

**Workshop on Development of Standards and Guidelines for Activities in the Area
Pretoria, South Africa / May 12nd, 2019**

ISO: the Role and Process for Developing Standards

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Director, Second Institute of Oceanography**

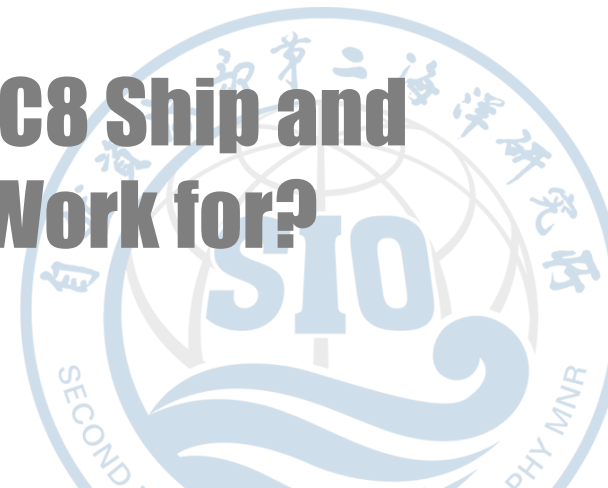
A photograph of a sailboat's white sail and rigging against a clear blue sky and a deep blue ocean. The boat is on the left side of the frame, with the water extending to the horizon.

Outline

What is the Role of International Organization for Standardization?

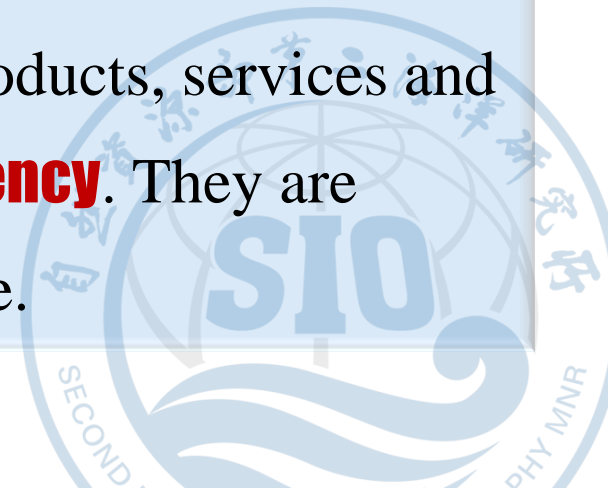
How are International Standards Developed?

What does the ISO/TC8 Ship and Marine Technology Work for?



International Standard

- They provide **rules, guidelines or characteristics** for activities or for their results, aimed at achieving the optimum degree of order in a given context.
- They can take many forms, including **product standards, test methods, codes of practice, guideline standards** and **management systems standards**.
- They give **world-class specifications** for products, services and systems, **to ensure quality, safety and efficiency**. They are instrumental in facilitating international trade.



International Organizations for Standardization



International Organization for Standardization

- Develops **comprehensive international standards**
- Founded in Geneva in 1947
- Membership of 164 national standards bodies
- Published > **22600** international standards (**largest**)



International Electrotechnical Commission

- Develops International Standards in the fields of electrotechnology
- Founded in London in 1906
- 81 national members
- Published > **6700** International Standards



International Telecommunication Union

- Concerns information and communication technologies
- Founded in 1865 (**earliest**)
- 192 national members
- Published > **5000** International Standards

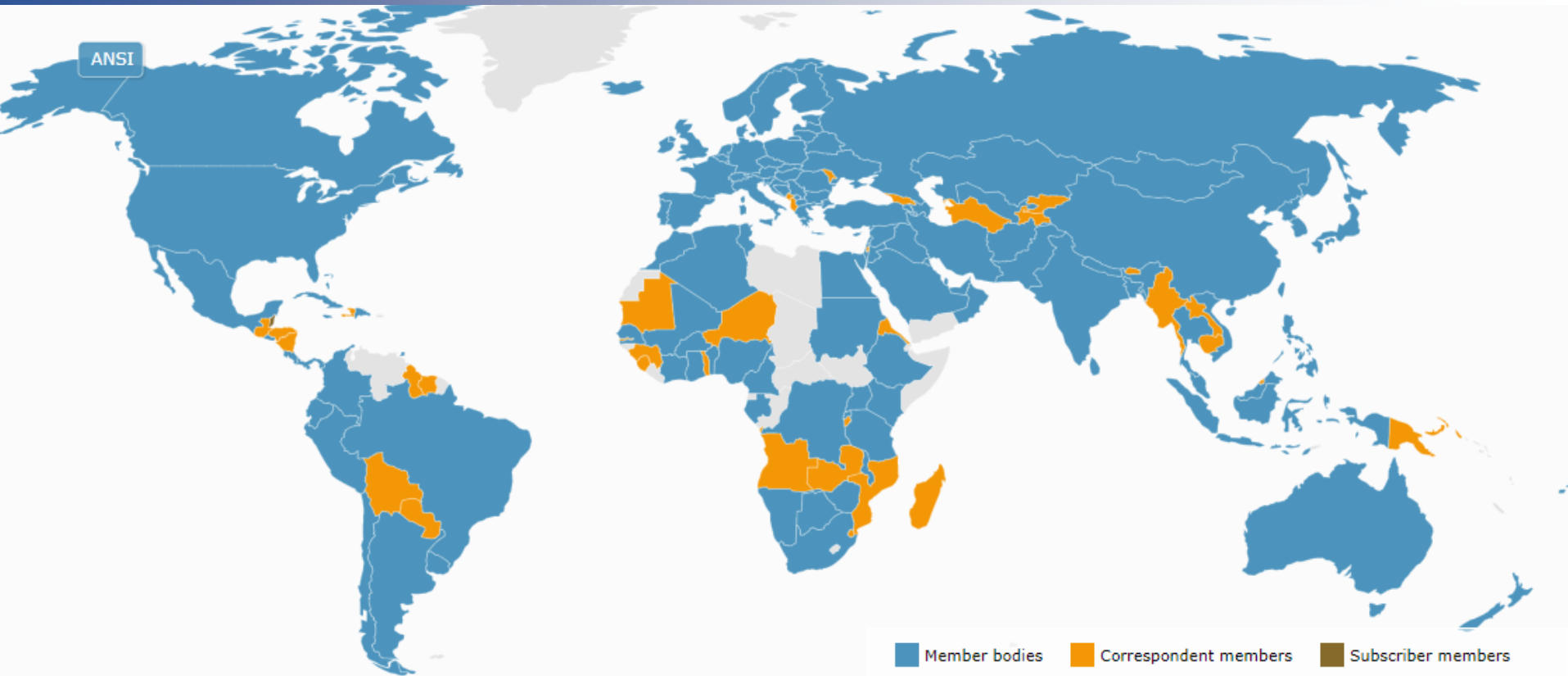


In 1946, delegates from 25 countries meet in London to discuss the future of standardization.

International standardization movement was of great significance to the reconstruction, progress and future peace of the world.

——Howard Coonley, ISO President (1947-1949)

ISO: a Global Network of National Standards Bodies



World population 97%, National income 98%



ISO Milestone

ISO membership

ISO MEMBERSHIP
CONTRIBUTION TO
THE STANDARDS PROCESS
(2014-12-31)

■ : Number of secretariats
■ : Number of countries

1947:

ISO was founded

1951:

1st standard *Temperature measurement*

1987:

ISO 9001 *Quality management*

1996:

ISO 14000 *Environmental management*

2010:

ISO 26000 *Social responsibility*

2011:

ISO 50001 *Energy management*

2016:

ISO 37001 *Anti-bribery management*

2017:

ISO 20400 *Sustainable procurement*

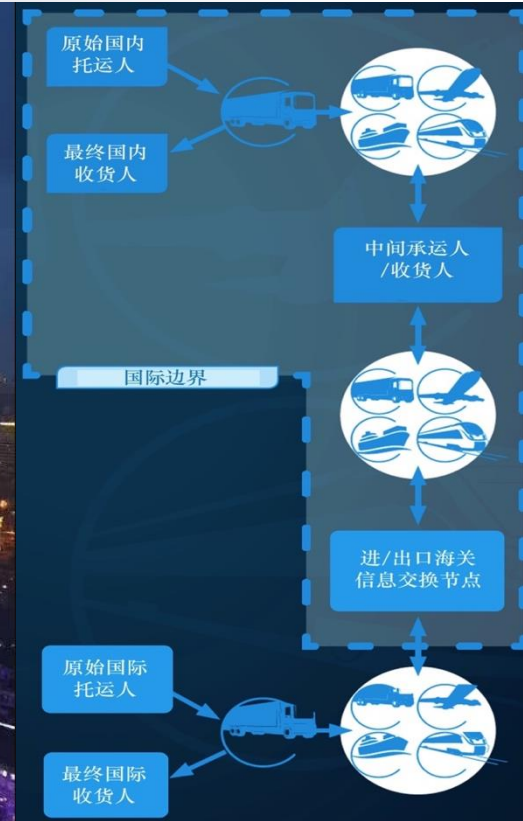
2017:

ISO 19434 *Mining – Classification of mine accidents*

At the end of 2014, ISO's worldwide membership was comprised of the principal standards bodies of **165 countries**.

Promoting Global Commerce - 1

Made-in-World and Global Trade



ISO 28000: 2007 (*Security Management Systems for Supply Chain*) specifies requirements for security assurance of supply chain, incl. all stages of transportation from first delivery to final receiver

Driving Industrial Progress - 2

*Why the future
belongs to*
STANDARDS



ISO 9000: 2015 (*Quality Management Systems*) has created a miracle and become widely used standard for >60 industry sectors, incl. safety, health, medicine, energy, information and environment

Strengthening Environmental Protection - 3



ISO 14000 family (*Environmental Management*) provides practical tools for all looking to manage their environmental responsibilities, and now more than 320,000 institutions has been certified

Improving Public Safety - 4

Disasters... **be prepared!**



Nuclear emergency preparedness and response – ISO 11320

Audible evacuation signal – ISO 8201

Water safety signs/ beach safety flags – ISO 20712

Safety colours and signs – ISO 7010
Escape and evacuation plan signs – ISO 23601

Transport communication networks for disaster relief and emergencies – ISO 18317*

Emergency management and incident response – ISO 22320, ISO 22325* (capability), ISO 22322* (public warning), ISO 22319* (volunteer involvement), ISO 22324* (colour-coded alert)

Crisis management of water utilities – ISO 24518*

Public transport emergency evacuation and disaster response – ISO 19083*

Mass evacuation – ISO 22315

Fire hoses – ISO 14557

Protective clothing – ISO 11613

* under development

Sustainable Development - 6

- food,
- health,
- water,
- energy,
- infrastructure,
- best practices,
- smart cities,
- climate change,
- ocean,
- biodiversity ...



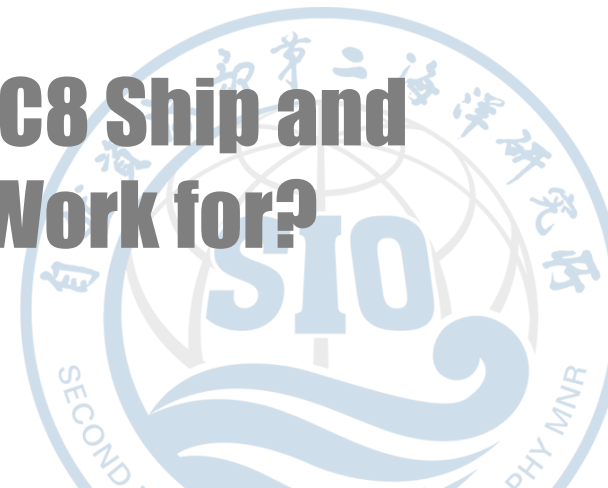


Outline

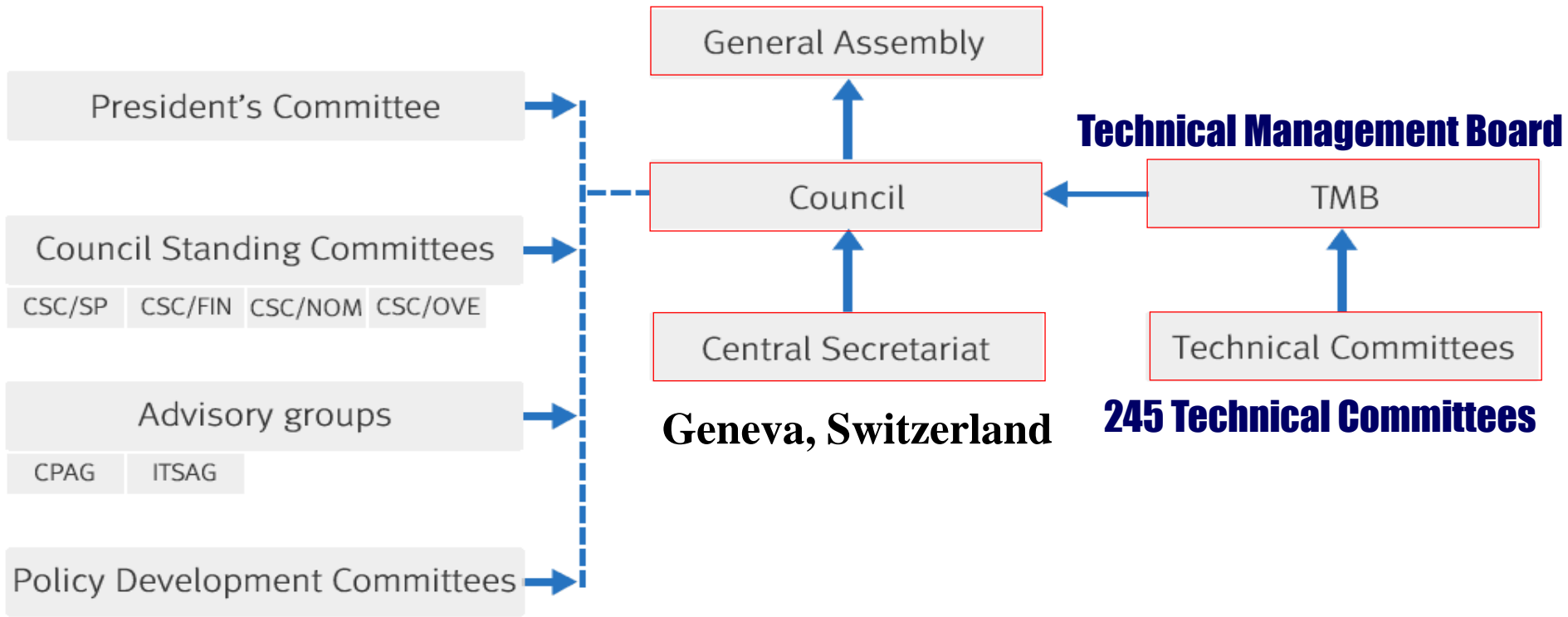
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ISO Governance Structure



- ❑ **ISO liaises with UN specialized agencies** that do technical harmonization or technical assistance, including the UN Economic and Social Council (ECOSOC).
- ❑ In total, ISO collaborates with over **700** international, regional and national organizations.

4C+ Principle for ISO Standards

CLEAR

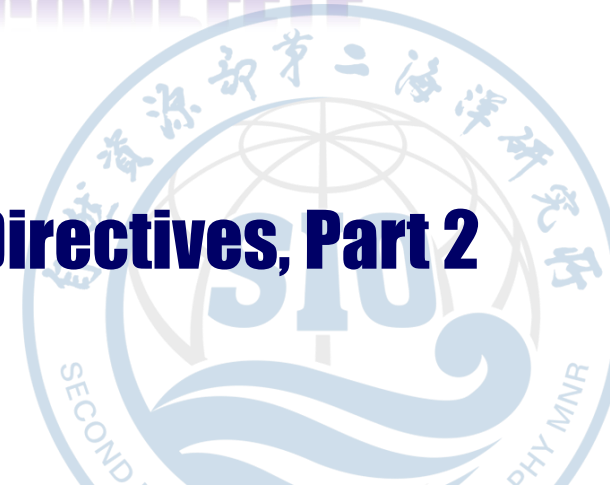
CONCISE

ISO standards ...

CONSISTENT

COMPLETE

In Addition, written in line with ISO/IEC Directives, Part 2



Work in Progress (7 steps)



Preliminary stage (00)

Proposal stage (10)

3 month ballot

Preparatory stage (20)

Consensus
Process

Committee stage (30)

Enquiry stage (40)

3 month ballot

Approval stage (50)

2 month ballot

MANDATORY

OPTIONAL

Publication stage (60)

Initiate a new proposal

- Include **00 - Preliminary stage (Abbr. PWI)** and **10 – Proposal stage (New Work Item Proposal, NP)**
- Put forward a new proposal in TC/SC Plenary meeting
- **NP vote** from TC/SC to activate for 3 months
- Acceptance by ***2/3 majority*** of P-members and at least 5 (or 4) of P-members have to agree to participate / provide experts

Preliminary stage (00)

Proposal stage (10)

Preparatory stage (20)

Committee stage (30)

Enquiry stage (40)

Approval stage (50)

Publication stage (60)

Prepare a Committee Draft

- ❑ Include **20 – Preparatory stage (WD)** and **30 - Committee Draft stage (CD)**
- ❑ A complete draft prepared and circulated in Working Group of TC/SC for comments and consensus
- ❑ A revised draft is circulated by secretary to all P & O members of TC/SC and Liaisons until consensus (2/3 majority if needed)

Preliminary
stage (00)

Proposal
stage (10)

Preparatory
stage (20)

Committee
stage (30)

Enquiry
stage (40)

Approval
stage (50)

Publication
stage (60)

Prepare a Draft ISO Standard

- Include **40 – Enquiry Stage (Draft International Standard, DIS)** and **50 – Approval Stage (First Draft International Standard, FDIS)**
- Circulation and first/second vote outside of the Committee to all ISO Member Bodies from ISO/CS for 3/2 months
- *Approval of 2/3 of the P members in the TC/SC that vote & not more than 1/4 of all votes cast are negative*

Preliminary
stage (00)

Proposal
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stage (40)

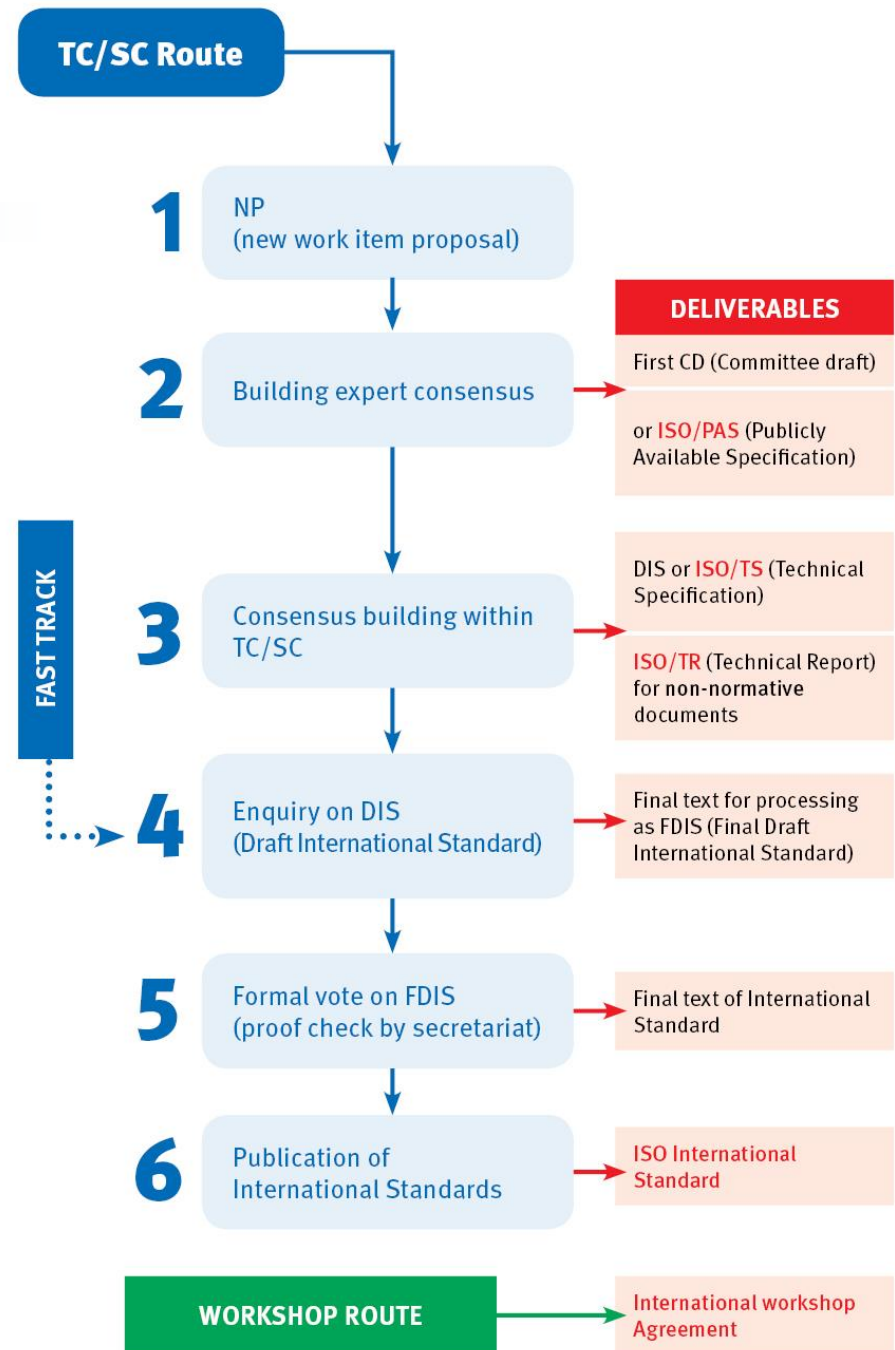
Approval
stage (50)

Publication
stage (60)

Key Principles in Standard Development

ISO standards:

- 1 respond to the needs in the market
- 2 based on global expert opinion
- 3 developed through a multi-stakeholder process
- 4 based on a consensus



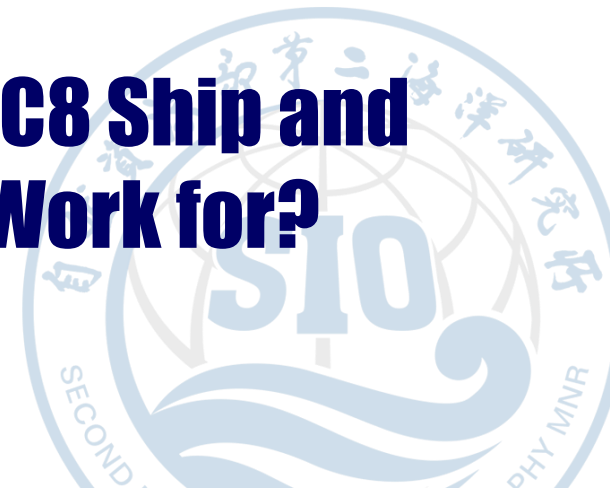
A photograph of a sailboat's white sail and rigging against a clear blue sky and a deep blue ocean with white-capped waves. The boat's wooden deck is visible in the lower-left corner.

Outline

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What does the ISO/TC8 Ship and Marine Technology Work for?



ISO/TC8: Ships and Marine Technology

ISO/TC8 was founded in 1947

331

**ISO standards
published**

134

**ISO standards
developed**

25

**Participating
members**

25

**Observing
members**

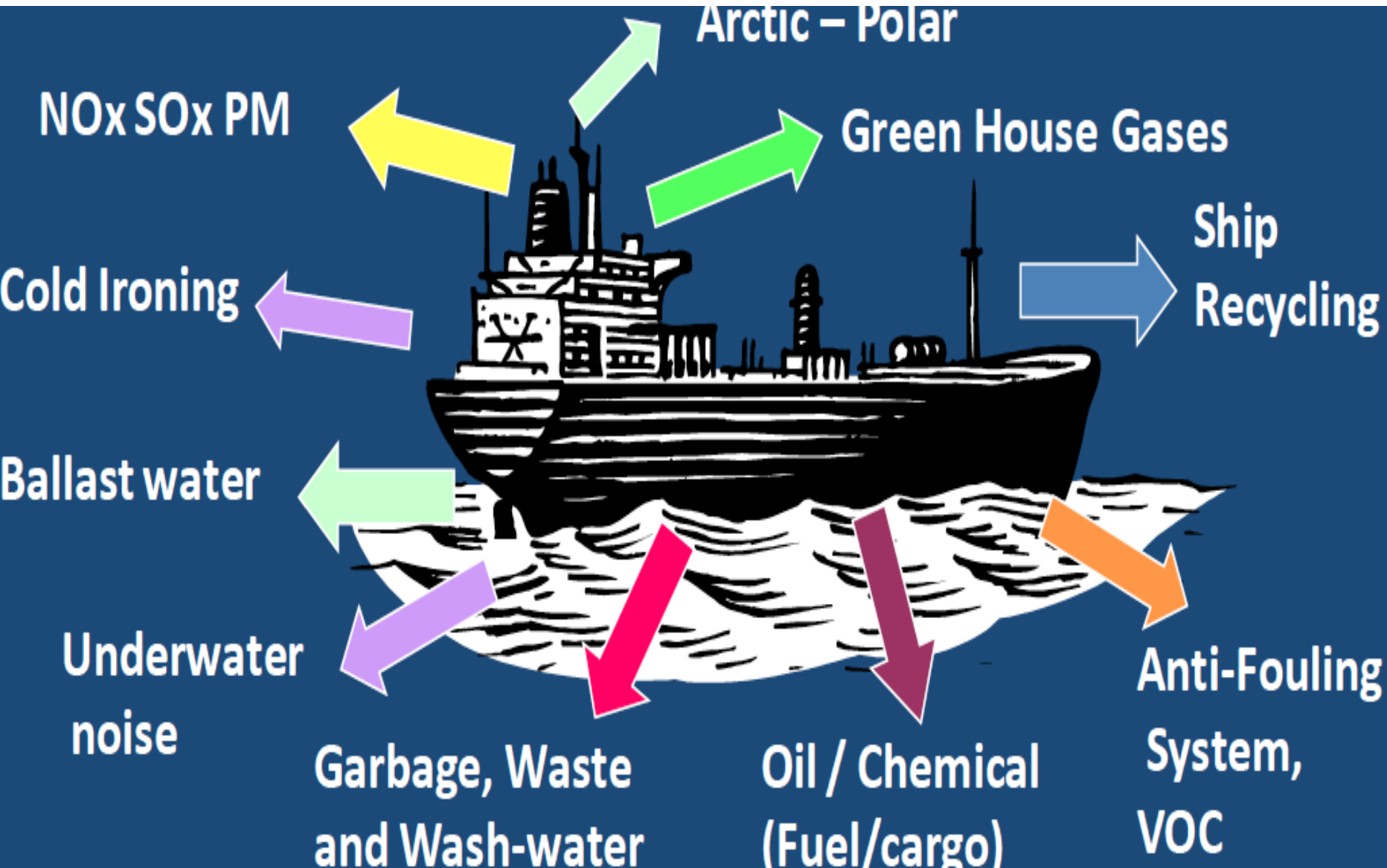
**General ships
to
Special vessels**

**Hull design
to
Ship moored**

**Power system
to
Intelligent
navigation**

**Safety
requirements
to
Environmental
responsibility**

Making Ship Industry More Environmental Friendly



Arctic - Polar

NOx SOx PM

Green House Gases

Ship
Recycling

Cold Ironing

Ballast water

Underwater
noise

Garbage, Waste
and Wash-water

Oil / Chemical
(Fuel/cargo)

Anti-Fouling
System,
VOC

ISO/TC8/SC13: Marine Technology, found in 2014

Standardization of test methods, operation, design, construction and logistics of equipment, systems, infrastructure and technology used for **observation, exploitation and protection** of the ocean and sea areas

Working Groups (4)

- 1 Submersibles
- 2 Ocean observation
- 3 Seawater desalination
- 4 Marine environment impact

P-Member (11)

- Canada
- China
- Germany
- Iran
- Japan
- Korea
- Panama
- Russian Federation
- Singapore
- United Kingdom
- United States

O-Member (6)

- Czech
- Indonesia
- Italy
- Netherlands
- Portugal
- Romania

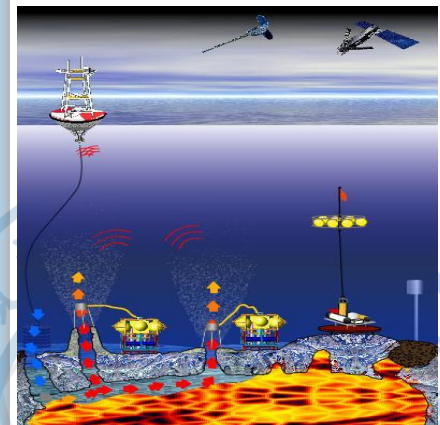
Ocean Observation - 1



- Satellite
- Buoy array
- Research vessels
- Submarine vessels: ROV, AUV, HOV
- Submarine and seafloor long-term observation system
- Drilling
- Seafloor Geophysics

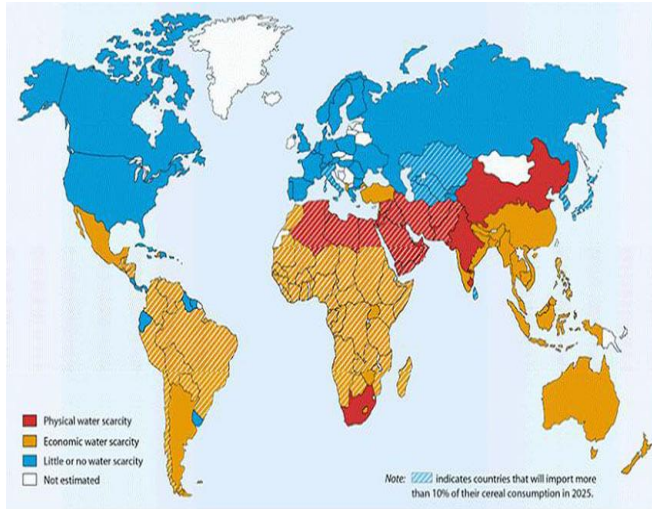


HOV "Jilong"



Seafloor observation system

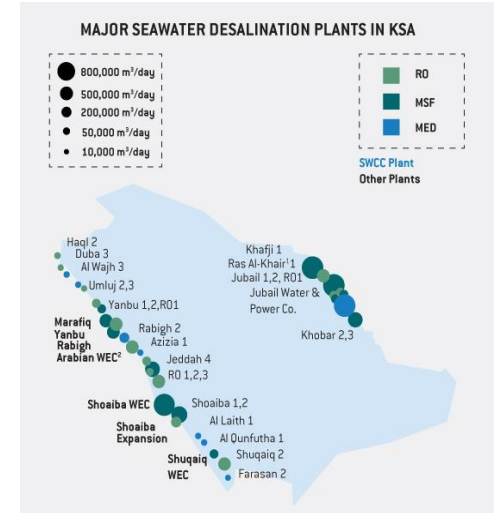
Seawater Desalination - 2



Distribution of global water shortage area

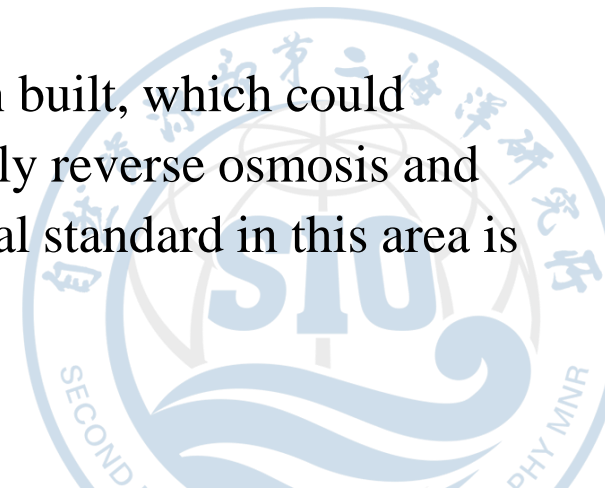


Hyflux Tianjin Dagang seawater desalination plant (100,000 T/d)

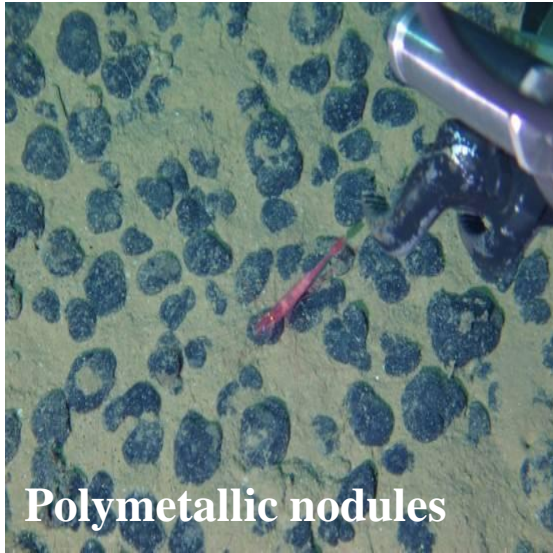


Distribution of seawater desalination plants in Saudi

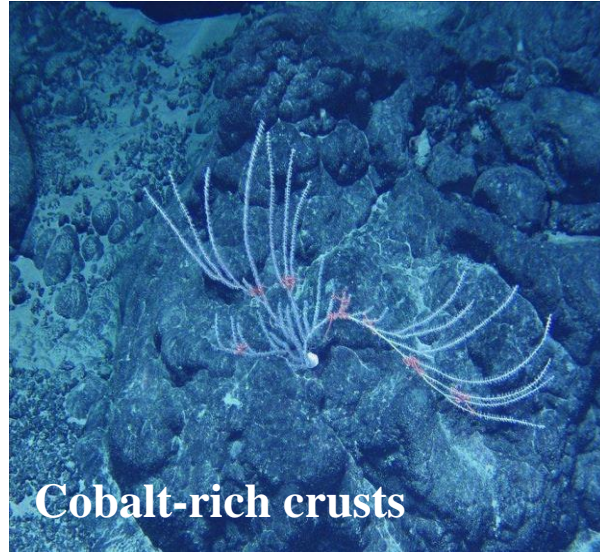
At present, 16,000 seawater desalination plants have been built, which could provide fresh water for industry and island life. Technically reverse osmosis and thermal method are mature. The development International standard in this area is just starting.



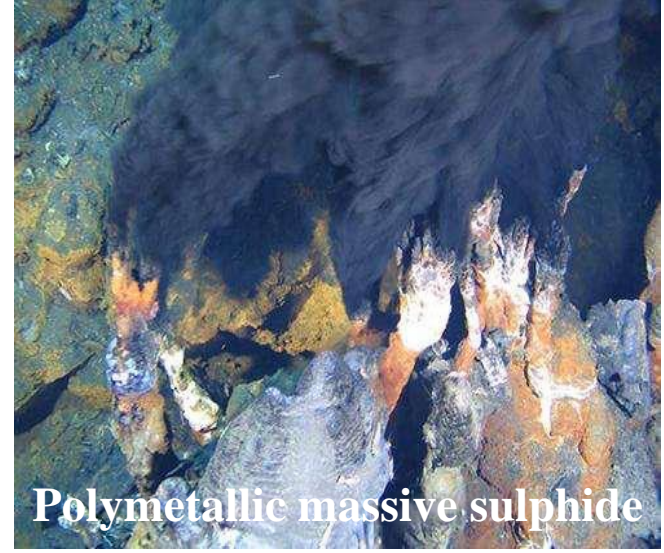
Deep Seabed Mining - 3



Polymetallic nodules



Cobalt-rich crusts



Polymetallic massive sulphide



ISA

- ❑ The deep seabed contains valuable mineral deposits. Due to the growing demand of metals and the depletion of some terrestrial reserves, three of those are of increasing commercial and strategic interest
- ❑ ISO/TC8/SC13 would like to do **technical assistance** for the ISA in relevant **international standards** to regulate the future deep seabed mining

Registered Work Items under ISO/TC8/SC13



- ISO/NP 22787 Marine technology – **Marine environment impact assessment (MEIA)** – Specification for biological survey in Seabed Area
- ISO/NP 22804 Ships and marine technology – General technical requirements of marine **Conductivity-Temperature-Depth (CTD) measuring instruments**

ISO/CD 22013
Marine sensor
performance

ISO/DIS 21173
Hydrostatic pressure test methods for
pressure structure of submersible

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ISO/AWI 21851 Standard design criteria of complex virtual instruments for ocean observation

ISO/AWI 23040 **Specification for marine sediments** in Seabed Area – Sediment interstitial biota survey

ISO/AWI 23446 Product water of seawater reverse osmosis desalination

ISO/AWI 23730 Marine technology – **Marine environment impact assessment (MEIA)** – General technical requirement on marine environment impact assessment

ISO/AWI 23731 Marine technology – **Marine environment impact assessment (MEIA)** – Long-term in-situ imaged-based surveys in deep sea environments

ISO/AWI 23732 Marine technology – **Marine environment impact assessment (MEIA)** – General protocol for observation of meiofaunal community

ISO/AWI 23734 Marine technology – **Marine environment impact assessment (MEIA)** – Surface water monitoring system during full-scale mining operation

Preliminary Thinking and Suggestions - 1

Online Browsing Platform (OBP)

ISO 14031:2013(en) Environmental management — Environmental performance evaluation

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- 4 Environmental performance evaluation**
 - 4.1 General overview
 - 4.2 Planning EPE (Plan)
 - 4.3 Using data and information (Do)
 - 4.4 Reviewing and improving EPE (Act)
- Annex A Supplemental guidance on EPE
 - A.1 General overview
 - A.2 Guidance on identifying views of interested parties in context of EPE
 - A.3 Supplemental guidance on selecting indicators for EPE
 - A.4 Examples of indicators for EPE
- Bibliography

Available in:

3.4 environmental performance evaluation element of an organization

Note 1 to entry: A.3.4

[SOURCE: ISO 14031:2013(en), 3.4]

3.5 environmental performance evaluation (EPE) element of an organization

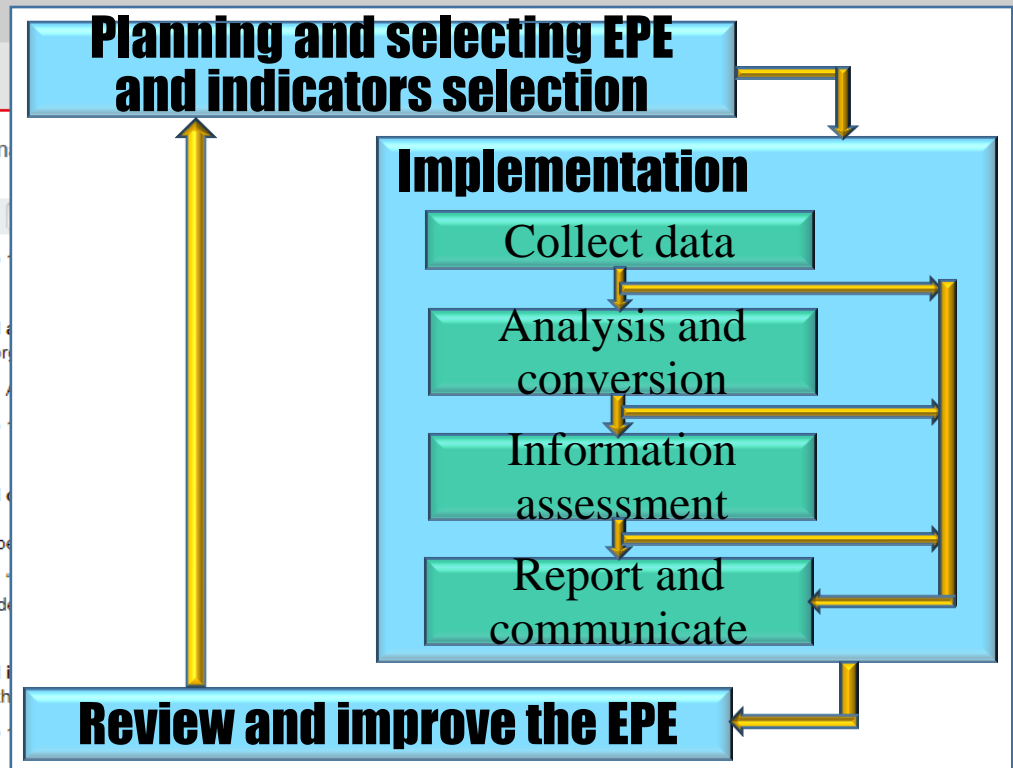
Note 1 to entry: A.3.5

[SOURCE: ISO 14031:2013(en), 3.5]

3.6 environmental performance evaluation (EPE) element of an organization

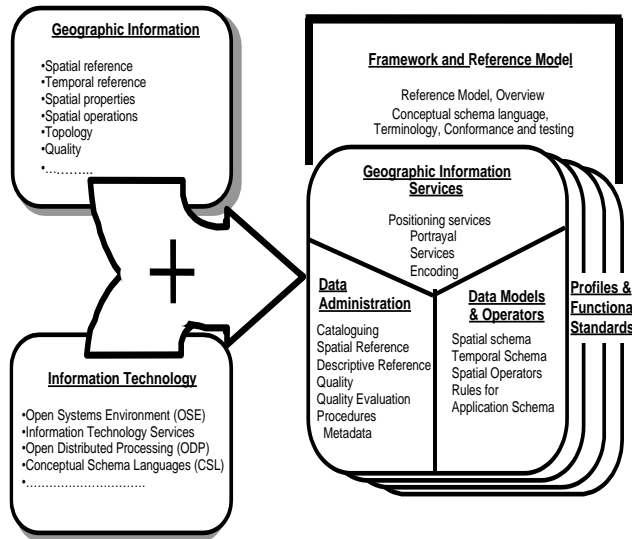
Note 1 to entry: A.3.6

[SOURCE: ISO 14031:2013(en), 3.6]

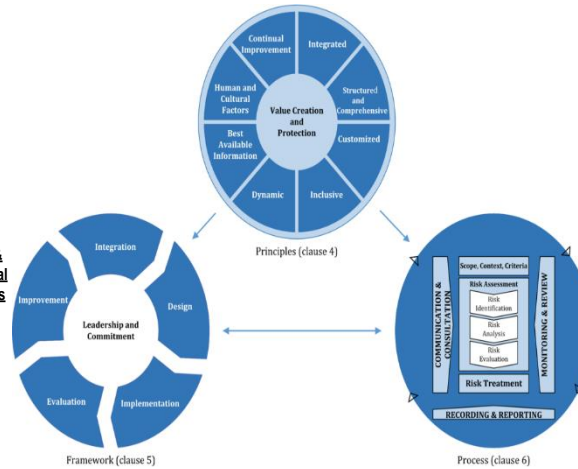


It is recommended that **the ISA standards refer to the existing international standards**, for example, **ISO 14031:2013** (environmental management: guidelines for environmental performance evaluation), which gives guidance on the design and use of environmental performance evaluation (EPE) within an organization.

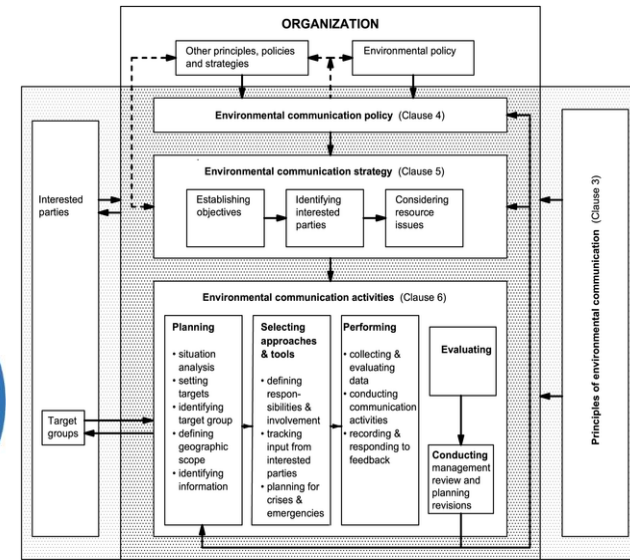
Preliminary Thinking and Suggestions - 2



ISO 19100
Geographic information



ISO 31000:2018
Risk Assessment



ISO 14063:2006
Environmental communication

ISO/TC8/SC13 is willing to provide **technical assistance** in the development of **international standards relating to marine technology** for exploitation and exploration of the deep seabed resources.



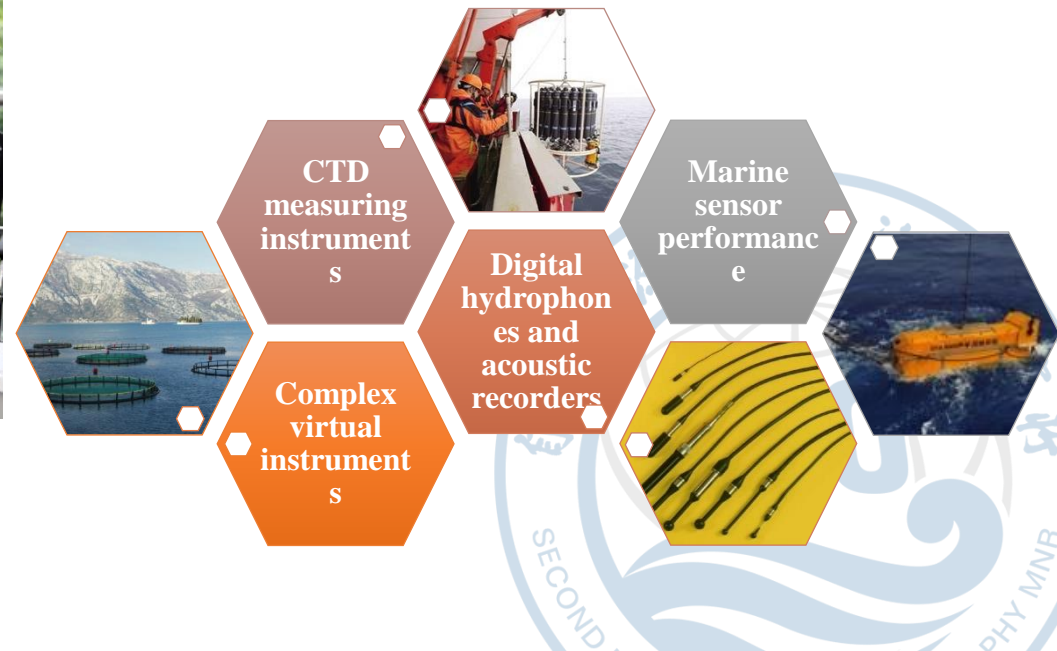
- ✓ **ISO** has established good example for liaison with IMO
- ✓ **ISO/TC8** develops, in cooperation with IMO, standards on materials, equipment and technologies to **reduce marine pollution**, as well as on **environmental protection procedures** to be used in the building and operation of vessels, and has > 100 items in its work programme in support of IMO
- ✓ **ISO/TC8** wish to establish **a liaison with ISA to promote standards for resource utilization and environmental protection** to respond to a need in the market, and to a request from industry or other stakeholders

Cooperation Create Future

ISO standard processes are professional, transparent and inclusive. We welcome more experts from different countries to **join TC8/SC13 Marine Technology** to promote the **development of standards for the ocean and seas.**



ISO President, Mr. John Walter visited the Secretariat of TC8/SC13 Marine Technology





Thank you!

