



Shell Global Solutions

International Standards Workshop

15-16 February 2007, Bucharest, Romania

Adoption of International Standards in Shell

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IFAN President, and
Shell Standards Manager
Shell Global Solutions International B.V.**



Introduction

- **Who needs standards? The world needs standards. Shell uses standards.**
- **By way of example, I will describe Shell's technical standards needs, and what Shell and our industry sector "the petroleum, petrochemical and natural gas industry" are doing about this. I can speak from our experience.**
- **Shell is an international company, trading in an international industry, using international (and national) suppliers under many different regulatory regimes. For our projects and operations, Shell prefers to use International Standards (ISO, IEC, ITU), and is actively supporting this.**
- **The principles are the same whichever standards system is to be used.**



ISO/TC67 Vision



Global
Standards Used
Locally
Worldwide

Company Standardization Management

Standards Steering Committee: E&P, refining, distribution, chemicals

Transparent standards structure: policy

Internal standards: provision of standards (DEPs);
materials standards catalogue (MESOC)

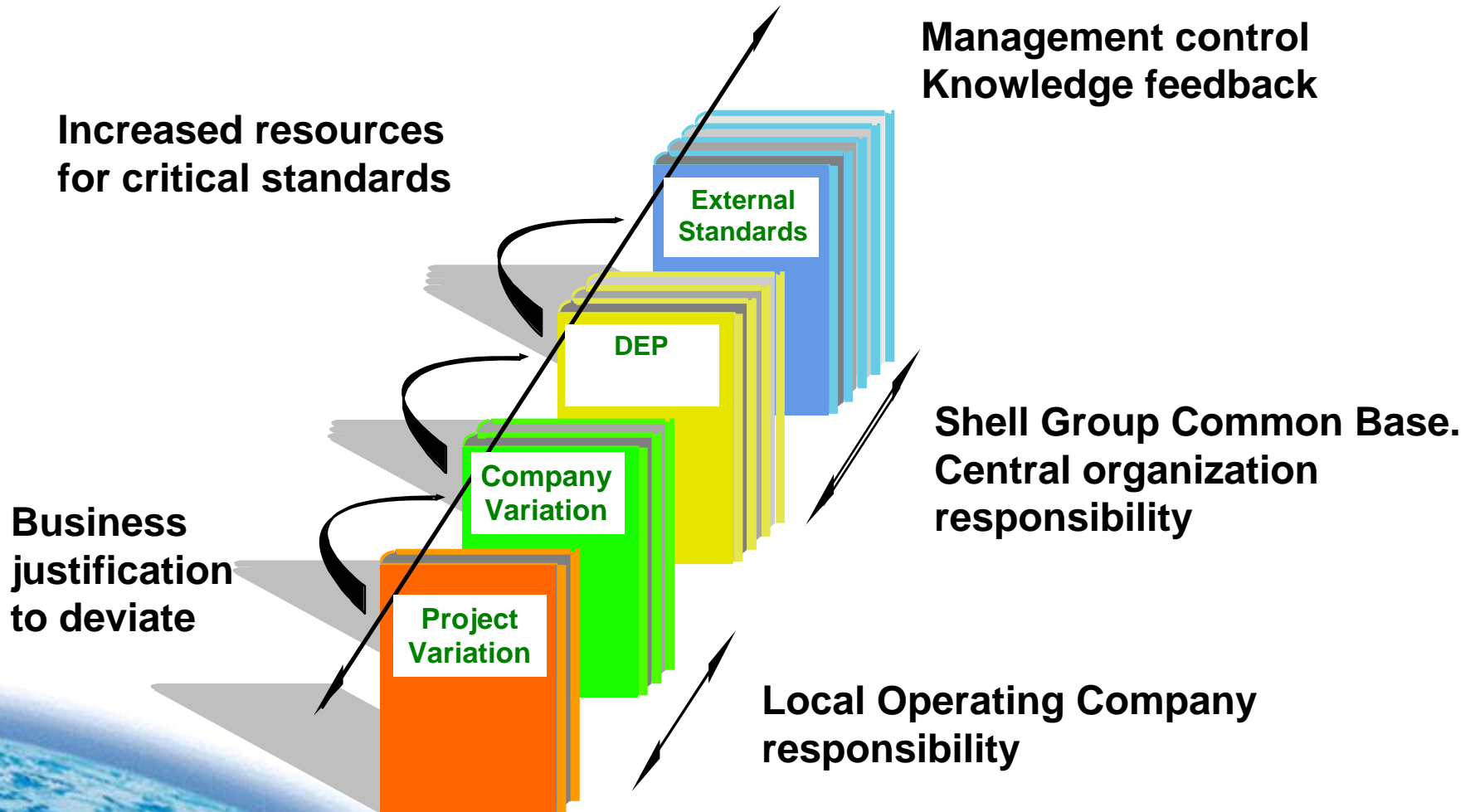
External standards: input to external standards

Variety control: type restriction; vendor selection

Information technology: provision of internal and external standards;
CD-ROMs and company website



Shell's Transparent Standards Structure



Shell Standardization Policy



- 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

Benefits are maximized when all companies use the same common industry standards

TECHNICAL SPECIFICATION

**CENTRIFUGAL PUMPS (AMENDMENTS/SUPPLEMENTS
TO ISO 13709)**

DEP 31.29.02.30-Gen.

May 2004

DESIGN AND ENGINEERING PRACTICE



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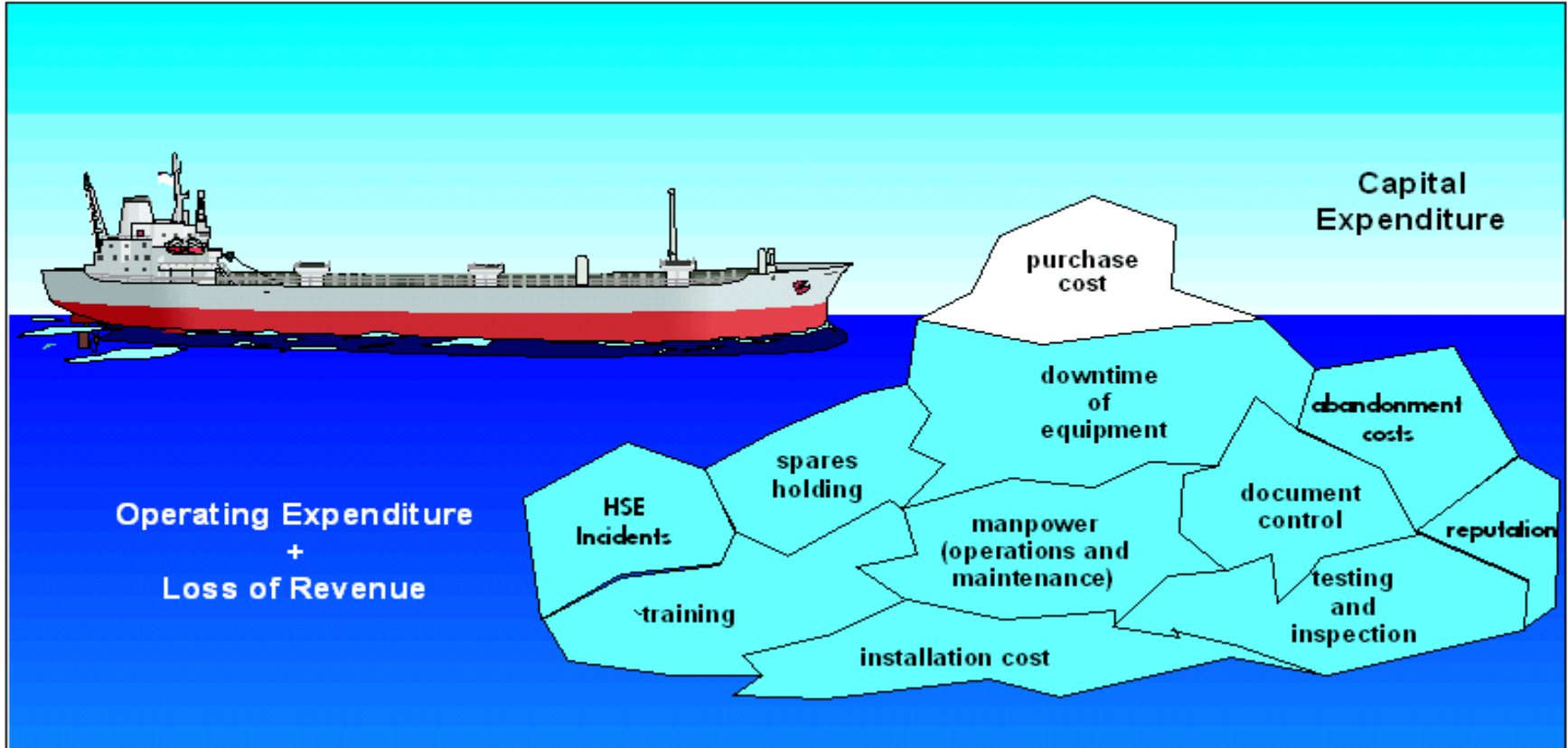
TABLE OF CONTENTS

PART I	INTRODUCTION	4
1.1	SCOPE	4
1.2	DISTRIBUTION, APPLICABILITY AND REGULATORY CONSIDERATIONS	4
1.3	DEFINITIONS	4
1.4	CROSS-REFERENCES	5
1.5	SUMMARY OF MAIN CHANGES SINCE PREVIOUS EDITION	5
1.6	COMMENTS ON THIS DEP	5
PART II	PUMPS FOR NON-ESSENTIAL SERVICE AND SPARED PUMPS FOR ESSENTIAL SERVICE (AMENDMENTS/SUPPLEMENTS TO ISO 13709)	6
1.	SCOPE	6
3.	DEFINITION OF TERMS	6
4.	CLASSIFICATION AND DESIGNATION	7
5.	BASIC DESIGN	8
6.	ACCESSORIES	13
7.	INSPECTION, TESTING AND PREPARATION FOR SHIPMENT	15
8.	SPECIFIC PUMP TYPES	20
PART III	PUMPS FOR VITAL SERVICE AND UNSPARED PUMPS FOR ESSENTIAL SERVICE (AMENDMENTS/SUPPLEMENTS TO ISO 13709)	23
1.	SCOPE	23
5.	BASIC DESIGN	23
6.	ACCESSORIES	24
7.	INSPECTION, TESTING AND PREPARATION FOR SHIPMENT	25
8.	SPECIFIC PUMP TYPES	26
9.	VENDOR DATA	27
PART IV	REFERENCES	28

APPENDICES

APPENDIX 1	MATERIALS SELECTION	31
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Total Cost of Ownership



Company benefits from standards

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 (WTO)

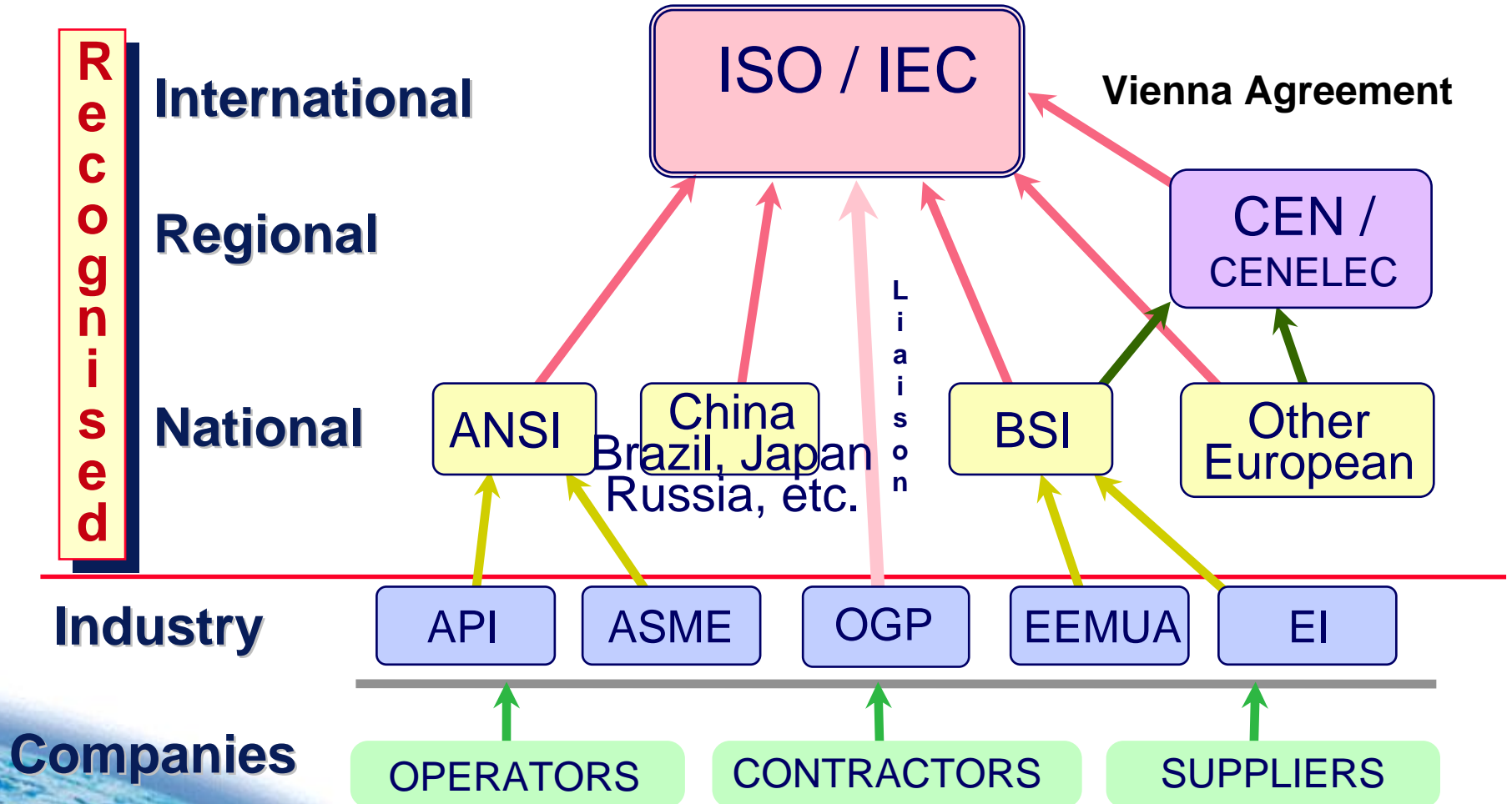
Support Legislation where linked

- Safety and Environmental Regulations (e.g. Process Safety Management, US)
- Procurement Legislation (e.g. European Directives)
- Essential Requirements (e.g. 'New Approach' European Directives)

IPA benchmark statistics report that using a coherent standards system saves projects:

5 % on Capex and 13 % on schedule

Standardization Bodies - Relationships



ISO/TC67 statements

Mission:

To create value-added standards for the oil and natural gas industry

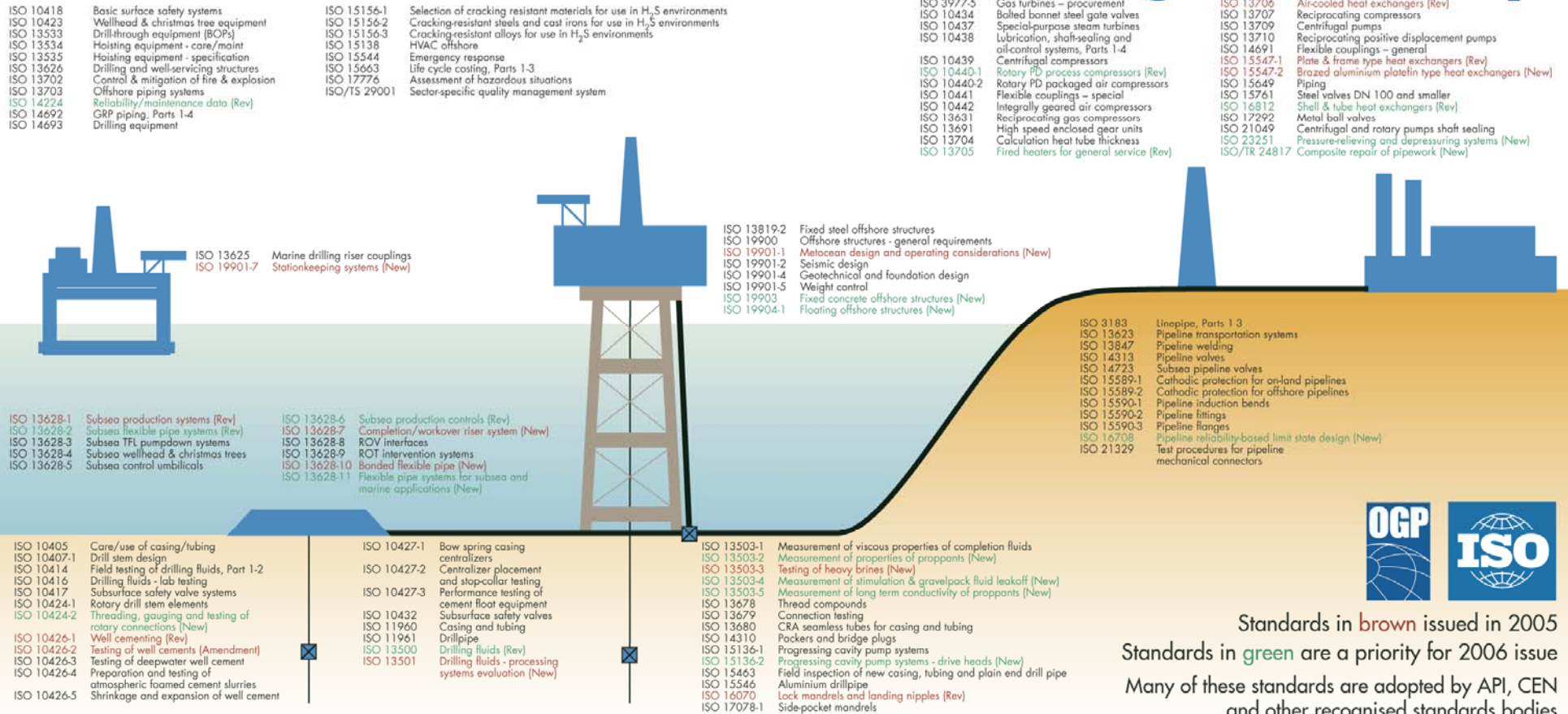
Vision:

Global standards used locally worldwide

Goals:

- Prepare standards required by this industry
- Prepare standards that could be adopted worldwide by bodies such as API and CEN
- Publish standards that enable companies to minimize their specifications
- Deliver standards to the target dates on the agreed work programme

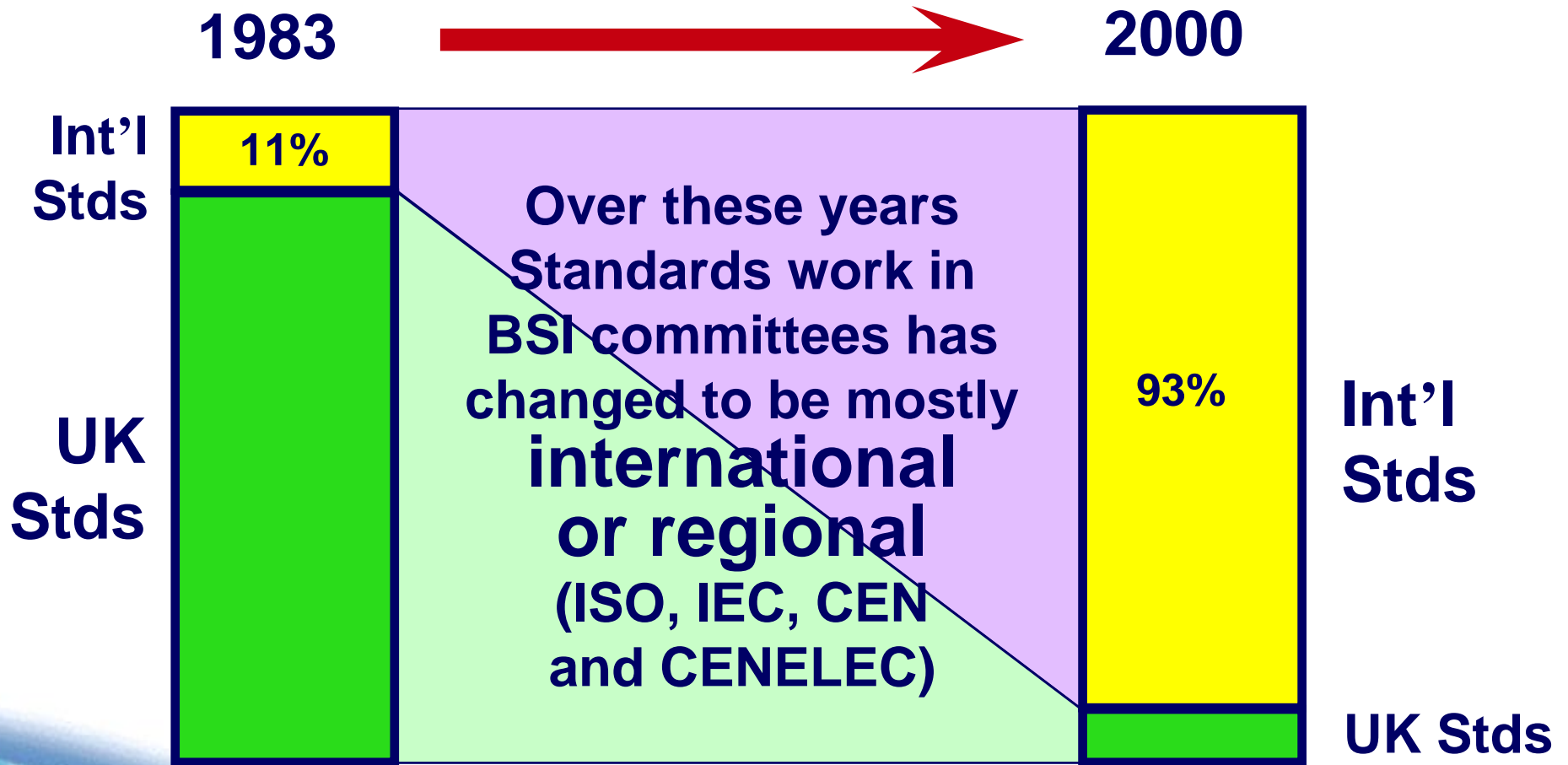
ISO Standards for use in the oil & gas industry



Standards in **brown** issued in 2005
Standards in **green** are a priority for 2006 issue
Many of these standards are adopted by API, CEN and other recognised standards bodies

- ISO TC67 has published 125 standards.
- API has adopted 50 of these as joint API / ISO standards.
- CEN has adopted 102 of these as joint European EN ISO standards.
- China has adopted 18 of these as Chinese national standards.
- Kazakhstan has adopted 54 of these as Kazakhstan national standards.

Pattern of change - Work in BSI



Note: Typical for all European Standards Bodies

Global standards used locally worldwide

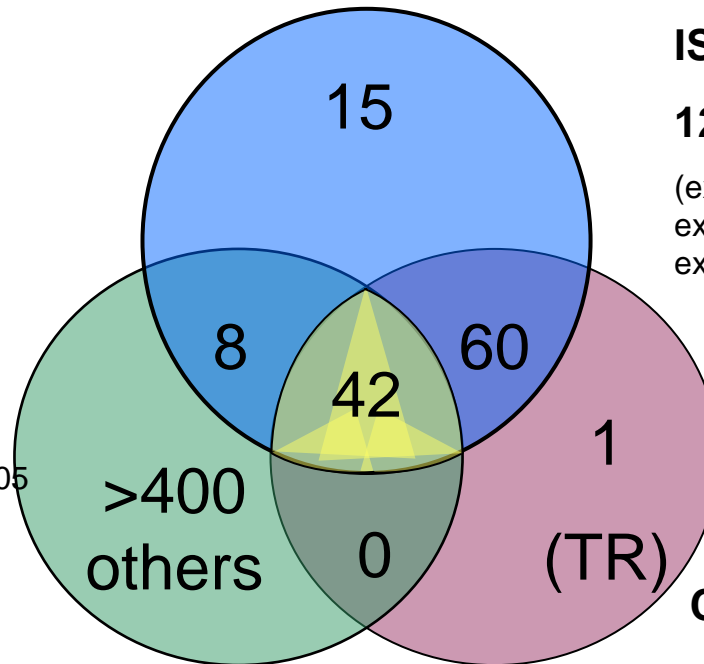
ISO-API-CEN

API

Upstream & Refining

50 cobranded published;

(excl. NACE MR0175/ISO 15156;
excl API Spec 9A/ISO 10425 from ISO/TC105
excl ISO 10497 from ISO/TC 153;
Excl 4 MPMS adoptions from ISO/TC28)



ISO/TC67

125 published

(excl. ISO 10425 from ISO/TC105;
excl ISO 10497 from ISO/TC 153;
excl. so-called “fast-track” standards)

CEN/TC12

103 published

(incl. EN ISO 10434, EN ISO 15761 and
EN ISO 17292 from CEN/TC69; and incl.
TR for use of ASME B31.1)

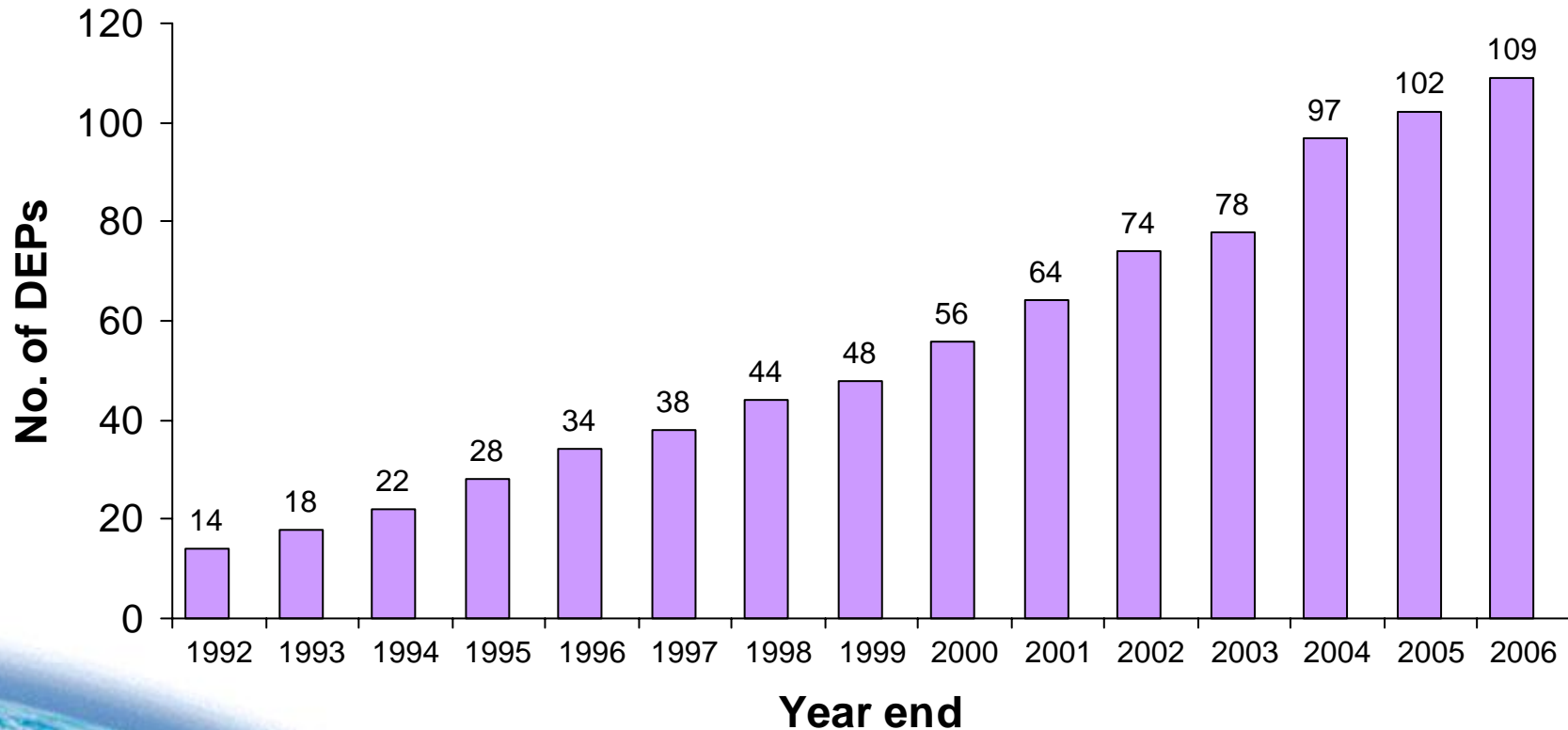
Note: 32 of the other >400 API Standards are
linked with 35 of the other 75 ISO/TC67 Standards



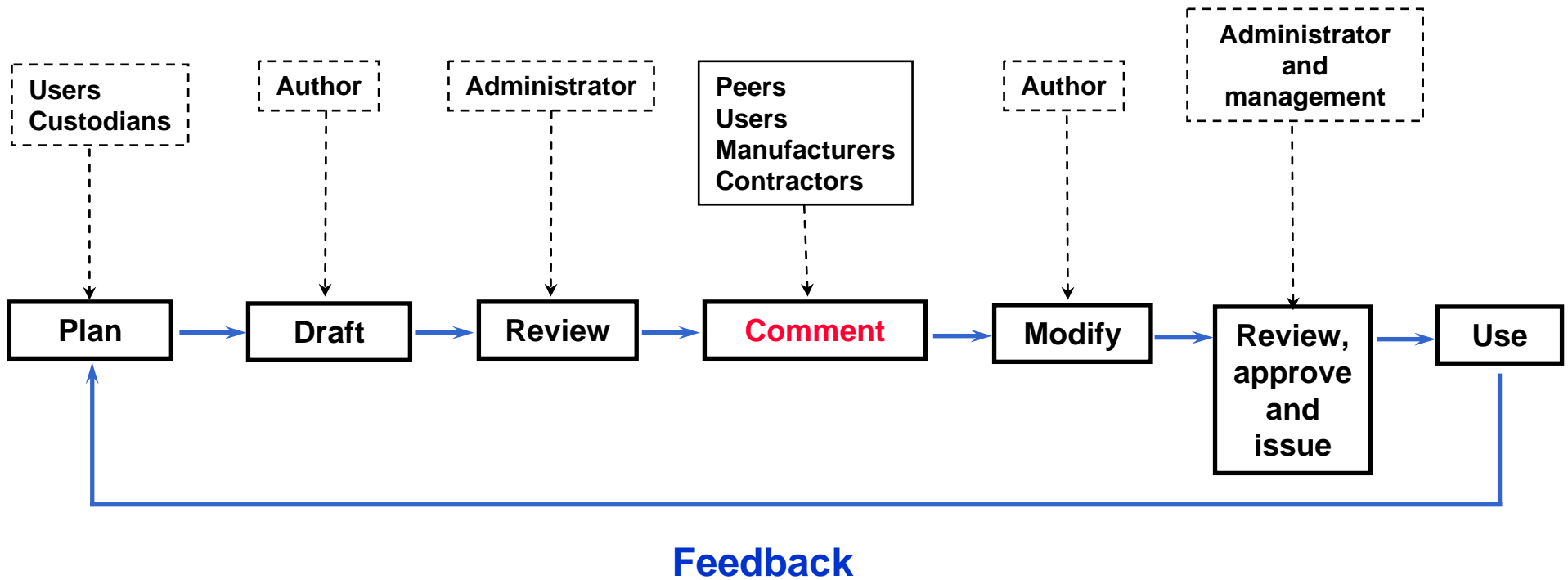
Trend towards transparency - Benefit of external standards efforts

(Total number of DEPs = 320)

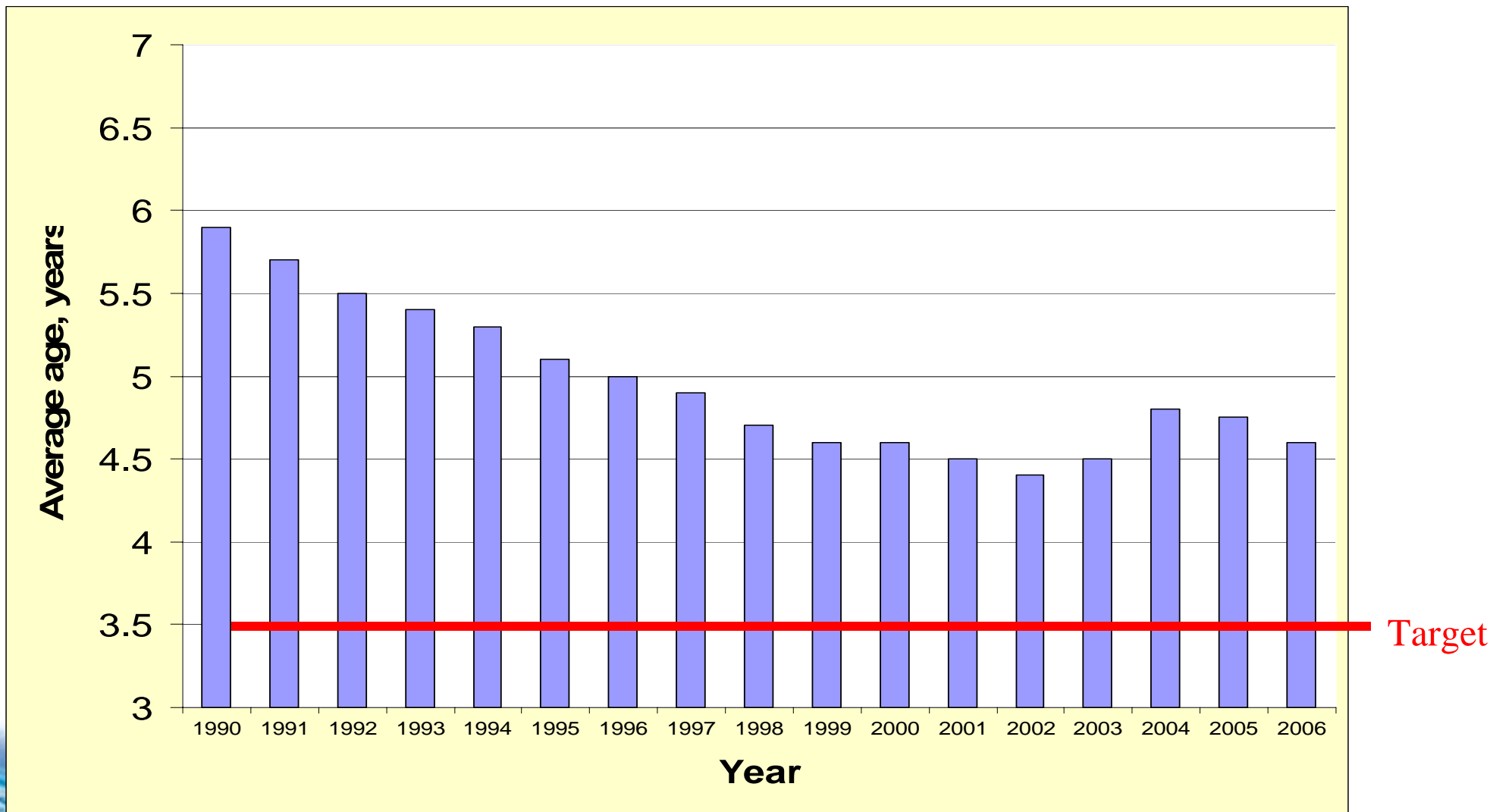
Number of DEPs based on external standards



DEP making process



DEP average age



DEP & MESC system contents

Subject Category	No of DEPs
Miscellaneous Engineering Subjects and Indices	26
Mechanical Engineering	
General	13
General equipment/noise/safety relief systems	11
Boilers/furnaces	4
Heat exchangers	7
Vessels/columns/reactors	10
Rotating equipment	28
Piping and pipelines	44
Construction materials	4
Welding	3
Maintenance and inspection	6
Offshore applications	17
Instrument Engineering and Telecommunications	34
Electrical Engineering	20
Civil Engineering	21
Surface Protection	23
Safety and fire fighting	8
Drilling and production	24
Total number of DEPs	303

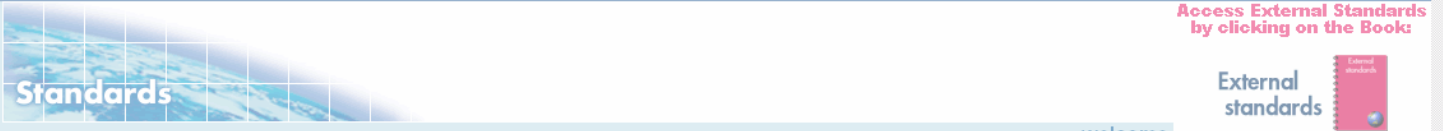


MESC covers most of the piping class items, such as pipes, valves, flanges, fittings, gaskets, level gauges, meterruns, Y-type strainers, thermowells, etc.

Jump to: Home

- Standards
 - About us
 - SSSC
 - External standards
 - Internal standards
 - OU standards
 - Forums
 - Useful links
 - Contact us
 - Site map

Legal disclaimer



welcome

Access External Standards by clicking on the Book:



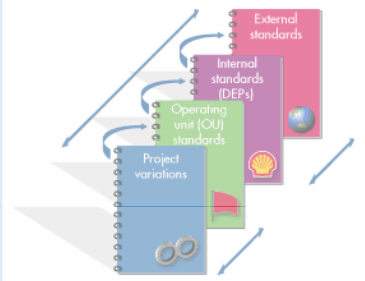
Access the DEPs by clicking on the Book:



Global standards used locally worldwide

Within the Shell Group we use standards for a variety of reasons, including enhancing technical integrity, underpinning HSE policy, transferring knowledge, complying with legislation and, most importantly, in order to conduct our business efficiently and cost effectively.

There is a Group guideline for realising the benefits of applying standards to our operations. This includes:



- Maximising the use of common industry standards;
- Minimising the need for additional company requirements;
- Ensuring that any variations are justified;
- Ensuring continuous improvement of applied standards;
- Influencing external standards bodies.

Shell's application of standards worldwide

The transparent standards structure used within the Shell Group is illustrated above. This structure reflects the Group's decentralised organisation and recognises that OU variations and project variations to DEPs both exist and are required.

The main elements of the transparent structure for a particular standard are:

- The **external standard** (where available);
- The **DEPs**, which supplement the external standards in order to reflect the minimum, additional Group requirements;
- **OU variations**, which supplement the DEPs to reflect the regional and local requirements of that OU;
- **Project variations**, which supplement the DEPs (whether amended or not by the OU variation) in order to reflect the specific requirements of any project.



Abbreviations

This presentation makes use of many abbreviations in order to illustrate the various issues.

These include:

ISO CS	ISO Central Secretariat	http://www.iso.ch
IEC CS	IEC Central Secretariat	http://www.iec.ch
ISO/TC67	ISO Technical Committee 67	http://www.tc67.net
API	American Petroleum Institute	http://www.api.org
ANSI	American National Standards Institute	http://www.ansi.org
CEN	European Standards Organization	http://www.cenorm.be
OGP	International Association of Oil and Gas Producers	http://www.ogp.org.uk
Europaia	European Petroleum Industry Association	http://www.europia.com
DEP	Shell Group Design and Engineering Practice	http://www.shell.com
MESC	Shell Materials Equipment Standards and Code	http://www.shell.com

Conclusions

- Standards are a corporate asset, and not a corporate liability
 - Shell will maintain a standards system
 - Shell needs and uses international standards
 - Shell participates in developing international standards
-
- Organizations should develop a standards plan to meet their needs (Identify key standards; manage use of these)



Thank You

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Back-up

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Shell and Diversity

- **Shell is Anglo/Dutch in origins (100 year history)**
- **Shell operates in 145 countries in 6 continents**
- **In our offices in The Hague there are 60 nationalities**
- **High degree of local business autonomy in operations**



Challenges facing the Oil and Gas Industries

Aging workforce

- Shared burden. Reduced in-house effort. Repository future generations

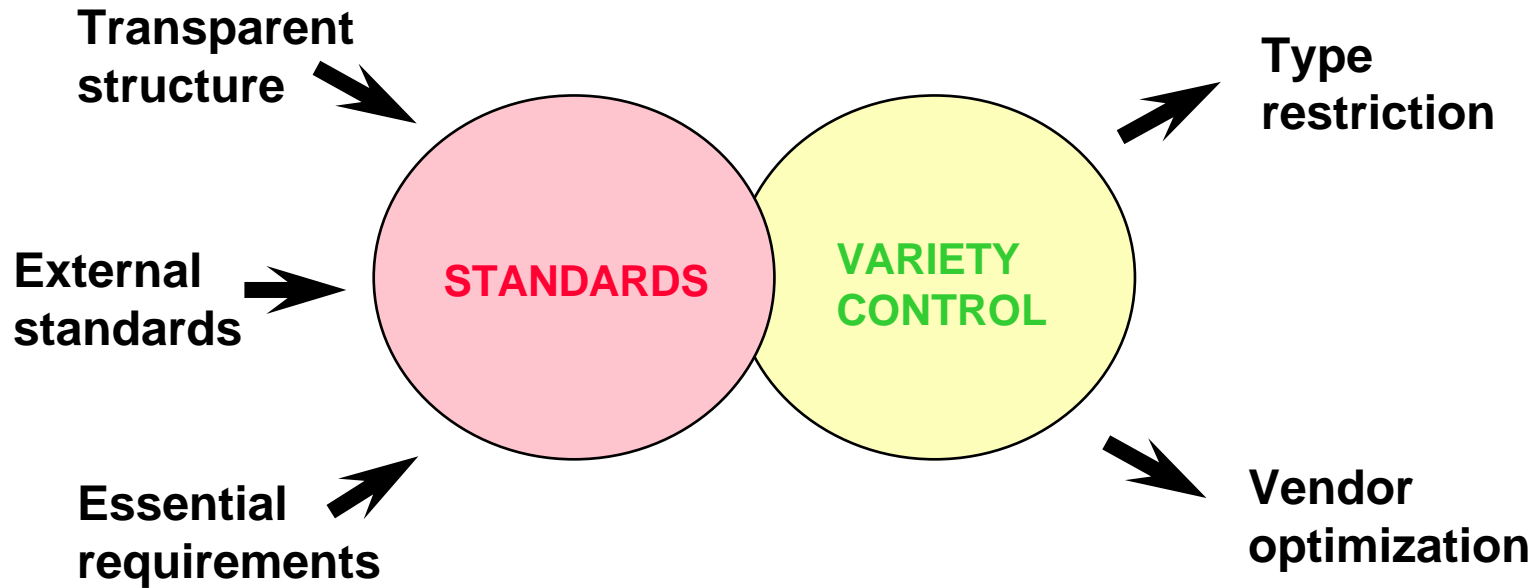
High project load

- Coherent set. Fit for legal use. Timesaving features. Acceptance and compliance. Feed back learning

Community stakeholder emancipation

- Provide cover for HSE. International Standards reduce risk of liability. Manage HSE; avoid “gold-plating” response

Standards + Variety Control = Standardization



Remark

A catalogue such as MESCC is a key enabler for standardization

Two standardization examples

30% price savings on electric cable, and 50% stock reduction.

30% price savings on valves, and 80% stock reduction.

STANDARDS ARE
A CORPORATE **ASSET**
NOT A CORPORATE
LIABILITY



INTERNATIONAL
STANDARD

ISO
13709

First edition
2003-07-01

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

*Pompes centrifuges pour les industries du pétrole, de la pétrochimie et
du gaz naturel*

**Centrifugal Pumps for Petroleum,
Petrochemical and Natural Gas
Industries**

**ANSI/API Standard 610
Tenth Edition, October 2004**

**ISO 13709: 2003, (Identical) Centrifugal pumps for
petroleum, petrochemical and natural gas industries**



**Helping You
Get The Job
Done Right.™**



Reference number
ISO 13709:2003(E)

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May 2004

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TABLE OF CONTENTS

PART I	INTRODUCTION	4
1.1	SCOPE	4
1.2	DISTRIBUTION, APPLICABILITY AND REGULATORY CONSIDERATIONS	4
1.3	DEFINITIONS	4
1.4	CROSS-REFERENCES	5
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PART II	PUMPS FOR NON-ESSENTIAL SERVICE AND SPARED PUMPS FOR ESSENTIAL SERVICE (AMENDMENTS/SUPPLEMENTS TO ISO 13709)	6
1.	SCOPE	6
3.	DEFINITION OF TERMS	6
4.	CLASSIFICATION AND DESIGNATION	7
5.	BASIC DESIGN	8
6.	ACCESSORIES	13
7.	INSPECTION, TESTING AND PREPARATION FOR SHIPMENT	15
8.	SPECIFIC PUMP TYPES	20
PART III	PUMPS FOR VITAL SERVICE AND UNSPARED PUMPS FOR ESSENTIAL SERVICE (AMENDMENTS/SUPPLEMENTS TO ISO 13709)	23
1.	SCOPE	23
5.	BASIC DESIGN	23
6.	ACCESSORIES	24
7.	INSPECTION, TESTING AND PREPARATION FOR SHIPMENT	25
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9.	VENDOR DATA	27
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APPENDICES

APPENDIX 1	MATERIALS SELECTION	31
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8.2.4.1.3 REPLACE THIS CLAUSE BY:

A lateral analysis of the pump shall be performed in accordance with Annex I, and assessed at design clearances and at three times specified wear ring and bushing clearances. Unless otherwise specified a shop verification of the unbalanced response analysis shall be performed.

ADD NEW CLAUSE:

8.2.4.1.4 The analysis report shall include sufficient dimensional and mass elastic data to perform an independent analysis. Any input models used shall also be included.

8.2.6 Lubrication

8.2.6.1 REPLACE THE FIRST SENTENCE OF THIS CLAUSE BY:

A pressure-lubrication system shall be furnished to supply oil at a suitable pressure to the pump bearings, the driver and any other driven equipment, including gears.

8.2.8 Preparation for shipment

8.2.8.3 REPLACE THIS CLAUSE BY:

If a spare rotor is purchased it shall be crated in a metal container in the vertical position for transportation and storage. The crating method shall be suitable for at least 4 years' storage.



Engineering Guides and General Specifications

11 GS-610 Centrifugal Pumps (amendments/supplements to DEP 31.29.02.30-Gen. (May 2004))

This General Specification is written as amendments and supplements to DEP 31.29.02.30-Gen. Sections of DEP 31.29.02.30-Gen. which are not amended shall remain valid as written.

Amendments/supplements to DEP 31.29.02.30-Gen.

PART I INTRODUCTION

1.1 SCOPE

Replace the sixth paragraph by:

This GS shall be used in conjunction with data sheets 11E610S1 to 11E610S3.

PART II PUMPS FOR NON-ESSENTIAL SERVICE AND SPARED PUMPS FOR ESSENTIAL SERVICE

5. BASIC DESIGN

5.1 General

5.1.16 Noise Control

5.1.16.1 Limits

Replace the first sentence by:

The Contractor shall comply with 24 GS-8 and thereby communicate to the Vendor the specified equipment noise limitations by using data sheet 24G8S1, which forms part of this requisition.

5.1.16.2 Information to be submitted with the tender

Replace this clause by:

The Vendor shall submit guaranteed sound power levels and sound pressure levels (including octave band spectrum) of the equipment, together with any other relevant information as requested in the data sheet 24G8S1.

5.8 Mechanical shaft seals

5.8.1 *Replace the first sentence by:*

All mechanical seals shall be in accordance with 11 GS-682.

5.12 Materials

5.12.1 General

5.12.1.1 *Replace this clause by:*

The materials of construction for pumps purchased on projects managed by the Projects Task Force shall be in accordance with the Materials Selection Report (MSR); if an MSR is not available the materials of construction shall be in accordance with Appendix 1 of DEP 31.29.02.30-Gen. and/or as specified by the materials and corrosion specialist assigned to the project.

6. ACCESSORIES

6.1 Drivers

6.1.1 *Replace this clause by:*

Electric motor drivers shall be in accordance with 15 GS-21, 15 GS-23 or 15 GS-26, as applicable.

6.1.9 *Replace this clause by:*

..., except that gears in services operating at absorbed power above 750 kW (1000 hp) shall be in accordance with 11 GS-613.

6.1.11 *Replace this clause by:*

Internal combustion engines shall comply with NFPA 37 if located in an area classified as Class 1 Division 1 or Class 1 Division 2.

6.4 Instrumentation

6.4.1 *Replace the last sentence by:*

If supplied, the gauges shall comply with 16 GS-459V or 11 GS-682.

7. INSPECTION, TESTING, AND PREPARATION FOR SHIPMENT

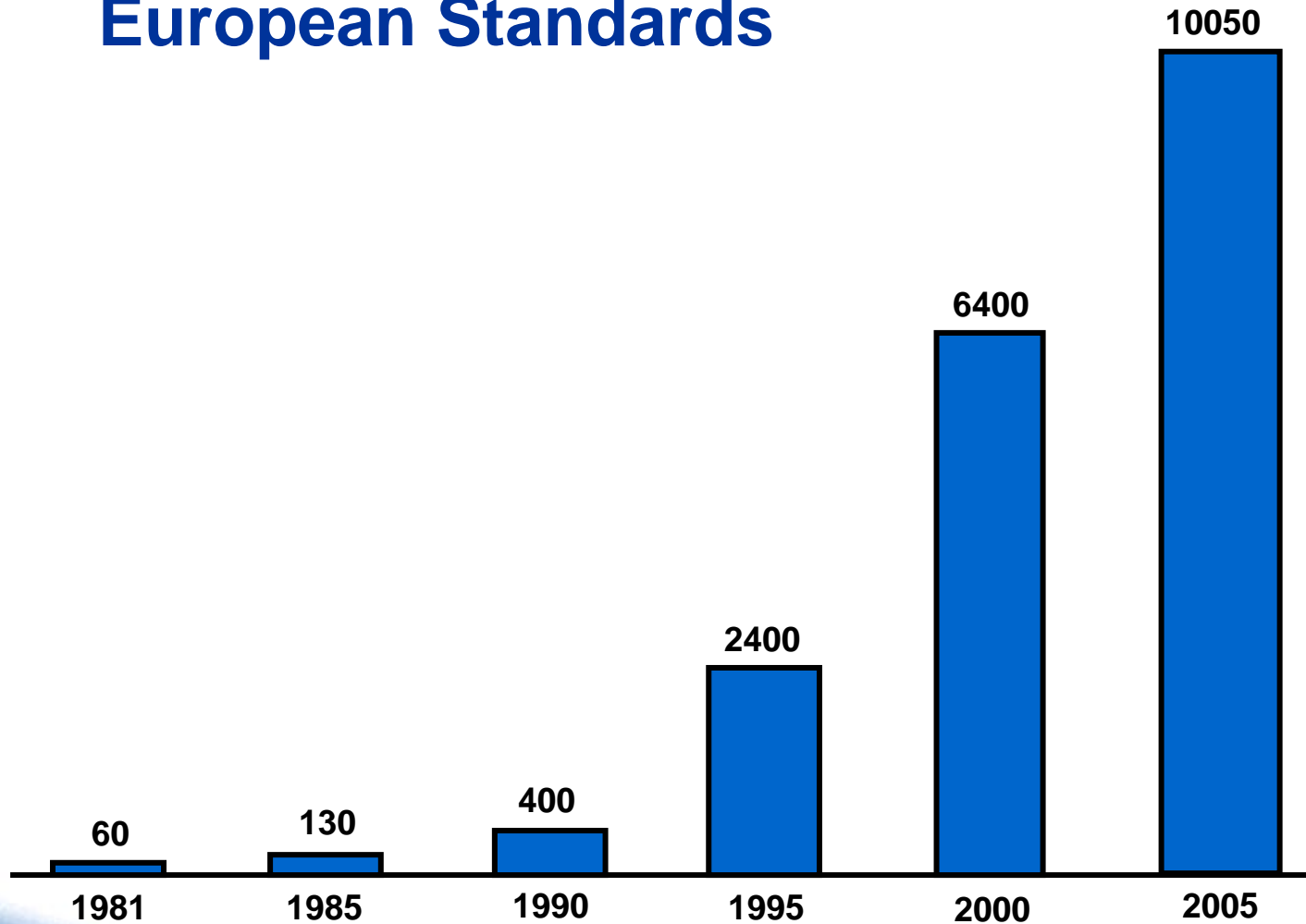
7.2 Inspection

7.2.2 Material Inspection

7.2.2.1.3 Casting Defects

Add new sentence:

Growth of CEN European Standards

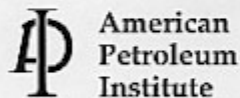


Cumulative number of published CEN standards

Air-Cooled Heat Exchangers for General Refinery Service

API Standard 661, Fifth Edition
March 2002

ISO 13706: 2000, Petroleum and Natural Gas Industries—Air-cooled Heat Exchangers



Helping You
Get The Job
Done Right.™



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 13706

April 2000

ICS 75.180.20

English version

Petroleum and natural gas industries - Air-cooled heat exchangers (ISO 13706:1998)

Industries du pétrole et du gaz naturel - Echangeurs de chaleur refroidis à l'air (ISO 13706:1998)

Erdöl- und Erdgasindustrien - Luftgekühlte Wärmetauscher (ISO 13706:1998)

This European Standard was approved by CEN on 15 April 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



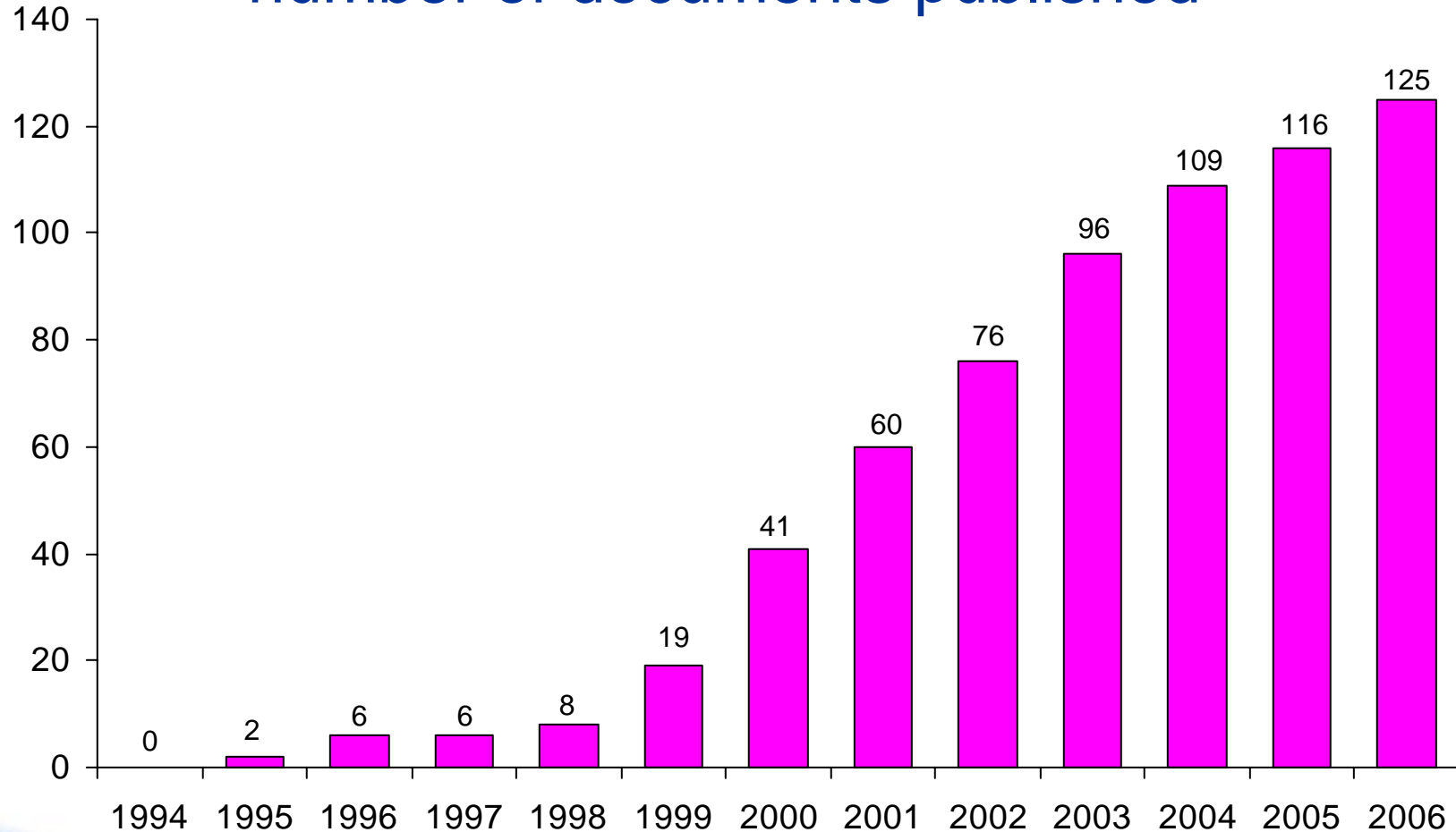
EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Steuart, 36 B-1050 Brussels

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Ref. No. EN ISO 13706:2000 E

ISO/TC67 accomplishments: Cumulative number of documents published



Note: excluding "fasttrack" ISOs

ISO/IEC references in Shell documents

	<u>1990</u>	<u>2003</u>
ISO	30	550
IEC	100	250
	130	800

Note: Step change in usage of ISO/IEC documents



ISO/IEC references in OGP member documents

	<u>1999</u>	<u>2004</u>
ISO	750	1100
IEC	150	500
	900	1600

Note: Change in usage of ISO/IEC documents

Ref: OGP Report (2005) - Catalogue of International Standards used in the petroleum and natural gas industries



30 KEY ITEMS FOR ISO/TC67

SUBSURFACE

- ISO 10432 SSSV
- ISO 11960 Casing & tubing
- ISO 11961 Drillpipe
- ISO 10426 Well cements
- ISO 13500 Drilling fluids

SUBSEA SYSTEMS

- ISO 13628-1 Subsea systems
- ISO 13628-2 Flexible pipe
- ISO 13628-4 Subsea wellhead & christmas tree
- ISO 13628-6 Subsea production controls
- ISO 13628-8 ROV
- ISO 13628-9 ROT

OFFSHORE STRUCTURES

- ISO 19900 Offshore structures

PRODUCTION EQUIPMENT

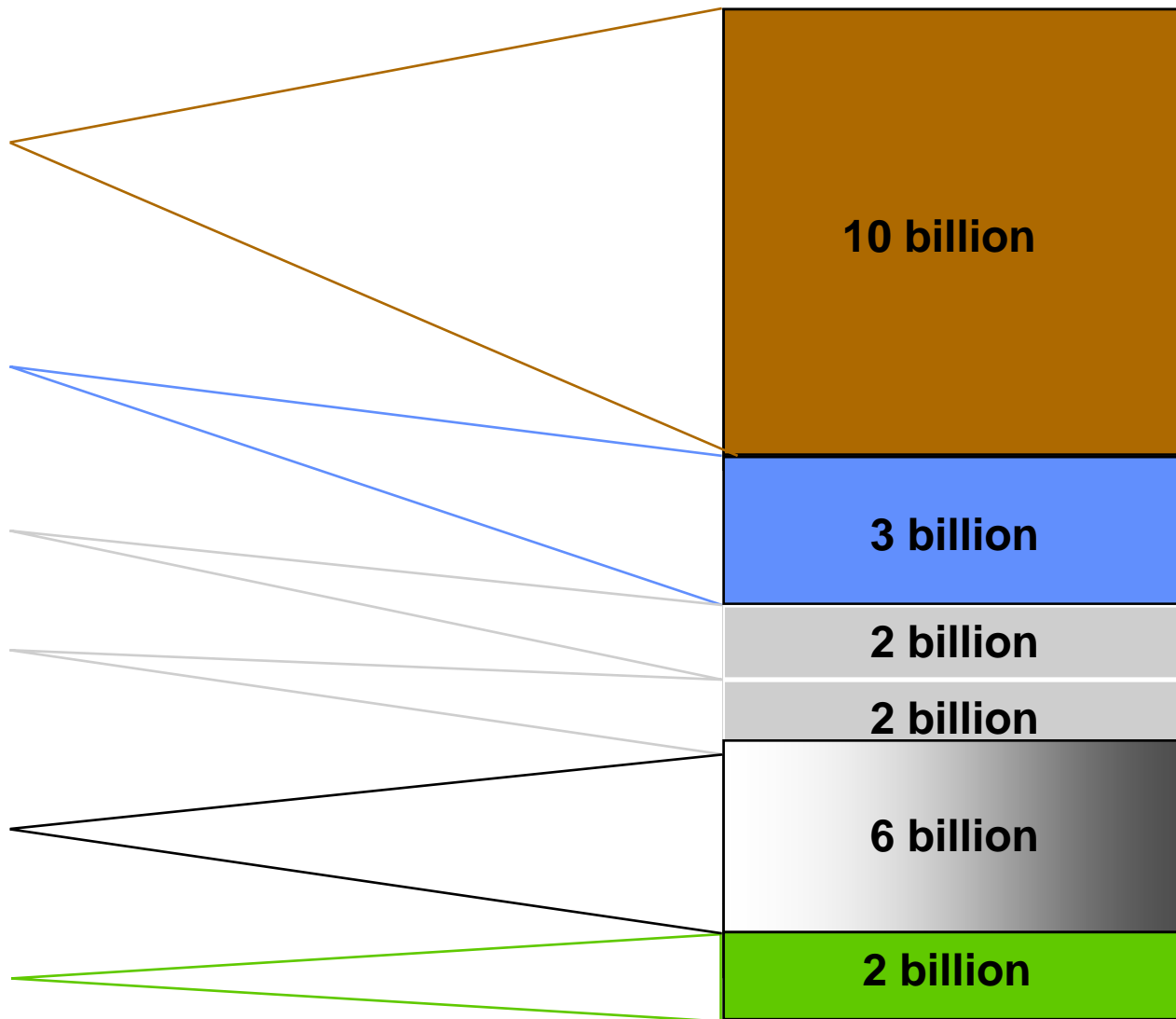
- ISO 10423 Wellhead & christmas trees
- ISO 13533 Drill-through equipment
- ISO 13535 Hoisting equipment
- ISO 15649 Piping systems

PIPELINES

- ISO 13623 Pipeline systems
- ISO 3183 Linepipe
- ISO 13847 Pipeline welding
- ISO 14313 Pipeline valves
- ISO 15589 Cathodic protection
- ISO 15589 Bends, flanges & fittings

PROCESS FACILITIES

- ISO 10437 Steam turbines
- ISO 10439 Centrifugal compressors
- ISO 10441 Flexible couplings
- ISO 13706 Air-cooled heat exchangers
- ISO 13707 Reciprocating compressors
- ISO 13709 Centrifugal pumps
- ISO 21049 Shaft-sealing systems



TOTAL USD 25 billion p.a.

Slide 37

Piping Classes (one of the 303 DEPs)

- Pre-designed piping systems for a wide variety of services
- Direct link to materials catalogue
- Large reduction in engineering and procurement effort
- Integrity control (continuously updated for code compliance)
- Company-wide standardization
- Variety control (greatly reduced spares holding)
- Increased leverage (larger volume of fewer components)

Caps
Elbows
Tees
Reducers
Branch fittings



Check valves
Gate valves
Globe valves
Ball valves
Butterfly valves



Shell Piping Classes

Direct reference from DEP to the MESC catalogue

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																	
PIPE (API SL-W, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API SL-W, EN)	74.13.14								211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE (API SL-W, SAM)	74.13.17																
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	064.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ARNE FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	350.1	356.1	358.1	358.1	310.1	312.1	314.1	316.1	308.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD ENDS	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	548.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	685.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	548.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	685.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
CHECK VALVE SOCKET WELD	77.10.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED	77.20.04	003.1	004.1	005.1	007.1												
GATE VALVE SOCKET WELD	77.20.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.04	003.1	004.1	005.1	007.1												
GLOBE VALVE SOCKET WELD	77.30.05	003.1	004.1	005.1	007.1												
GLAND VALVE SOCKET WELD	77.30.20					008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGLED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
WATER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.19					402.1	404.1	406.1	408.1	420.1	421.1	422.1	423.1	424.1			



Noun: Flanges
 Modifiers: Pipe
 Welding Neck

HEADER CHARACTERISTICS :

Design spec: ASME B16.5
 Dimensional spec, pipe: ASME B36.10M/19M
 Mat: Carbon Steel
 Mat, spec: ASTM A105M
 Facing, flange: raised face
 Finish, flange facing: smooth
 Pressure designation: 150
 ASME CL
 Service:
 Service requirement:
 Temperature limit:
 deg C
 Add reqmts: SIOP SPE 76/001 DOC
 SIOP SPE 76/002 DOC
 Inspection, certif: ISO 10474 -3.1B
 WNLFL CS71
 Caps code:
 MESC: 766278.214.1 Flg Pipe Wn A105M CLL150 20 DN350
 Groove number:
 Mass: 50.00 kg
 Schedule number, hub: 20
 Size: 350 DN



Piping class
 DEP

Buying description
 CMT/MESC

Deliverable

A Piping class consist of a collection of *standardized* piping components, that are compatible and suitable for a defined service at stated pressure and temperature limits



Members of ISO/TC 67

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Promote reference to international standards in regulations – or avoid need for regulations

- 1. To facilitate export of products manufactured nationally, and to facilitate inward investment from overseas.**
- 2. Adopt as many as possible ISO/IEC standards with as few changes as possible.**
- 3. Use same standard as used in Europe, America, China, and elsewhere with all the sustainable benefits of that.**
- 4. Use ISO/IEC Guide 21 as a guide for the procedure for the national adoption of ISO/IEC standards.**
- 5. Energy and organization needed to create committees from all the stakeholders to do this work.**

