

Eurofleets+ Research Infrastructure (RI) management workshop

-

Research Vessel management, Part 1

Per W. Nieuwejaar

29 November 2022

Tallin, Estonia

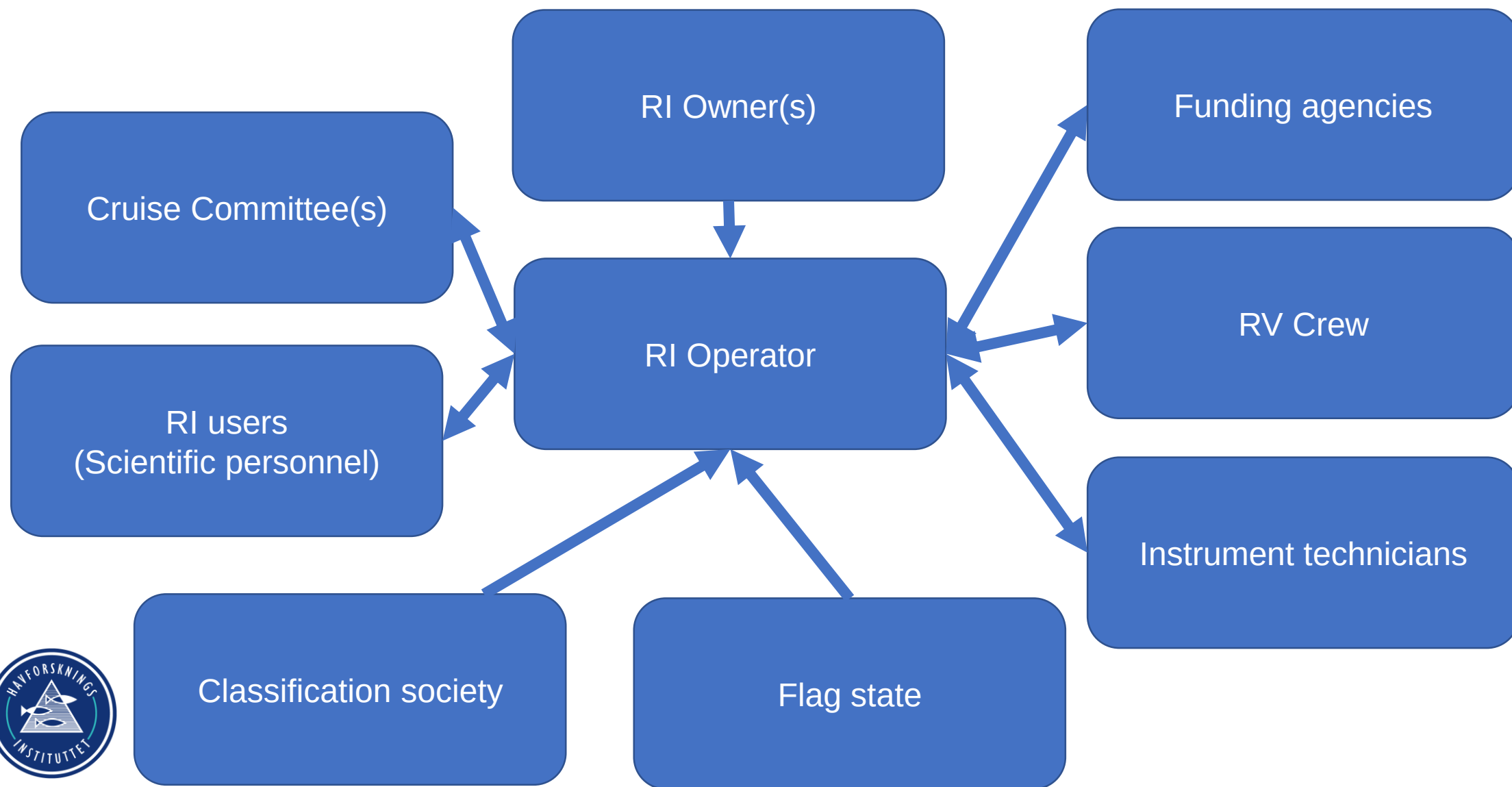


Topics

- Organization and stakeholders
- Funding
- IMO regulations
- STCW 95
- Quality management (ISO 9001) and Environmental safety management (ISO 14001)



Organization and stakeholders



Stakeholders – Flag states

A vessel must be registered in a country (Flag state) and must follow all relevant IMO, ILO and Flag state laws, rules and regulations.

Flag states are members of the UN International Maritime Organization (IMO) and the International Labour Organization (ILO). Their rules and regulations apply to all ships over 500 GRT, in addition to national rules and regulations issued by the Flag state National Maritime Administrations for all size vessels.

Relevant Flag state union agreements and other national labour laws also apply.

An international organization such as NATO, EU, United Nations (UN) etc cannot be a Flag state.



Stakeholders – Classification societies

All commercial vessels must belong to a classification society in order to be insured, while government owned (who are usually self-insured) do not need insurance and therefore can be member of a classification society on a volunteer basis.

Classification Societies classify and certify ships, often on behalf of the Flag state, establish and maintain technical standards for the construction and operation of ships, ensure that the ship's design and workings are in accordance with the standards set by their Class.

Most Research Vessels (RVs) are classified as cargo vessels and often in addition as Special Purpose Ships (SPS) in order to carry a large number of non-maritime personnel (scientists and technicians).



Stakeholders – RI Owners

Research Vessels (RVs) are usually owned by a public entity, such as a university or research institute, but in some cases they are owned by private companies and leased to a university or research institute on long term contracts.

In some countries short term and/or multi year vessel charter agreements with commercial vessels and/or RVs are also used to augment their cruise activity with their own RVs.

The RV owners, which is typically a government ministry, a university or a research institute, are responsible for the long term funding for new vessels, major upgrade of existing vessels, in addition to secure a reasonable level of funding for RV operations incl. maintenance.

The level of funding varies between nations and institutions, where some are fully funded and others have to seek income from charter, EU projects etc to cover the annual cost of manning, operation and maintenance of the vessel(s).

Scientific equipment and instruments are mostly owned by the universities or research institutes themselves. The funding for procurement, operation and upgrade of scientific equipment and instruments are usually the owner institution's own responsibility.



Stakeholders – Funding agencies

Funding agencies for RV operations (manning, fuel, provisions, maintenance, harbour fees etc) can be a combination of several sources, such as:

- RI owner(s)
- Externally funded projects for EU, research foundations or commercial companies
- Other research institutions etc who charter the vessel(s) for one or multiple cruises, usually for an agreed day-rate that includes fuel or where fuel is charged separately.

For example has the three Eurofleets projects (Eurofleets, Eurfleets2 and Eurofleets+) provided the European RV fleet with several million Euros to cover Transnational Access (TA) cruises from 2009 through 2023.



Stakeholders - Internal

- Cruise committee(s) – The programming of the Research Vessels (RVs) and Large Exchangeable Instruments (LEXIs) are usually done on an annual or multiyear basis by cruise committees with representatives for involved monitoring and research programs, and the RI operator(s).
- RI users – Each cruise has to be planned in detail in a cooperation between the Principal Investigator (PI) and his/her science party, the RI operator, the RV crew and the Instrument technicians involved in the cruise.
- RV Crew – The RV operator must have an employment and salaries agreement with the RV crew labour unions and make sure that the annual cruise programme(s) are in line with the agreed work and leave periods, e.g X number of days/weeks on board followed by a equivalent time period of leave.
- Instrument technicians – Instrument technicians often do not follow the same work/leave system(s) as the RV crew(s), but are scheduled to participate in cruises where their particular skills and/or LEXIs are planned to be used. They therefore often have individual work/leave schedules that must be iaw governing laws and labour agreements.



Legal and profession framework - Sources

- International Maritime Organization (IMO)
- International Labour Organization (ILO)
- National Maritime Authorities rules and regulations
- National laws, in particular those governing ship safety and security < and maritime labour
- Classification society rules
- International Standardization Organization (ISO)



Guiding documents

- Safety Of Life At Sea (SOLAS)
- International Safety Management (ISM) Code
- International Ship and Port Security (ISPS) Code
- Maritime Labour Convention (MLC)
- Shipboard Oil Pollution Emergency Plan (SOPEP)
- Polar Code
- Standards of Training, Certification and Watchkeeping for Seafarers (STCW)
- National Ship safety and security Acts
- Ship workers Act
- ISO 9001 (Quality management)
- ISO 14001 (Environmental protection management)
- Code of Conduct for Marine Scientific Research Vessels
(International Research Ship Operators – IRSO)



International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code)

- **The ISM Code is:**
A management systems model designed to encourage safety and pollution prevention.
- **The objectives of the Code are to:**
Ensure safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment, in particular to the marine environment, and to property.
- **7 elements of the ISM code:**
 1. Who is the Company as per ISM code
 2. Company's responsibilities
 3. Internal Audits. Effective internal audits is the main dividing line between a good ship management company and a bad one.
 4. Certificates as per ISM Code. Document Of Compliance (DOC) for the company and Safety Management System (SMS) certificate for ship.
 5. Designated Person Ashore (DPA)
 6. Observations, Non-conformity and Major Non-conformity
 7. Master's review



Safety Of Life At Sea (SOLAS)

- The SOLAS Convention in its successive forms is generally regarded as the most important of all international treaties concerning the safety of merchant ships.

The first version was adopted in 1914, in response to the Titanic disaster, the second in 1929, the third in 1948, and the fourth in 1960. The current version is from 1974 with numerous amendments.

- The main objective of the SOLAS Convention is to specify minimum standards for the construction, equipment and operation of ships, compatible with their safety.

Flag States are responsible for ensuring that ships under their flag comply with its requirements, and a number of certificates are prescribed in the Convention as proof that this has been done.

Control provisions also allow Contracting Governments to inspect ships of other Contracting States if there are clear grounds for believing that the ship and its equipment do not substantially comply with the requirements of the Convention - this procedure is known as Port State control.



SOLAS chapters

- Construction - Subdivision and stability, machinery and electrical installations
- Fire protection, fire detection and fire extinction
- Life-saving appliances and arrangements
- Radio communications
- Safety of navigation
- Carriage of Cargoes
- Carriage of dangerous goods
- Nuclear ships
- Management for the Safe Operation of Ships
- Safety measures for high-speed craft
- Special measures to enhance maritime safety
- Special measures to enhance maritime security
- Additional safety measures for bulk carriers
- Verification of compliance
- Safety measures for ships operating in polar waters



International Ship and Port Security (ISPS) Code

- The ISPS Code provides a framework through which ships and port facilities can co-operate to detect and deter acts which pose a threat to maritime security.
- Having entered into force on 1 July 2004, the ISPS Code has since formed the basis for a comprehensive mandatory security regime for international shipping.
- ISPS Code requirements includes:
 - Ship security assessments, ship security plans, Ship Security Officers (SSO), Company Security Officers (CSO) and certain onboard equipment.
 - For port facilities; port facility security assessments and plans, port facility security officers and certain security equipment.
 - Security level 1 - Normal, the level at which the ship or port facility normally operates, and minimum appropriate protective security measures shall be maintained at all times.
 - Security level 2 - Heightened, the level applying for as long as there is a heightened risk of a security incident and appropriate additional protective security measures shall be maintained.
 - Security level 3 - Should be an exceptional measure applying only when there is credible information that a security incident is probable or imminent.



Maritime Labour Convention (MLC)

- The MLC is a joint IMO and ILO convention with the aim to ensure comprehensive worldwide protection of the rights of seafarers;
To establish a level playing field for countries and shipowners committed to providing decent working and living conditions for seafarers, protecting them from unfair competition from substandard ships.
- In some countries MLC is not fully applicable to non-maritime personnel on board RVs, such as the science party and instrument technicians, e.g with regards to employment regulations, employment record document, cabin size, single cabin, medical care, dental care etc.
- MLC regulations:
 - Minimum Requirements for seafarers to work on ships.
 - Conditions of Employment.
 - Accommodation, Recreation, Food and Catering.
 - Health Protection, Medical Care, Welfare and Social Security Protection.
 - Compliance and Enforcement.
- MLC certificates
A current valid maritime labour certificate and declaration of maritime labour compliance, accompanied by an English-language translation where it is not in English, shall be carried on the ship and a copy shall be posted in a conspicuous place on board where it is available to the seafarers.



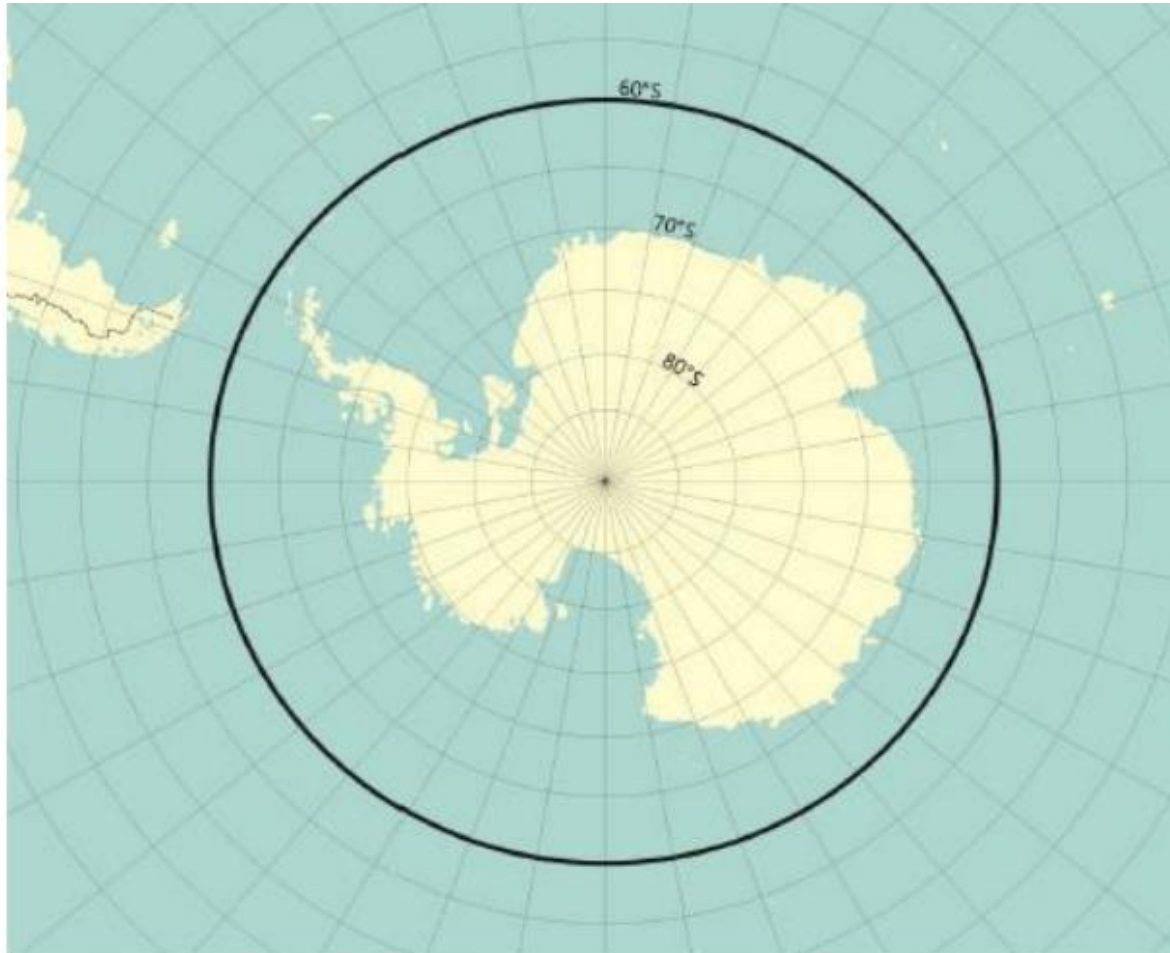
Shipboard Oil Pollution Emergency Plan (SOPEP)

- The Shipboard Oil Pollution Emergency Plan (SOPEP), required for all ship over 400 Gross Register Tons (GRT), is a prevention plan intended to eliminate release of hazardous materials into the marine environment, and to respond when such releases do happen.
- Every vessel is required to have a tailored shipboard oil pollution emergency plan which includes the requirements of MARPOL 73/78, Annex I, Reg 37.



Polar Code areas

Antarctica: South of 60°S



Arctic: Area inside the black line



Jan Mayen and Bjørnøya are two of the southernmost positions in the Barents Sea



WHAT DOES THE POLAR CODE MEAN FOR SHIP SAFETY?

EQUIPMENT



WINDOWS ON BRIDGE
Means to clear melted ice, freezing rain, snow, mist, spray and condensation



LIFEBOATS
All lifeboats to be partially or totally enclosed type



CLOTHING I
Adequate thermal protection for all persons on board



CLOTHING II
On passenger ships, an immersion suit or a thermal protective aid for each person on board



ICE REMOVAL
Special equipment for ice removal: such as electrical and pneumatic devices, special tools such as axes or wooden clubs



FIRE SAFETY
Extinguishing equipment operable in cold temperatures; protect from ice; suitable for persons wearing bulky and cumbersome cold weather gear



OPERATIONS & MANNING



NAVIGATION
Receive information about ice conditions



CERTIFICATE & MANUAL
Required to have on board a Polar Ship Certificate and the ship's Polar Water Operational Manual



TRAINING
Masters, chief mates and officers in charge of a navigational watch must have completed appropriate basic training (for open-water operations), and advanced training for other waters, including ice

DESIGN & CONSTRUCTION



SHIP CATEGORIES
Three categories of ship which may operate in Polar Waters, based on:
A) medium first-year ice
B) thin first-year ice
C) open waters/ice conditions less severe than A and B



MATERIALS
Ships intended to operate in low air temperature must be constructed with materials suitable for operation at the ships polar service temperature



INTACT STABILITY
Sufficient stability in intact condition when subject to ice accretion and the stability calculations must take into account the icing allowance



STRUCTURE
In ice strengthened ships, the structure of the ship must be able to resist both global and local structural loads

BACKGROUND INFO

❄️ THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WAS ADOPTED NOVEMBER 2014 BY THE IMO MARITIME SAFETY COMMITTEE

❄️ IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS

❄️ THE AIM IS TO PROVIDE FOR SAFE SHIP OPERATION AND THE PROTECTION OF THE POLAR ENVIRONMENT BY ADDRESSING RISKS PRESENT IN POLAR WATERS AND NOT ADEQUATELY MITIGATED BY OTHER INSTRUMENTS



HOW THE **POLAR** CODE PROTECTS THE ENVIRONMENT

OIL



DISCHARGES

Discharge into the sea of oil or oily mixtures from any ship is prohibited



STRUCTURE

Double hull and double bottom required for all oil tankers, including those less than 5,000dwt (A/B ships constructed on or after 1 January 2017)



HEAVY FUEL OIL

Heavy fuel oil is banned in the Antarctic (under MARPOL). Ships are encouraged not to use or carry heavy fuel oil in the Arctic



LUBRICANTS

Consider using non-toxic biodegradable lubricants or water-based systems in lubricated components outside the underwater hull with direct seawater interfaces

INVASIVE SPECIES



INVASIVE AQUATIC SPECIES

Measures to be taken to minimize the risk of invasive aquatic species through ships' ballast water and biofouling

SEWAGE



DISCHARGES I

No discharge of sewage in polar waters allowed (except under specific circumstances)



TREATMENT PLANTS

Discharge is permitted if ship has an approved sewage treatment plant, and discharges treated sewage as far as practicable from the nearest land, any fast ice, ice shelf, or areas of specified ice concentration



DISCHARGES II

- Sewage not comminuted or disinfected can be discharged at a distance of more than 12nm from any ice shelf or fast ice
- Comminuted and disinfected sewage can be discharged more than 3nm from any ice shelf or fast ice

GARBAGE



PLASTICS

All disposal of plastics prohibited (under MARPOL)



FOOD WASTES I

Discharge of food wastes onto the ice is prohibited



FOOD WASTES II

Food wastes which have been comminuted or ground (no greater than 25mm) can be discharged only when ship is not less than 12nm from the nearest land, nearest ice shelf, or nearest fast ice



ANIMAL CARCASSES

Discharge of animal carcasses is prohibited



CARGO RESIDUES

Cargo residues, cleaning agents or additives in hold washing water may only be discharged if: they are not harmful to the marine environment; both departure and destination ports are within Arctic waters; and there are no adequate reception facilities at those ports. The same requirements apply to Antarctic area under MARPOL

CHEMICALS



DISCHARGES

Discharge of noxious liquid substances (NLS) or mixtures containing NLS is prohibited in polar waters

BACKGROUND INFO

- THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WILL ENTER INTO FORCE ON 1 JANUARY 2017
- IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS: ADDITIONAL TO EXISTING MARPOL REQUIREMENTS
- IT PROVIDES FOR SAFE SHIP OPERATION AND PROTECTS THE ENVIRONMENT BY ADDRESSING THE UNIQUE RISKS PRESENT IN POLAR WATERS BUT NOT COVERED BY OTHER INSTRUMENTS

DEFINITIONS



SHIP CATEGORIES

Three categories of ship designed to operate in polar waters in:

- A) at least medium first-year ice
- B) at least thin first-year ice
- C) open waters/ice conditions less severe than A and B



FAST ICE: Sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs

ICE SHELF: A floating ice sheet of considerable thickness showing 2 to 50m or more above sea-level, attached to the coast



Standards of Training, Certification and Watchkeeping for Seafarers (STCW)

- The **1978 STCW Convention** was the first to establish basic requirements on training, certification and watchkeeping for seafarers on an international level.
Previously the standards of training, certification and watchkeeping of officers and ratings were established by individual governments, usually without reference to practices in other countries. As a result, standards and procedures varied widely, even though shipping is the most international of all industries.
- The Convention prescribes minimum standards relating to training, certification and watchkeeping for seafarers which countries are obliged to meet or exceed.
- **STCW Convention chapters**
 - Chapter I: General provisions
 - Chapter II: Master and deck department
 - Chapter III: Engine department
 - Chapter IV: Radiocommunication and radio personnel
 - Chapter V: Special training requirements for personnel on certain types of ships
 - Chapter VI: Emergency, occupational safety, medical care and survival functions
 - Chapter VII: Alternative certification
 - Chapter VIII: Watchkeeping



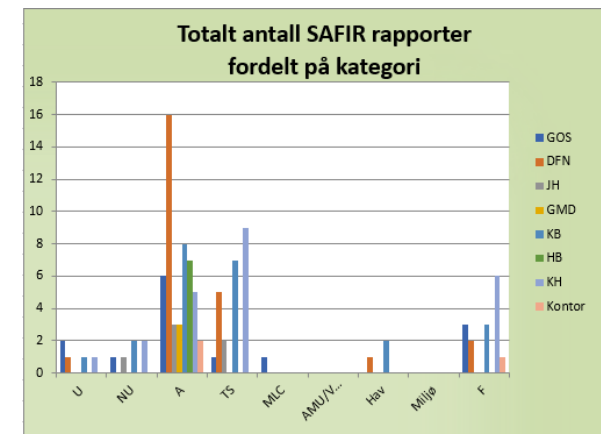
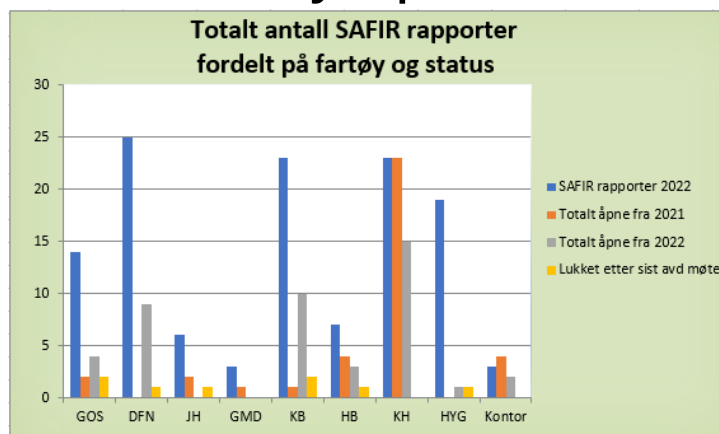
Integrated Safety, Quality and Environmental management system

- Since development, implementation and use of the ISM code, ISO 9000 (Quality) and ISO 14000 (Environment) are based on the same methodology and cover different, and to some extent overlapping, tasks that must be documented, implemented and revised on board every research vessel (maritime and science), it can be beneficial to combine these three management systems into one.
- Some classification societies can be of help in developing such integrated management systems tailored to each RV in the fleet.
- IMR has done this in cooperation with DNV with great success.



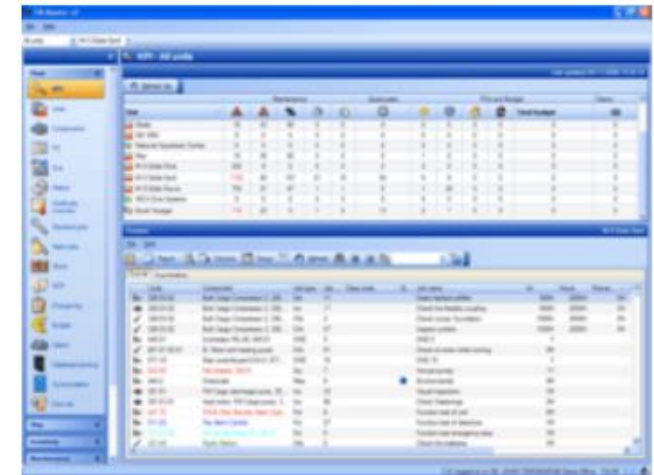
Safety and Inspection Report - SAFIR

- A part of the Safety Management System (SMS) that is required in order to be ISM-certified is the reporting of accidents, near-accidents and incidents that could potentially lead to an accident for analysis and learning. This set of procedures, forms and statistics is often named SAFIR for short.
- Each SAFIR shall be handled, analysed and acted on by the vessel operator and all vessels in the fleets shall be informed about each SAFIR and what action is required to minimize or eliminate the risk associated with the SAFIR.
- The vessel operator shall look for similarities in the SAFIRs to search for trends and commonalities that require a fleet-wide approach.
- In all steps of the SAFIR procedure it is the root cause that needs to be identified and acted on, not the symptoms!



Web-based planned maintenance system for ships

- Most vessel operators are using a web-based maintenance planning and reporting system on board the vessels and in the vessel management office.
- This tool can be used by both the crew for shiptechnical equipment and the instrument technicians for the fixed scientific instruments on board and also for mobile equipment and instruments with regards to inspections, maintenance, yard planning, reporting and stock management .



Union agreements

- The RV operator must ensure that all employees, shore staff, maritime crew and instrument technicians have employment conditions that cover their personal benefits (salaries, pension, insurance etc) and that their work arrangements (work periods, leave, vacations, working hours etc) are in accordance with national rules and regulations and at the same time that the services provided by the RV Fleet to the users of the vessels and Large EXchangeable Instruments (LEXIs) allows the research cruises to be executed in a costeffective manner.
- Often these agreements are negotiated with the national trade unions and it is very clever to have a good working relationship with both their central and local representatives based on mutual respect and understanding!



Questions?

