

Standards & Best Practices

IRF Summit Conference, Stavanger,
4-5 October 2011

Jan de Jong, SODM
Steve Walker, UK HSE
Alf Reidar Johansen, OGP
Neil Reeve, ISO/TC67



International Regulators' Forum

Standards & Best Practices

Following Montara and Macondo:

- Importance of comprehensive set of standards emphasised
- Drive towards greater consistency of worldwide safe practice
- IRF has a role

Key benefits of standards for IRF: Promote

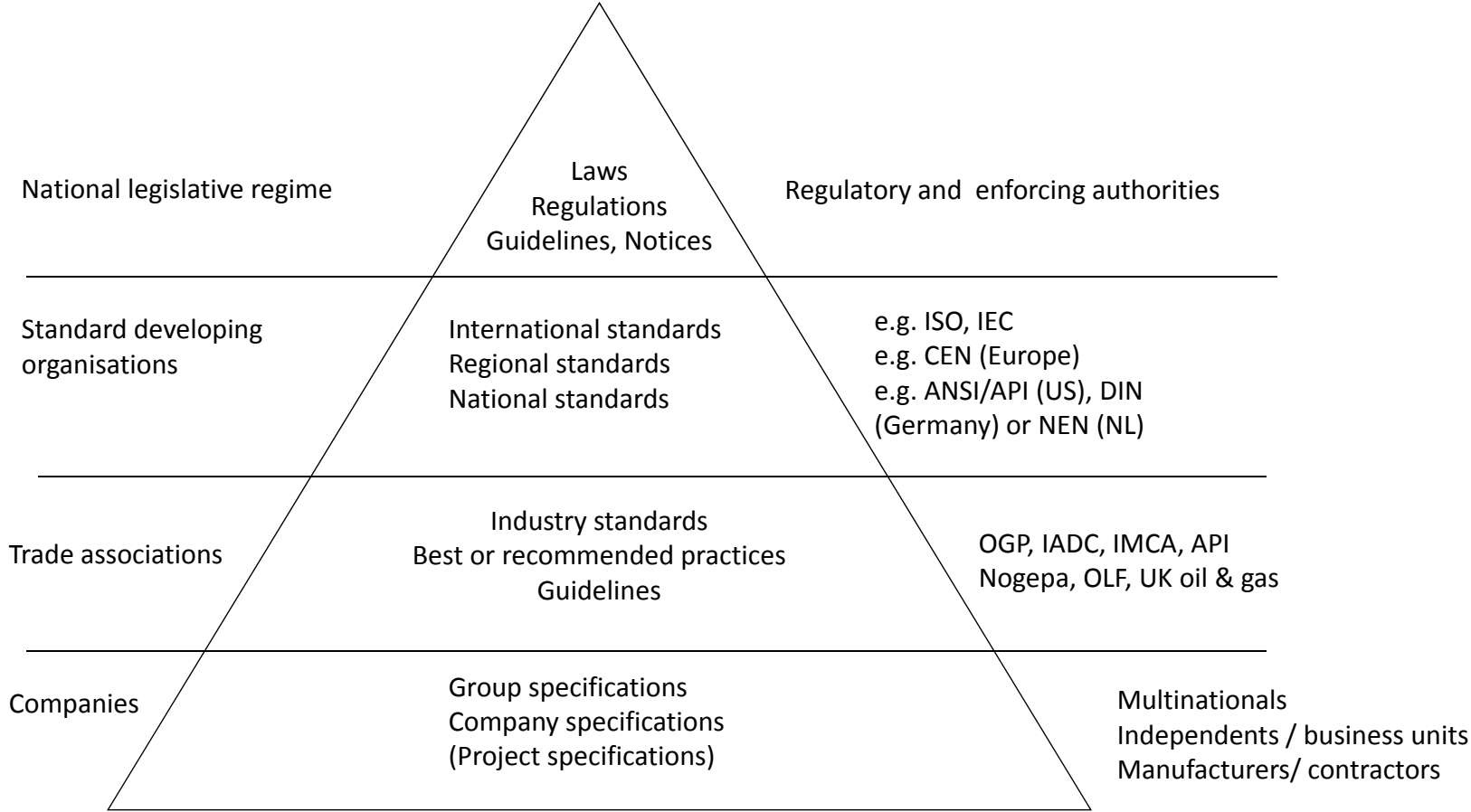
- Safety
- Health
- Protection of the environment

Must be joint effort of all stakeholders

See paper *"The involvement of IRF in setting standards and best practices"* prepared for this conference.



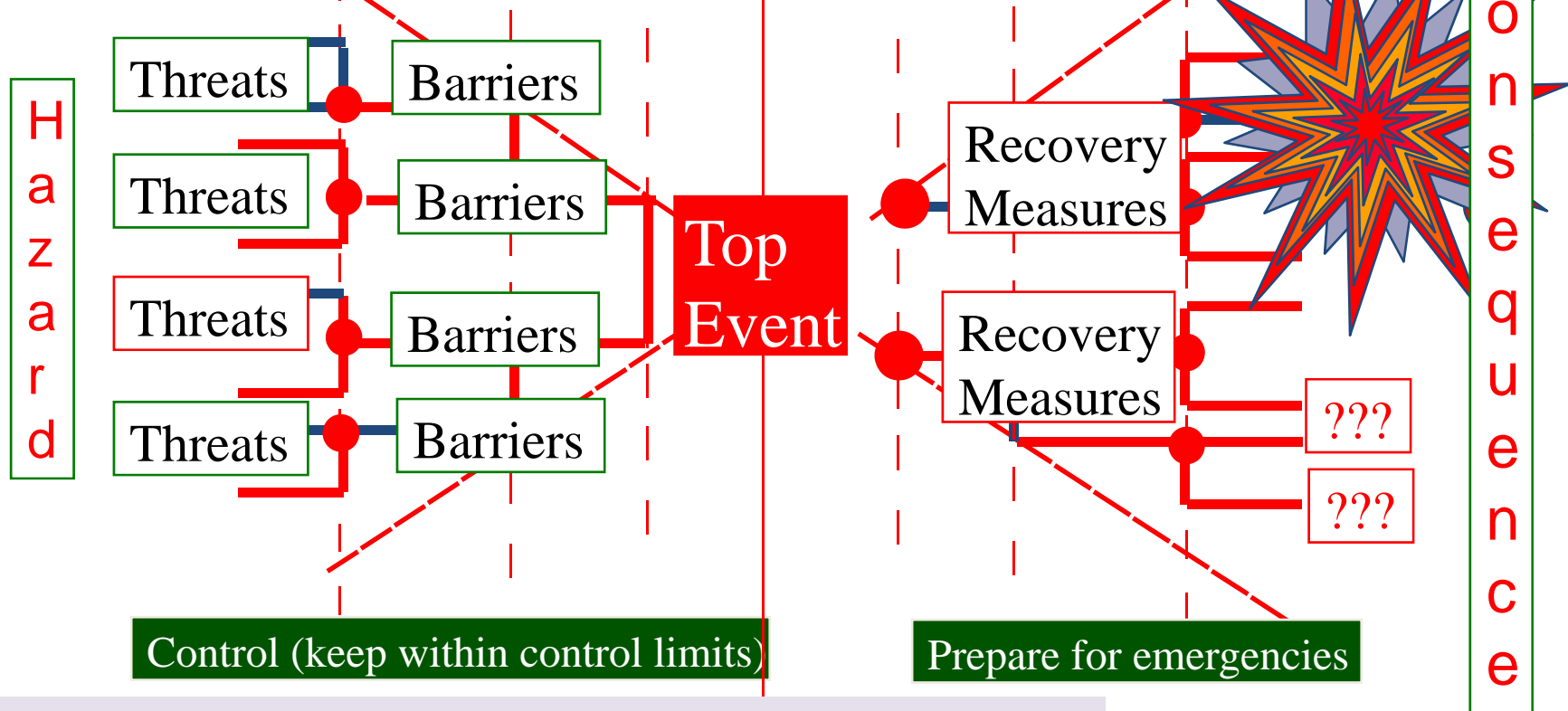
Hierarchy of standards



The bow-tie

Objective: reduce likelihood
(pro-active/preventative)

Objective: mitigate consequences
and re-instate (re-active)



Global standards play role in quality and effectiveness of both prevention and mitigation barriers



Why should regulators be involved?

Because consensus standards can:

- enhance technical integrity
- be alternative to prescriptive legislation
- reduce the need for regulatory document text
- provide a “level playing field” between countries
- enable cross border movement (especially mobile facilities)
- make easier for regulator to amend guidance than amend supporting legislation.



OGP Reports



- Value of standards (OGP Report 440)
- Position paper on development & use of International Standards (381)
- Regulators' use of standards (426)
- Global standards used locally worldwide (4210)
- Deepwater wells (463)

OGP reports freely available at www.ogp.org.uk

Value of standards



- Standards are the tools we use to organise our technical world
- Quality improvement
- Ensuring consistent and reliable engineering
- Compatibility and efficiency (cost and time reduction)
- Global trade (promotes trading, facilitates partnership and international operation)
- Sharing and dissemination of the knowledge and experience

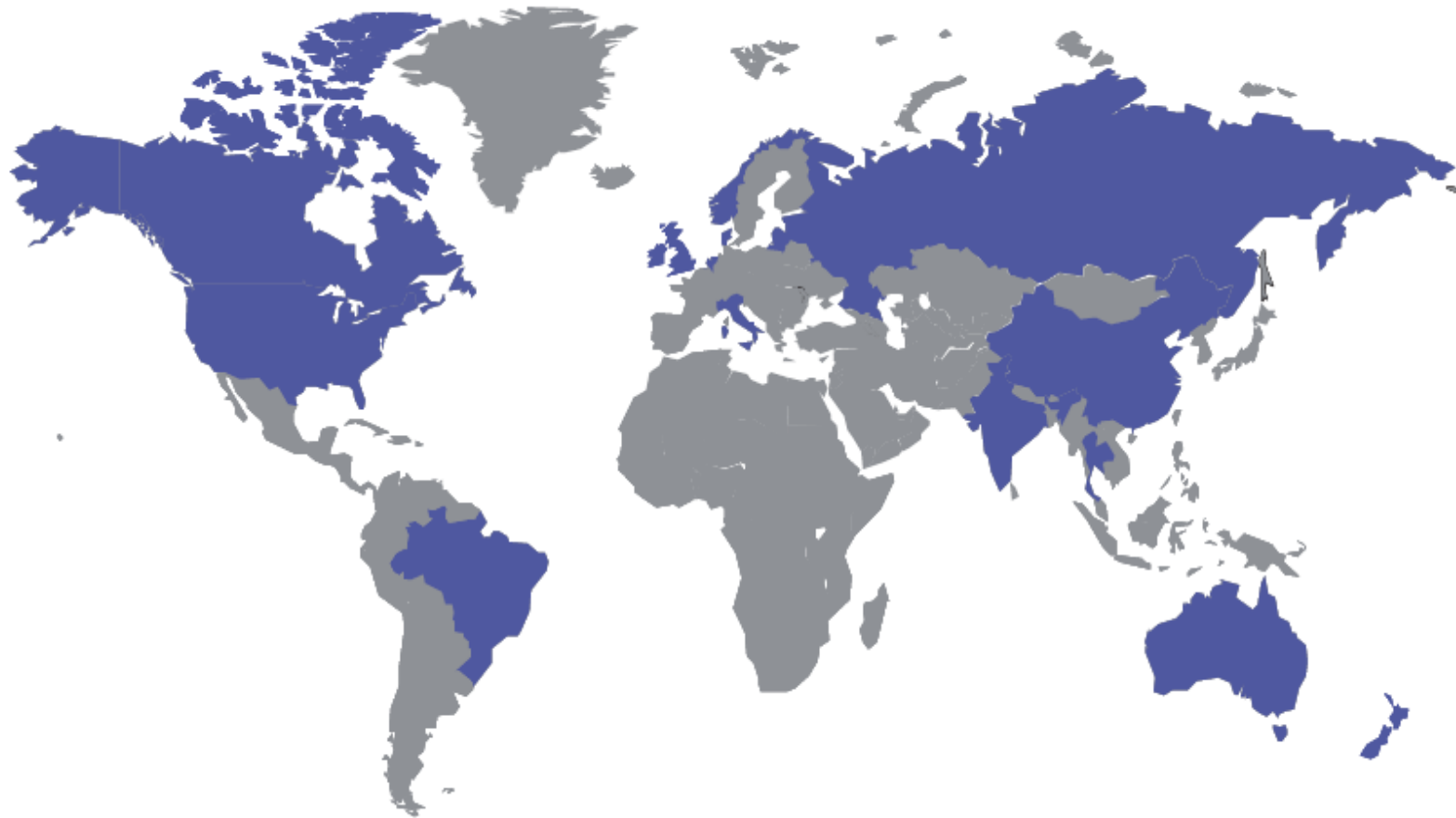
PS: References by seven global operating companies to more than 5.180 standards.

Position paper



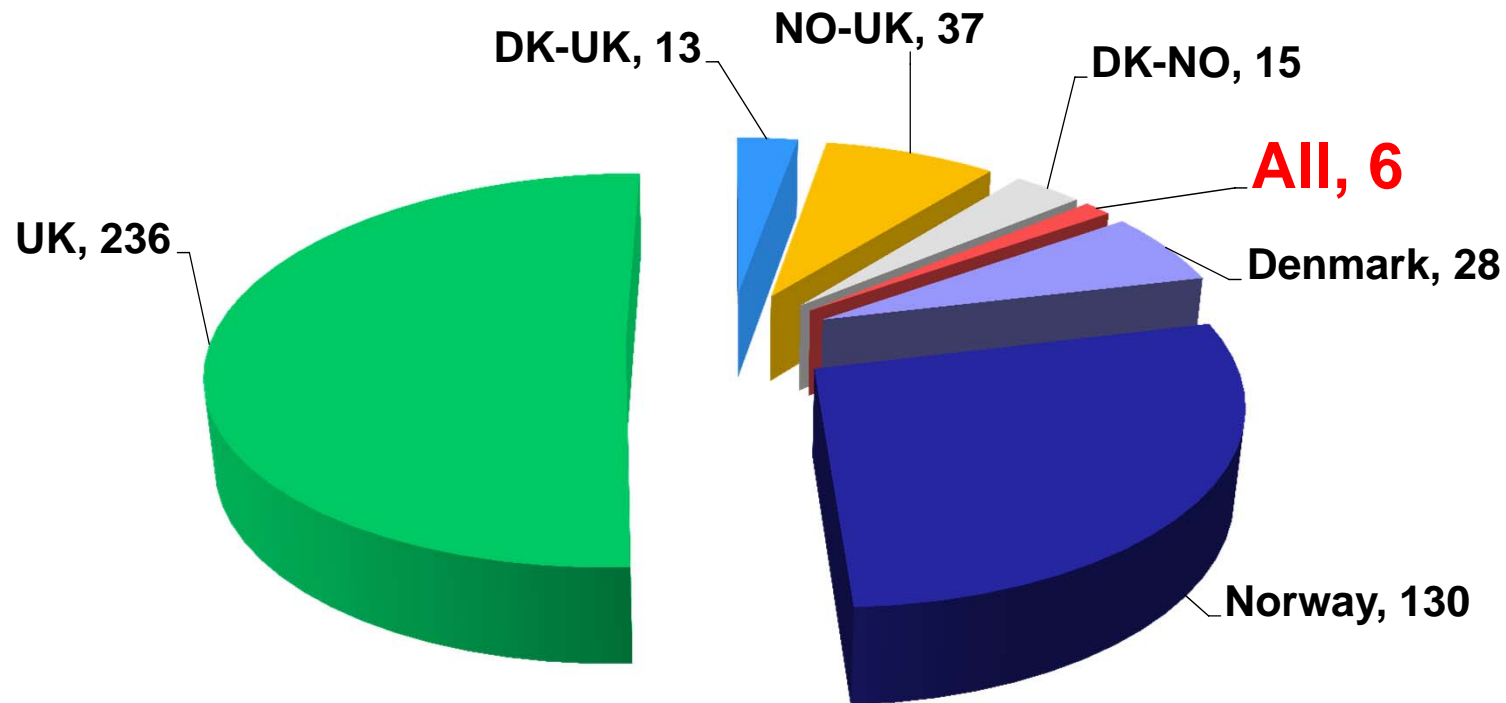
- Promote development and use of international standards
- International standards should be used without modification
- International standards should recognise regional variations
- Avoid duplication of effort
- Company specifications should be minimised
- OGP encourages its members to be well represented on all critical standardisation work groups

Regulators' use of standards



Thirteen national regulators' examined with focus on the offshore petroleum industry.

Danish-Norwegian-UK references



DK+NO+UK reference 465 standard titles in total
Only 6 common (all) references

Conclusion on Regulators' use of standards



- Regulators make good use of standards!
- Little harmonization by regulators in their use of standards.
- Diversity of references provides additional work for global operators.
- Majority of reference standards from US.
- Duplication of standards.
- References to international standards have increased compared to earlier analysis.

OGP GIRG Recommendations



- Promote international standards
- Robust standards and practices are critical to prevention of accidents
- Encourage OGP members to meet or exceed and verify adherence to these standards.
- Recognise existing standards as the baseline for industry improvement.
- Promote use of industry good practices and standards as a basis for continuous industry improvement with additional GIRG recommendations.
- Influence and renew ISO, API and other industry standards.
- Harmonise international and national standards.
- Support ISO/TC67 efforts following Montara & Macondo.
- Encourage regulators to participate actively in international standards work and to make references to more globally relevant standards.

ISO/TC 67: Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries



Scope: Standardization of the **materials, equipment** and offshore structures used in the drilling, production, transport by pipelines and processing of liquid and gaseous hydrocarbons within the **petroleum, petrochemical and natural gas industries**.

Excluded: aspects of offshore structures subject to IMO requirements (ISO/TC 8).

www.iso.org

ISO/TC 67 Vision

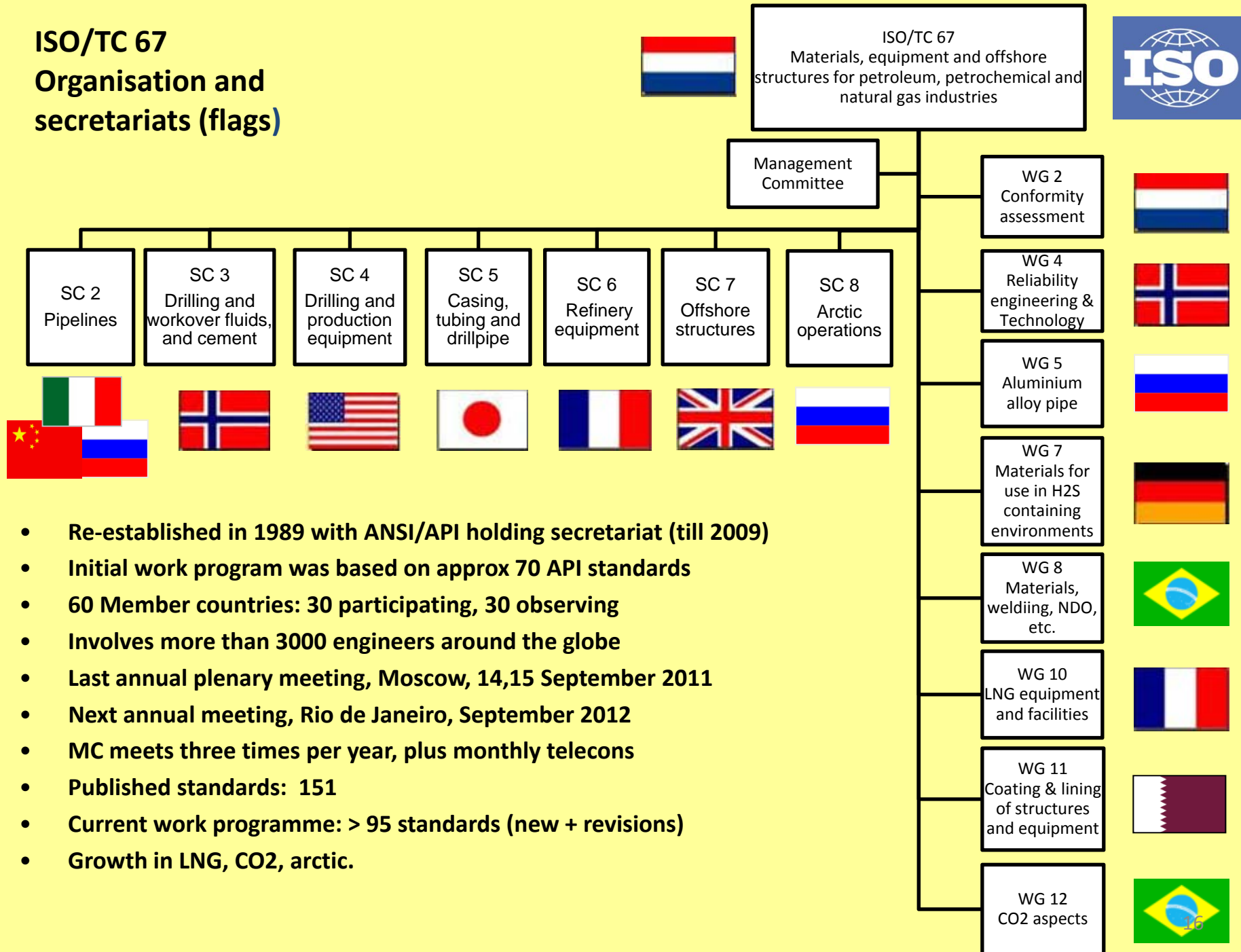


Goals of ISO/TC 67



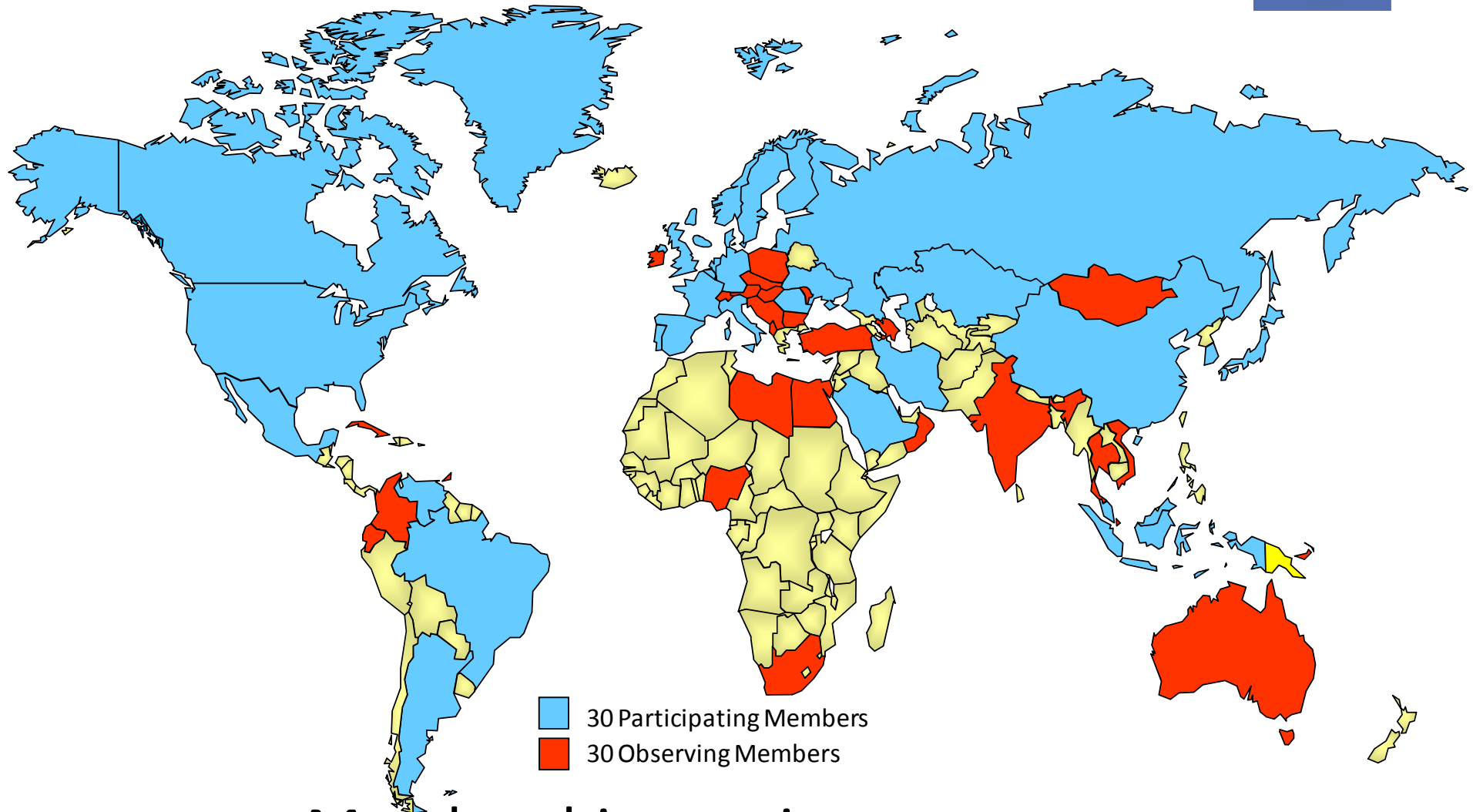
- Prepare standards required by this industry
- Prepare standards that are adopted worldwide by bodies such as ABNT (Brazil), API (USA), CEN (Europe), GOST R (Russian Federation), GSO (Gulf Region) and SAC (China)
- Prepare standards that are recognized by regulators
- Publish standards that enable companies to minimize their specifications
- Deliver standards to the target dates on the agreed work programme

ISO/TC 67 Organisation and secretariats (flags)



- Re-established in 1989 with ANSI/API holding secretariat (till 2009)
- Initial work program was based on approx 70 API standards
- 60 Member countries: 30 participating, 30 observing
- Involves more than 3000 engineers around the globe
- Last annual plenary meeting, Moscow, 14,15 September 2011
- Next annual meeting, Rio de Janeiro, September 2012
- MC meets three times per year, plus monthly telecons
- Published standards: 151
- Current work programme: > 95 standards (new + revisions)
- Growth in LNG, CO2, arctic.

ISO/TC 67 Country members



Membership continues to grow

ISO Standards for use in the oil & gas industry

ISO 10418 Basic surface safety systems
ISO 10423 Wellhead & christmas tree equipment
ISO 13533 Drill-through equipment (BOPs)
ISO 13534 Hoisting equipment - care/maint
ISO 13535 Hoisting equipment - specification
ISO 13626 Drilling and well-servicing structures
ISO 13702 Control & mitigation of fire & explosion
ISO 13703 Offshore piping systems
ISO 14224 Reliability/maintenance data
ISO 14692 GRP piping, Parts 1-4
ISO 14693 Drilling equipment

ISO 15156-1 Selection of cracking resistant materials for use in H₂S environments
ISO 15156-2 Cracking-resistant steels and cast irons for use in H₂S environments
ISO 15156-3 Cracking-resistant alloys for use in H₂S environments
ISO 15138 HVAC
ISO 15544 Emergency response
ISO 15663 Life cycle costing, Parts 1-3
ISO 17774 Assessment of hazardous situations
ISO 20815 Production assurance and reliability management
ISO 21457 Materials selection (New)
ISO 23936-1 Thermoplastics
ISO 23936-2 Elastomers (New)
ISO/TS 27469 Method of test for offshore fire dampers (New)
ISO/TS 29001 Sector-specific quality management systems (Rev)

ISO 19900 Offshore structures - general requirements
ISO 19901-1 Metocean design and operating considerations
ISO 19901-2 Seismic design
ISO 19901-3 Topside structure (New)
ISO 19901-4 Geotechnical and foundation design
ISO 19901-5 Weight control
ISO 19901-6 Marine operations
ISO 19902 Fixed steel offshore structures
ISO 19903 Fixed concrete offshore structures
ISO 19905-1 Jack-ups (New)
ISO/TS 19905-2 Jack-ups commentary
ISO 19906 Arctic offshore structures (New)

ISO 3977-5 Gas turbines - procurement
ISO 10428 Sucker rods
ISO 10431 Pumping units
ISO 10434 Bolted bonnet steel gate valves
ISO 10437 Special-purpose steam turbines (Rev)
ISO 10438 Lubrication, shaft-sealing and control-oil systems, Parts 1-4
ISO 10439 Centrifugal compressors
ISO 10440-1 Rotary-type positive-displacement process compressors (oil-free)
ISO 10440-2 Rotary PD packaged air compressors
ISO 10441 Flexible couplings - special
ISO 10442 Integrally geared air compressors
ISO 12211 Spiral plate heat exchangers (New)
ISO 12212 Harpin heat exchangers (New)
ISO 13631 Reciprocating gas compressors
ISO 13691 High speed enclosed gear units
ISO 13704 Calculation of heater tube thickness
ISO 13705 Fired heaters for general service
ISO 13706 Air-cooled heat exchangers (Rev)
ISO 13707 Reciprocating compressors
ISO 13709 Centrifugal pumps
ISO 13710 Reciprocating positive displacement pumps (Rev)

ISO 14691 Flexible couplings - general
ISO 15547-1 Plate & frame type heat exchangers
ISO 15547-2 Brazed aluminium platefin type heat exchangers
ISO 15649 Piping
ISO 15761 Steel valves DN 100 and smaller
ISO 16812 Shell & tube heat exchangers
ISO 17292 Metal ball valves
ISO 21049 Centrifugal and rotary pumps shaft sealing (Rev)
ISO 22521 Pressure-relieving and depressuring systems
ISO/TS 24817 Composite repair of pipework
ISO 25457 Flares details
ISO 28300 Venting of storage tanks
ISO 28460 LNG - Ship to shore interface (New)

ISO 13624-1 Marine drilling riser systems
ISO/TR 13624-2 Marine drilling riser system analysis
ISO 13625 Marine drilling riser couplings
ISO 19901-7 Station-keeping systems for floating offshore structures (Amd)
ISO 19904-1 Floating offshore structures

ISO 13628-1 Subsea production systems (Amd)
ISO 13628-2 Subsea flexible pipe systems
ISO 13628-3 Subsea TFL pumpdown systems
ISO 13628-4 Subsea wellhead and tree equipment (Rev)
ISO 13628-5 Subsea control umbilicals
ISO 13628-6 Subsea production controls
ISO 13628-7 Completion/workover riser system
ISO 13628-8 ROV and interfaces (Rev)

ISO 13628-9 ROT intervention systems
ISO 13628-10 Bonded flexible pipe
ISO 13628-11 Flexible pipe systems for subsea and marine applications
ISO 13628-15 Subsea structures and manifolds (New)
ISO 13628-16 Spec for flexible pipe ancillary equipment (New)
ISO 13628-17 RP for flexible pipe ancillary equipment (New)

ISO 10427-2 Centralizer placement and stop-collar testing
ISO 10427-3 Performance testing of cement float equipment
ISO 10432 Subsurface safety valves
ISO 11960 Casing and tubing (Rev)
ISO 11961 Drill pipe
ISO 13085 Tubing aluminium alloy pipes (New)
ISO 13500 Drilling fluids (Amd)
ISO 13501 Drilling fluids - processing systems evaluation (Rev)
ISO 13503-1 Measurement of viscous properties of completion fluids (Rev)
ISO 13503-2 Measurement of properties of proppants
ISO 13503-3 Testing of heavy brines
ISO 13503-4 Measurement of stimulation & gravelpack fluid leakoff
ISO 13503-5 Measurement of long term conductivity of proppants
ISO 13678 Thread compounds (Rev)
ISO 13679 Casing and tubing connections testing (Rev)
ISO 13680 CRA seamless tubes for casing and tubing (Rev)

ISO 14310 Packers and bridge plugs
ISO 15136-1 Progressing cavity pump systems
ISO 15136-2 Progressing cavity pump systems - drive heads
ISO 15463 Field inspection of new casing, tubing and plain end drill pipe
ISO 15464 Gauging and inspection of threads
ISO 15546 Aluminium alloy drill pipe (Rev)
ISO 16070 Lock mandrels and landing nipples
ISO 17078-1 Side-pocket mandrels (Amd)
ISO 17078-2 Flow control devices for side-pocket mandrels
ISO 17078-3 Latches & seals for side-pocket mandrels & flow control devices
ISO 17078-4 Side-pocket mandrels and related equipment (New)
ISO 17824 Sand control screens
ISO 20312 Design of aluminium drill string (New)
ISO 21609-2 Aluminium drill pipe thread gauging (New)
ISO 21609-3 Polyethylene coatings (2-layer PE)
ISO 21609-4 External concrete coatings (New)
ISO 21609-5 Fusion-bonded epoxy coatings
ISO 21809-2 Field joint coatings (Amd)
ISO 21809-3 Polyethylene coatings (2-layer PE)
ISO 21809-5 External concrete coatings (New)

ISO 3183 Steel pipe for pipeline transportation systems
ISO 12490 Actuation, mechanical integrity and sizing for pipeline valves (New)
ISO/TS 12747 Pipeline life extension (New)
ISO 13623 Pipeline transportation systems
ISO 13847 Pipeline welding
ISO 14313 Pipeline valves
ISO 14723 Subsea pipeline valves
ISO 15589-1 Cathodic protection for on-land pipelines
ISO 15589-2 Cathodic protection for offshore pipelines (Rev)
ISO 15590-1 Pipeline induction bends
ISO 15590-2 Pipeline fittings
ISO 15590-3 Pipeline flanges
ISO 16708 Pipeline reliability-based limit state design
ISO 21329 Test procedures for pipeline mechanical connectors
ISO 21809-1 Polyolefin coatings (3-layer PE and 3-layer PP) (New)
ISO 21809-2 Fusion-bonded epoxy coatings
ISO 21809-3 Field joint coatings (Amd)
ISO 21809-4 Polyethylene coatings (2-layer PE)
ISO 21809-5 External concrete coatings (New)

ISO/TR 10400 Calculations for OCG performance properties
ISO 10405 Care/use of casing/tubing
ISO 10407-1 Drill stem design
ISO 10407-2 Inspection and classification of drill stem elements
ISO 10414-1 Field testing of water-based fluids
ISO 10414-2 Field testing of oil-based drilling fluids (Rev)
ISO 10416 Drilling fluids - lab testing
ISO 10417 Subsurface safety valve systems
ISO 10424-1 Rotary drill stem elements

ISO 10424-2 Threading and gauging of connections
ISO 10426-1 Well cementing
ISO 10426-2 Testing of well cements (Rev)
ISO 10426-3 Testing of deepwater well cement
ISO 10426-4 Preparation and testing of atmospheric foamed cement slurries
ISO 10426-5 Shrinkage and expansion of well cement
ISO 10426-6 Static gel strength of cement formulations
ISO 10427-1 Bow spring casing centralizers

ISO 21809-2 Fusion-bonded epoxy coatings
ISO 21809-3 Field joint coatings (Amd)
ISO 21809-4 Polyethylene coatings (2-layer PE)
ISO 21809-5 External concrete coatings (New)



Standards in brown issued in 2010
 Standards in green are a priority for 2011 issue
 These ISO standards are only a core collection of several hundreds of International Standards available for the oil & gas industry

ISO/TC 67 has published 151 standards.
 API has adopted 80 of these as joint API / ISO standards.
 CEN has adopted 136 of these as joint European EN ISO standards.
 Brazil (31), China (55), Gulf Region (78), Kazakhstan (89), Russia (30) etc. have also adopted (a number of) these as national standards. Recent and accelerating.
Companies use these as the basis for their company standards

Key principles



One country – one vote:

- But almost all decisions, including document publication are based on consensus

Consensus:

- Not unanimity, but absence of sustained opposition to substantial issues by important stakeholder

Tripartite participation:

- 40% users (oil companies)
- 40% manufacturers/suppliers
- 20% academia, regulators, certification/classification bodies, trade unions etc.

Voluntary:

- A standard does not in itself impose an obligation upon anyone to follow it
- Such obligation may be imposed by legislation/regulation or contract

Verbal forms:

- *Shall* indicates a requirement
- *Should* indicates a recommendation
- *May* indicates a permission
- *Can* indicates a possibility

Regional annexes

- Can meet the particular requirements of one region or country

Equipment versus process standards

- Initial focus on equipment standards – now increasingly also standards for processes

Documented in ISO/IEC Directives (Parts 1 and 2)

Response to Macondo and Montara



ISO/TC 67 is reacting to the Macondo (US) and Montara (Australia) accidents:

- Prepared action plan including immediate and longer term needs (ISO/TC67 document N 1119) – December 2010.
- 30 ISO standards (new and revisions) of which 10 are top priority (Well integrity; Well control / equipment; Cementing; Development and implementation of HSE management systems; Competence of personnel)
- Working closely with all actors involved including API, IRF, CEN, NSOAF, OGP (standards committee and wells experts group),
- The learnings from an accident in one country must be transferred globally.
- International standards developed by ISO/TC 67 are one way of achieving this.
- Stakeholders are requested to support and participate actively.
- An action team is monitoring progress.

IRF participation



Regulator is key stakeholder

More participation from regulators welcome

Specifically:

- Framing the portfolio of required documents
- Ensuring document scopes are relevant
- Debating detailed content on key issues

Concluding proposals

(See details in paper)

1. Support the ISO (and IEC) standards system
2. Create a standing IRF “standards” sub-group
 - set clear priorities
 - monitor progress
 - engage with standards committees
 - influence standards management to meet IRF needs
3. Develop questionnaire for IRF members (standards usage)
4. Consider response to OGP Report “Regulators’ use of standards”; and consider making “list”
5. Distinguish roles on “Good practice” and “Best practice”



Thank you



Back-up



Doc TC67 – N 1119 – extracts



ISO/TC 67 Management Committee AHG Industry Events Action Plan on Recent Industry Events

Table 1:
Proposed ISO/TC 67 programme for drilling, well construction and well operations standards, resulting from the Montara and Macondo accidents

Number	Title	Latest edition	Status	Proposed ISO/TC67 action	Priority
ISO/TC67/WG2 – Conformity assessment					
No number	Competence of personnel		Sourced from Recommendations 62 & 63 of Montara report	As quoted in the Montara report: "Consider how to address the international standards implications of the following issue: Licensees, rig operators and relevant 3rd party should develop well control competency standards for key personnel in other entities involved. Achievement and maintenance of well control should be written into the job responsibilities of key personnel". See also ISO CD 10018.	1
ISO/TC67/WG4 - Reliability engineering & technology					
ISO TR 12489	Reliability modeling and calculation of safety systems		Planned issued end 2011	Proceed standardization activities as already planned	2*
ISO/TC67/SC3 – Drilling and completion fluids, and well cements					
ISO/TC67/SC3/WG2 – Cementing					
ISO 10426-2/ API Spec 10B-2	Testing of well cements	2003/ 2005	ISO in revision	Fully reconsider the in-situ test situation. This part of ISO 10426 specifies methods and gives recommendations for the testing of cement slurries and related materials under simulated well conditions.	1*
ISO 10426-3/ API	Testing of deepwater well	2003	Published in 2003	Consider revision	2*
...etc ...					
NORSOK Z-013	Risk and emergency preparedness analysis	2010		Propose to make new sector specific ISO standard based on NORSOK Z-013, building on ISO 31000. Check gaps/overlaps with ISO 17776	1
IMO MODU Code	Mobile Offshore Drilling Units	2009		Consider whether to approach IMO to propose that this MODU Code should make references to relevant ISO standards from ISO/TC67/SC3/WG1, instead of the provisions in the code. This will align the requirements for drilling plants on fixed and mobile installations.	2
ISO/TC67/SC7 – Offshore Structures					
ISO/TC67/SC7/WG5 – Floating systems					
ISO 15901-7	Stationkeeping systems for floating offshore structures and mobile offshore units	2005	In revision	Ensure standard adequately covers the stability of the drilling vessels, and that the vessel's movements (intact or in damage condition) nor ultimate capsizes could not harm the drilling riser.	2*
Miscellaneous					
OGP Report 435	Safety culture	2010	Interim report from National Academy of Engineering and National Research Council, 2010-11-16	Liaise with OGP to explore ways to establish international standards (arrange workshops) to foster continuous improvement in safety culture.	1
Determine need for potential new Work Group	Inspection. General approach to in-service inspection			Consider what is generically needed to be documented in international standards, and how to address, specifically in relation to in-service inspection. Discuss at next ISO/TC67/MC meeting	2

Table 1 lists 30 items

from the conclusion

To carry out the activities proposed in Table 1 will require considerable effort and resources ...

Some of these activities can be seen as typical ongoing work of ISO/TC 67 ...

Other proposed potential subjects are new..... these will require new resources from the interested stakeholder groups ...

These stakeholder include: countries involved in the international oil industry; oil companies; equipment manufacturers; contractors; national regulators; certification bodies; professional and trade associations; standards organizations

ISO TC67 with OGP, API ...

Timetable of priority 1 documents (today)



PRIORITY 1 STANDARDS OVERVIEW

	Working group	Deliverables	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4	2014 Q1	
1	ISO/TC 67 WG 2	ISO xxxx Competence of personnel	NWIP											
2	ISO/TC67/SC3/WG 2 – Drilling and completion fluids, and well cements - cementing	ISO 10426-2 / API Spec 10B-2 Testing of well cements												
3	ISO/TC67/SC3/WG 2 – Drilling and completion fluids, and well cements - cementing	API RP 65-2 / ISO xxx Isolating Potential Flow Zones During Well Construction												
4	ISO/TC67/SC3/WG 2 – Drilling and completion fluids, and well cements - cementing	ISO 10426-4 / API Spec 10B-4 RP for design and testing of foam cement slurries												
5	ISO/TC67/SC4/WG2 – Drilling well control equipment	ISO 13533/ API_Spec 16A Drill through equipment (BOPs)												
6	ISO/TC67/SC4/WG2 – Drilling well control equipment	ISO xxxxx / API RP 53 BOP equipment systems for drilling wells												
7	ISO/TC67/SC4/WG4 – Production equipment	ISO 16530 Well integrity in the operational phase												
8	ISO/TC67/SC4/WG4 – Production equipment	new Well integrity - Umbrella document	new TF is agreed											
9	ISO/TC67/SC4/WG x – Well Integrity	API RP 96 Deep water well design considerations												
10	ISO/TC67/SC4/WG6 – Subsea equipment	ISO 13628-8 / API 17H Remotely operated tools and interfaces on subsea production systems												
11	ISO/TC67	OGP 210 Guidelines for the development and application of HSE management systems	NWIP											
12	ISO/TC67/SC6/WG 1 – Processing equipment and systems – Offshore platform systems	NORSOK Z-013 Risk and emergency preparedness analysis												
13		OGP Report 435 Safety culture												