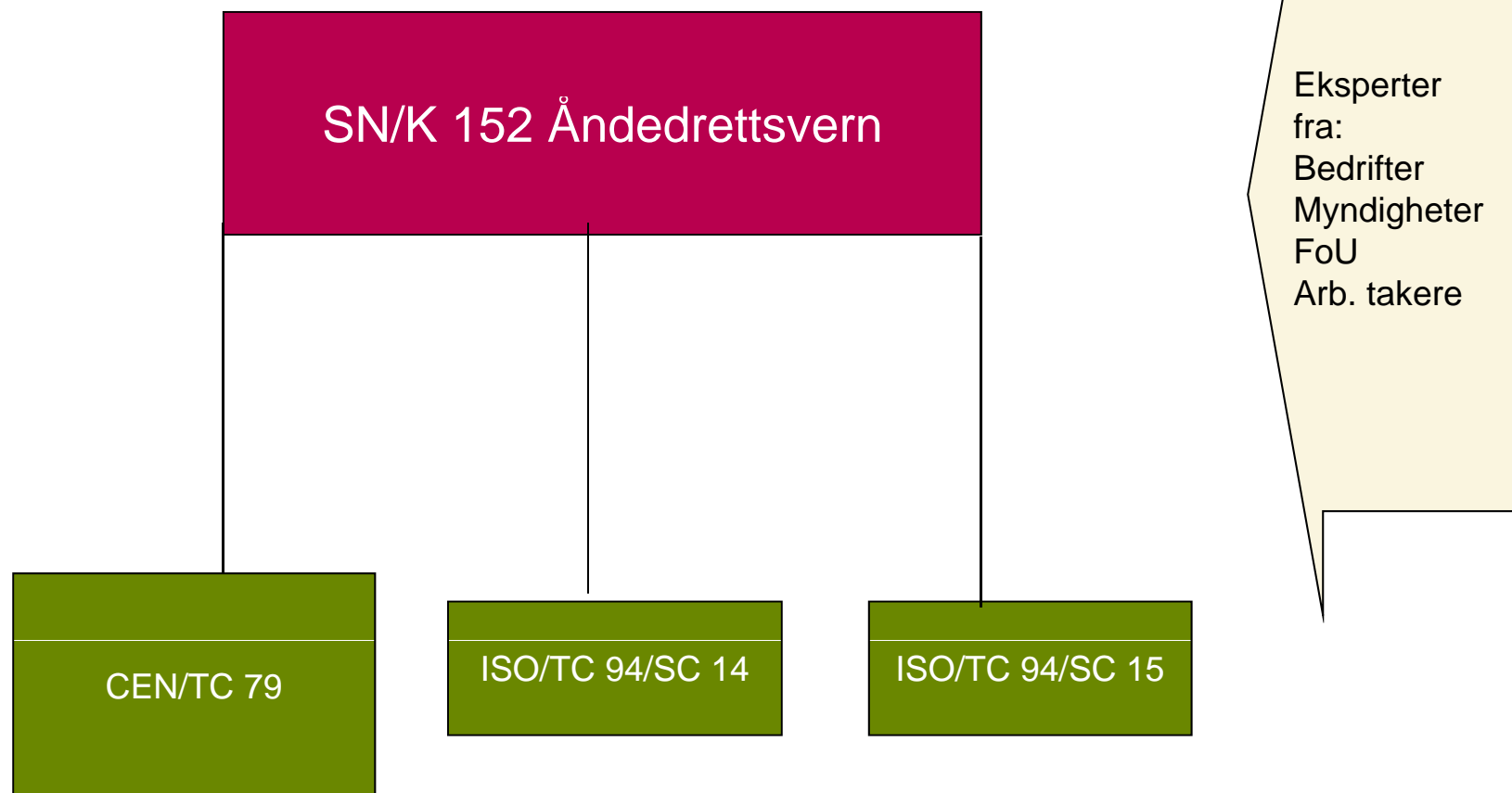
Organisering av arbeidet



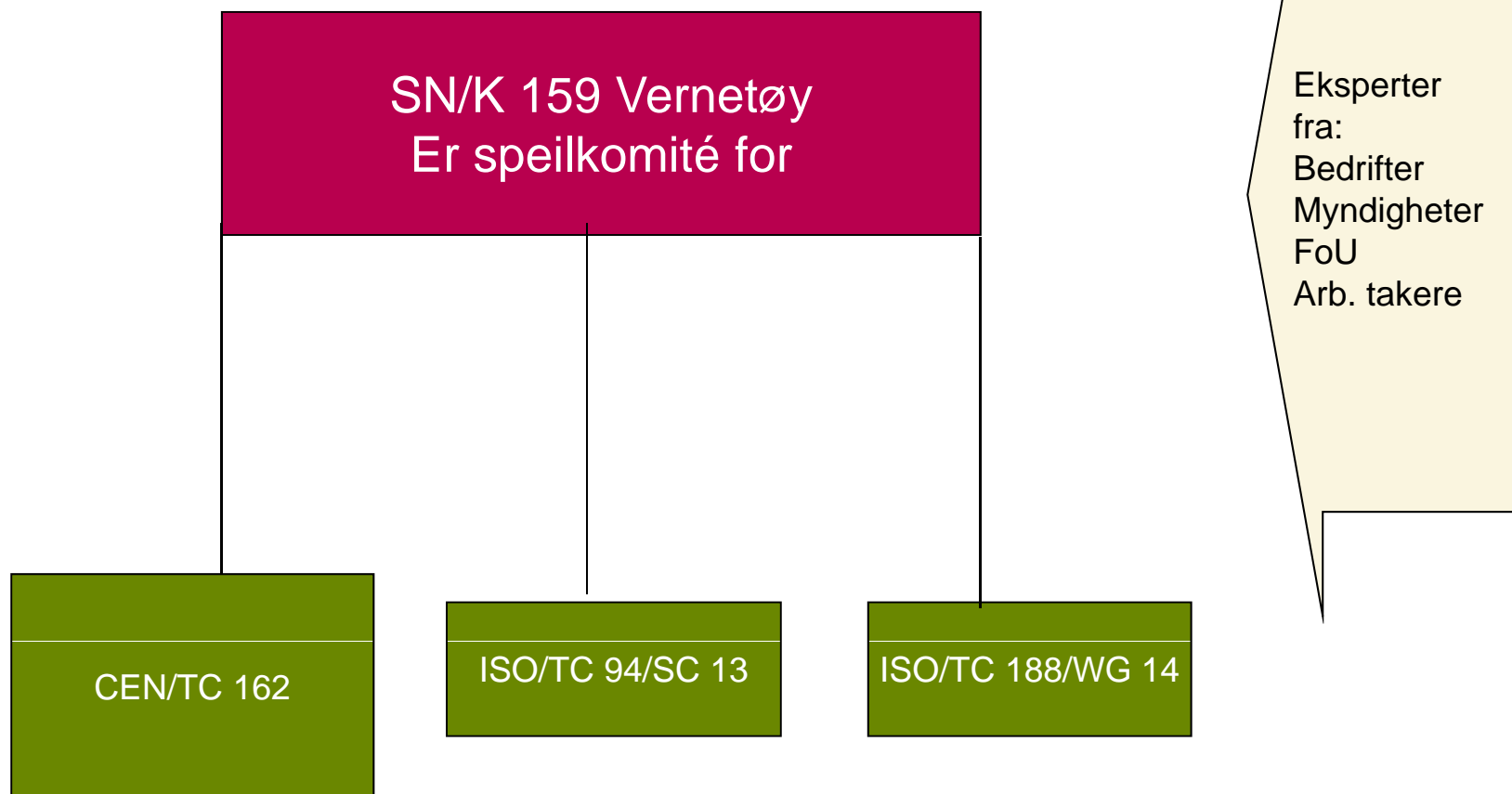
Organisering av arbeidet



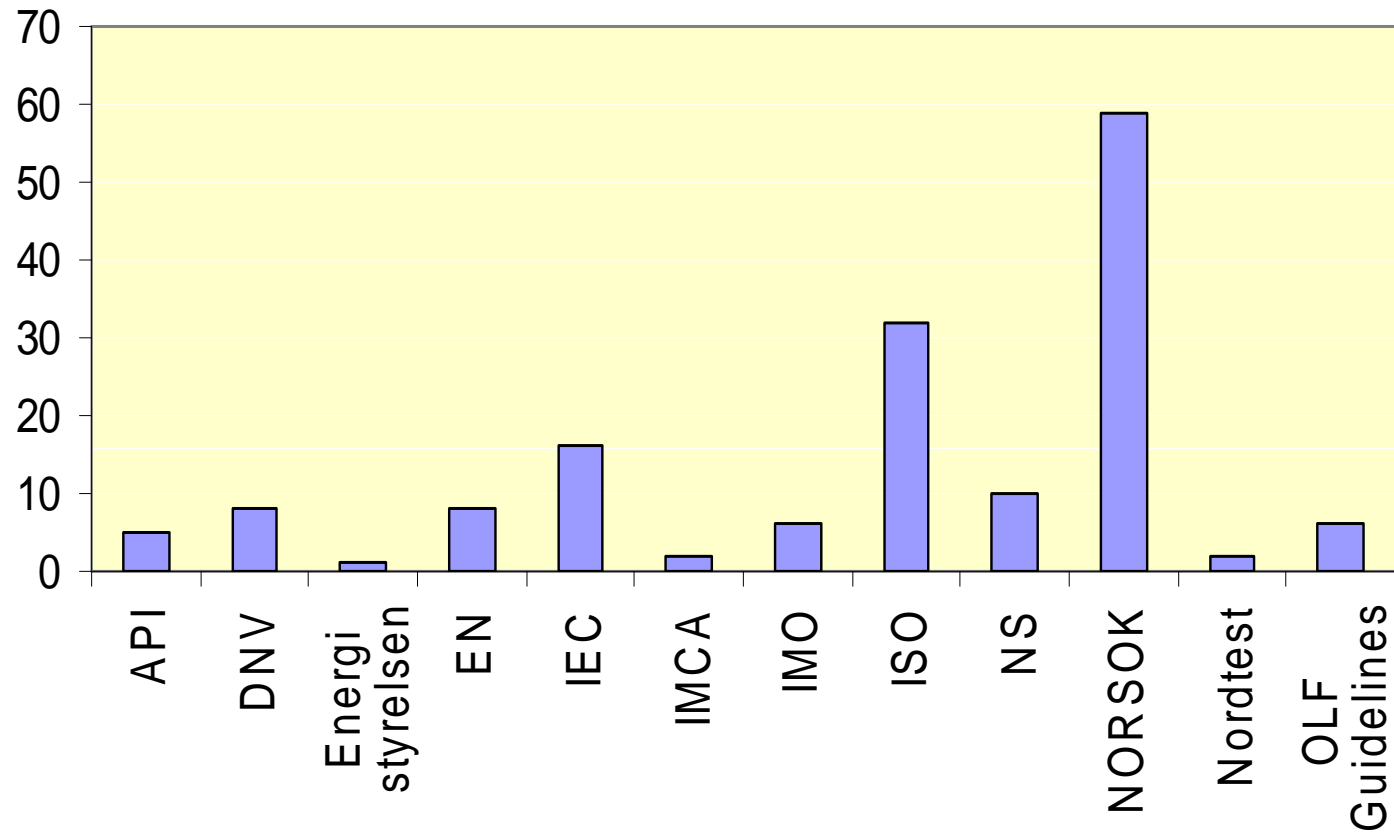
Organisering av arbeidet



Organisering av arbeidet

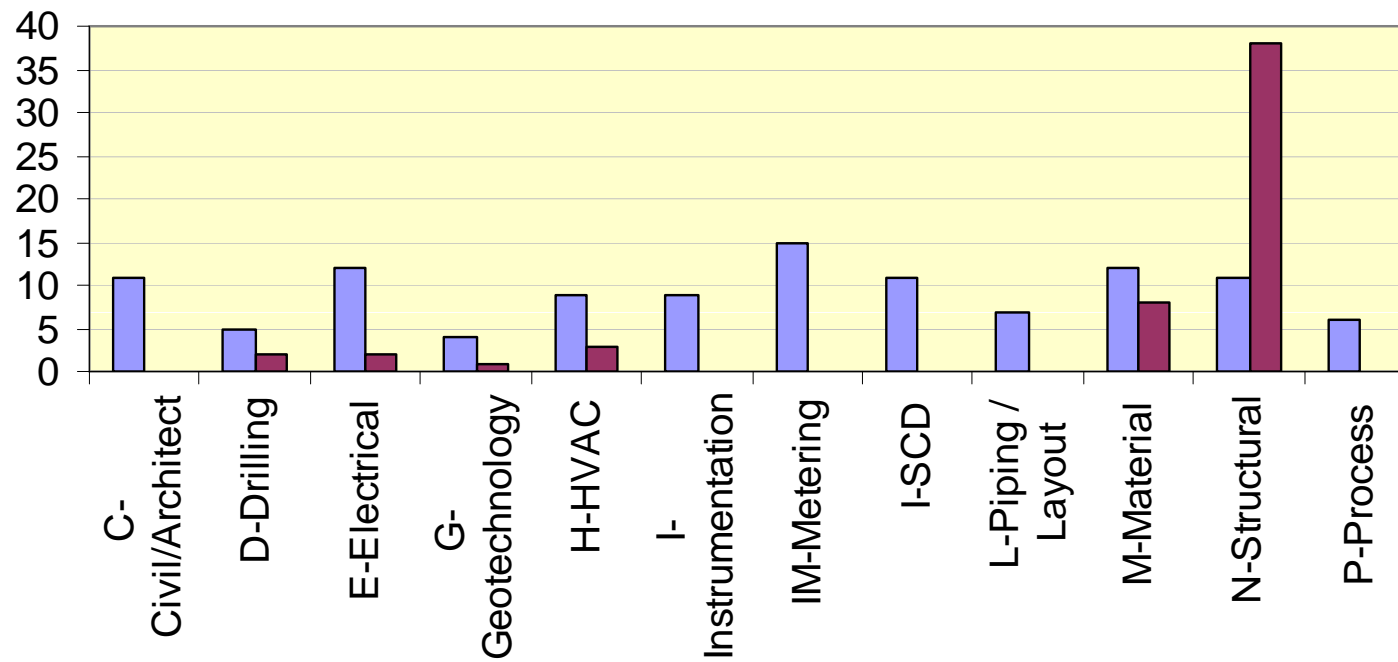


Governing documents referenced in Joint Regulations issued by PSA

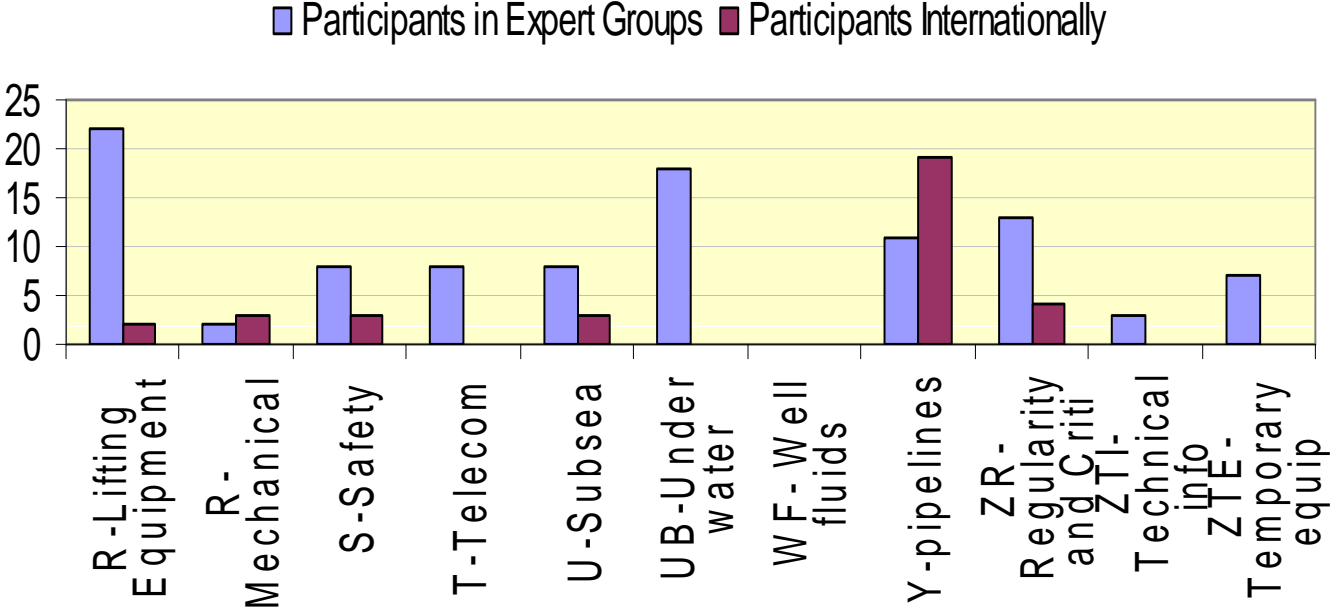


Participation in Petroleum Standardisation (1/2)

■ Participants in Expert Groups ■ Participants Internationally



Participation in Petroleum Standardisation (2/2)

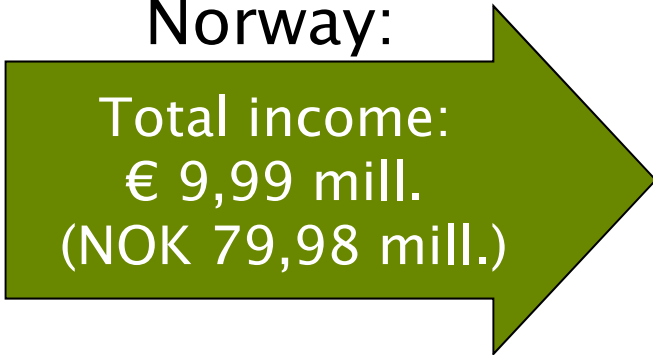


Costs and income 2007


(exchange rate € 1 = NOK 8)

Standards

Norway:

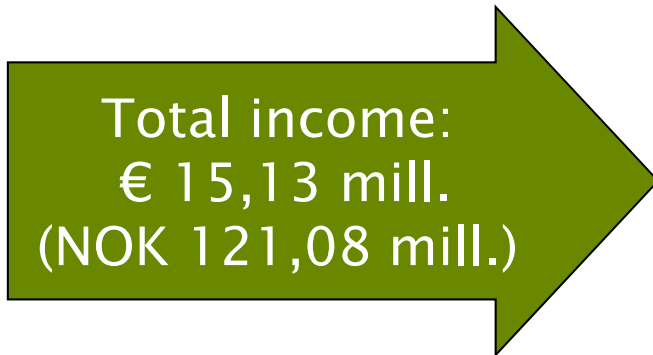


Total income:
€ 9,99 mill.
(NOK 79,98 mill.)




Total costs:
€ 9,89 mill.
(NOK 79,17 mill.)

Standards Norway consolidated (incl. Standards Online AS)



Total income:
€ 15,13 mill.
(NOK 121,08 mill.)



Total costs:
€ 13,13 mill.
(NOK 105,09 mill.)

Division of income 2007

(in mill. NOK)

