



ISM Code & Auditing Techniques

EMSA Training – Module 1 & 2

The Trainers

Luis VANRELL

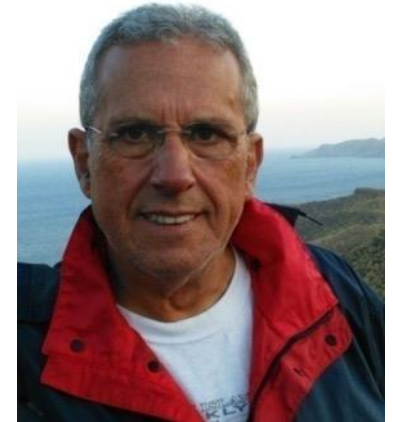
Master Mariner (MSc)

Former: Superintendent / Company Inspector /
Maritime Consultant / Class Surveyor

ISM / ISPS / ISO 9001, 14001, 50001 Lead Auditor

MLC Inspector

Trainer to DNV GL Academy



Peter WERNER

Master Mariner (MSc)

Former: Project Manager for implementation of
ISM, ISPS, MLC 2006, ISO Standards, DPA / CSO
Auditor ISM/ISPS/MLC + ISO 9001/14001/50001
Consultant for Integrated management systems,
process optimization, cyber security, innovation &
change management

Senior Trainer DNV GL for DPA Course

The participants



Name
Company
Position / Duty
Experience with the Topic
Expectations about this Course

Please introduce
yourself



Organisation and Safety Matters

OneDrive:










Course documentation – folder:

- 01_General Information_Documents
- 02_Presentation (Handout pdf)
- 03_Activities
- 04_Documentation
- 05_Supporting Documents
(Circulars, Guidelines, etc.)

Emergency number
(in case of re-entry)
+34 679 991 118
+49 157 92339318

Practical information

 Remote Access	 Other Issues	 Questions	 Breaks	 Test	 Course Assessment	 Course Certificate
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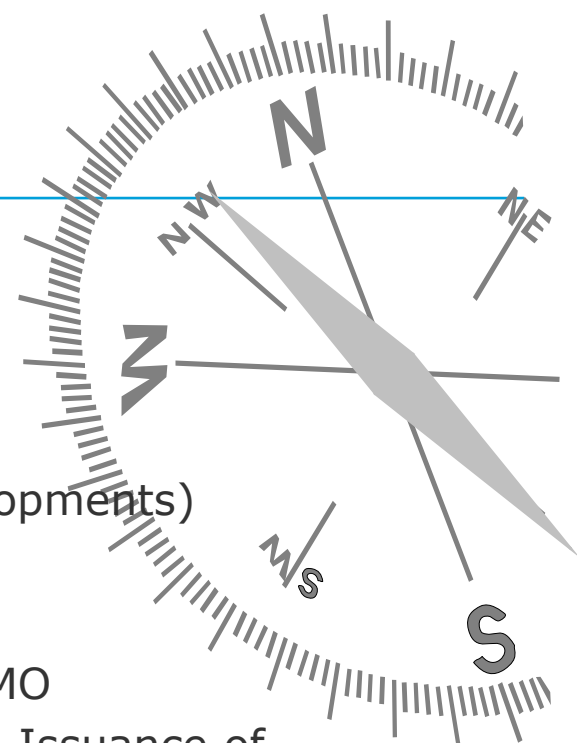
EMSA - ISM Code & Auditing Techniques

Objectives

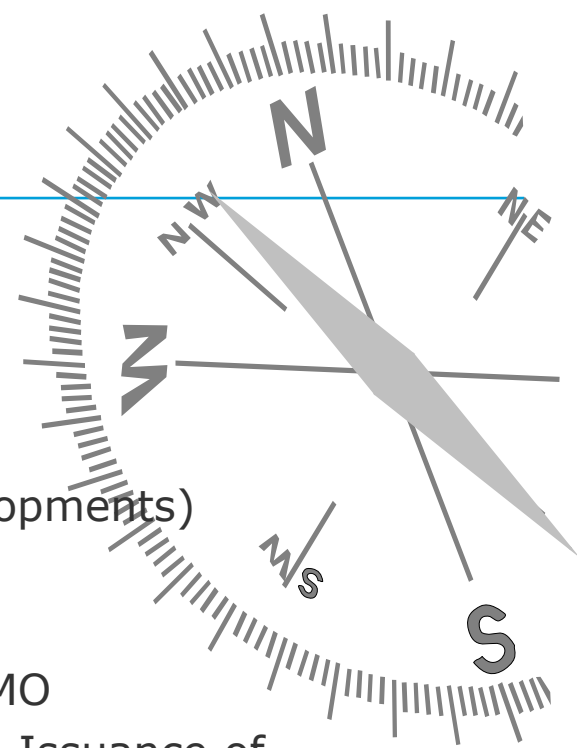
- To enhance participants knowledge and understanding of the ISM Code and Safety Management Systems (SMS)
- To review the background and requirements of the ISM Code
- To become more familiar with different types of flag State audits and internal audits
- To develop a practical approach to auditing techniques



Course Modules



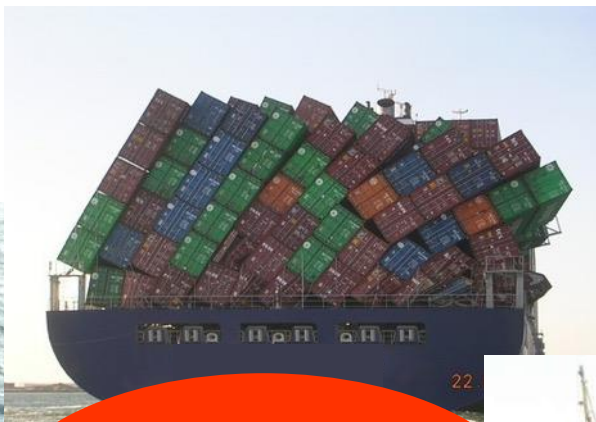
- Module 1 – Evolution of Management Systems and the ISM Code
- Module 2 – ISM Code Requirements (incl. latest developments)
- Module 3 – Stakeholders in Shipboard Operations
- Module 4 – Knowledge of Shipboard Operations
- Module 5 – The ISM Code and the EC Regulations & IMO
- Module 6 – Types and Scopes of Flag State Audits and Issuance of Certificates
- Module 7 – The Auditor
- Module 8 – Audit Planning and Organization
- Module 9 – Audit Conduction
- Module 10 – Audit Reporting & Follow-up
- Module 11 – Role Play



➔ **Module 1 – Evolution of Management Systems and the ISM Code**

- Module 2 – ISM Code Requirements (incl. latest developments)
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Background to the ISM Code



Why ISM ?

Herald of Free Enterprise, 1987



Exxon Valdez, 1989



Amoco Cadiz, 1978



Scandinavian Star, 1990



**Development of Guidelines,
Rules and Regulations on the
basis of maritime accidents**

**Result: Change of
international
Rules and Regulations**

Why ISM ?

Amoco Cadiz, 16 MAR 1978

- This tanker loaded with 250 000 m³ of crude oil ran aground in Portsall rocks Brittany. During her sea passage from Persian Gulf to Rotterdam, she encountered stormy weather in the Channel entrance .
- At around 09h45, a heavy wave hit the ship's rudder, and it was found that it was no longer responding to the helm. No repair succeeded.
- At 10h20 message "No longer manoeuvrable" sent to other ships.
- At 11H20. call for tug assistance .
- At 11h28 German tug boat "Pacific" offered assistance under a Lloyds's Open Form.
- At 12h20 the tug boat arrived on the scene but first tow line in place only at 14h00 and broke at 16h15.
- "Amoco Cadiz" dropped her anchor trying to halt her drift.
- At 20H55, another tow line in place after unsuccessful attempts.



Why ISM ? (Cont.)

Amoco Cadiz, 16 MAR 1978

- But the tanker continued to drift towards the coast, due to her huge mass and Force 10 storm winds
- At 21h04 the "Amoco Cadiz" went aground flooding its engine room & again at 21h39, this time ripping the hull and starting the oil spill.
- Her crew was rescued by French Naval Aviation helicopters at midnight, but Captain and one officer remained on board until 05h00 the next morning.
- At 10h00 the 17/03/1978 the vessel broke in 2 parts; releasing her entire cargo of 1,6 millions barrels of oil, and broke again 11 days later from the buffeting of high stormy seas.
- The wreckage was later completely destroyed with depth charges by the French Navy.



Why ISM ? (Cont.)

Herald of Free Enterprise, 06 MAR 1987



- This Ro-Ro passenger ferry capsized few moments after leaving her berth in Zeebrugge (Belgium)
- The ship left the harbour with her bow door open. Due to the vessel list following manoeuvring with high speed the sea water immediately flooded the decks, & within minutes she was lying on her side in shallow water, killing 193 persons.
- This modern 8 decks car & passenger ferry was designed for rapid loading and unloading on the competitive cross channel route. There were no watertight compartments.
- The **immediate cause** of capsizing was found to be negligence of the assistant boatswain asleep in his cabin when he should have been closing the door.
- But the official inquiry placed more blame on his supervisors and **a general culture of poor communication in the ferry company P&O European Ferries.**

Why ISM ? (Cont.)

**Herald of Free Enterprise,
06 MAR 1987**



- Since the disaster, improvements have been made to the design of RoRo vessels with watertight ramps, indicators showing the **position of the bow doors and the banning of undivided decks**.
- Due to **lack of accountability at various levels of shore management**, shore management did not assume responsibility to deal with problems reported by the Master, No corrective / preventive actions have been initiated
- Following requirements were laid down in the UK Merchant Shipping Regulations (1988) Applicable to all UK passenger ships on short sea trade
 - to carry an **"Operations Book"** containing instructions and information for the safe and efficient operation
 - owners to nominate a person to oversee the operation of their ships the person (known as **"Designated Person"**) to ensure that proper provisions were made in order to comply with the operations book

Why ISM ? (Cont.)

EXXON Valdez 24 MAR 1989



- The EXXON Valdez oil spill occurred in Prince sound , Alaska, on March 24, 1989, when the oil tanker, bound for Long Beach, California, struck Prince William Sound's Bligh Reef at 12h04 a.m. local time and spilled 11,000,000 to 38,000,000 gallons of crude oil, over the next few days.
- It is considered to be one of the **most devastating human-caused environmental disasters**.
- Prince William Sound's remote location, accessible only by helicopter, plane, or boat, made government and industry response efforts difficult and severely taxed existing response plans.
- The region is a habitat for salmon, sea otters, seals and seabirds. The oil, originally extracted at the Prudhoe Bay Oil field, eventually covered 1,300 miles (2,100 km) of coastline, and 11,000 square miles (28,000 km²) of ocean.

Why ISM ? (Cont.)

EXXON Valdez 24 MAR 1989



Multiple factors have been identified as contributing to the incident:

- Exxon Shipping Company **failed to supervise the Master** and **provide a rested and sufficient** crew for EXXON Valdez.
- The third mate failed to properly maneuver the vessel, possibly due to **fatigue or excessive workload**.
- Exxon Shipping Company failed to **properly maintain the Raytheon Collision Avoidance System** (RAYCAS) radar, which, if functional, would have indicated to the third mate an impending collision with the Bligh Reef by detecting the "radar reflector", placed on the next rock inland from Bligh Reef for the purpose of keeping ships on course
- Captain Joseph Hazelwood, who **was widely reported to have been drinking heavily that night**, was not at the controls when the ship struck the reef.
- However, as the senior officer, he was on conning of the ship.

Why ISM ? (Cont.)

EXXON Valdez 24 MAR 1989

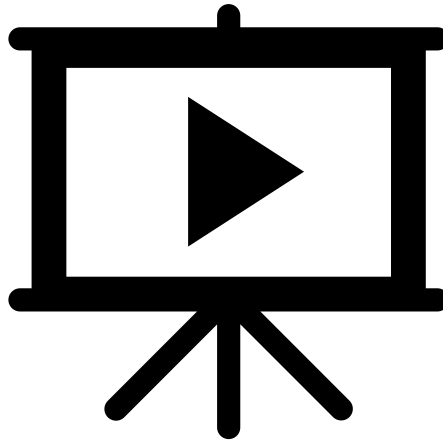


Other factors which contributed to the oil spill,

- Ships were not informed that the previous practice of the Coast Guard tracking ships out to Bligh Reef had ceased.
- The oil industry promised, but never installed, state-of-the-art iceberg monitoring equipment.
- EXXON VALDEZ was sailing outside the normal sea lane to avoid small icebergs thought to be in the area.
- The 1989 tanker crew was **half the size of the 1987 crew, worked 12- to 14-hour shifts, plus overtime**. The crew was rushing to leave Valdez with a load of oil.
- Coast Guard vessel inspections in Valdez were not performed, and the number of staff was reduced.
- Lack of available equipment and personnel hampered the spill cleanup.

Why ISM ? (Cont.)

Scandinavian Star, 07 APR 1990



Why ISM ? (Cont.)

Scandinavian Star, 07 APR 1990



- M/S Massalia was built by Dubigeon-Normandie S.A. in 1971 and delivered to Compagnie Paquet
- In 1984 she was owned by a number of companies and named "Stena Baltica", "Island Fiesta" and finally "Scandinavian Star", a name given to her by Scandinavian World Cruises who chartered the ship for cruises between Europe, USA & Mexico.
- In 1990, the Scandinavian Star was sold to Vognmandsruten and put into service on DA-NO Linjen's route between Norway, and Denmark. As the ship had been converted from a casino ship to a passenger ferry, a new crew needed to be trained and were given just ten days to learn new responsibilities
- During the night of 7 April 1990, at about 2 a.m. local time, fire broke out and was discovered by a passenger and was brought to the attention of the receptionist.

Why ISM ? (Cont.)

Scandinavian Star, 07 APR 1990



- The fire spread from deck 3 to 4 stopping at deck 5. As the stairwell and ceilings acted as chimneys for the fire to spread. Although the bulkheads were made of steel structure with asbestos wall boards, a **melamine resin laminate** was used as a decorative covering and **proved extremely flammable** in subsequent testing, spreading fire throughout deck 3. The burning laminates produced **toxic hydrogen cyanide and carbon dioxide gases**. The fire then spread to deck 4 and deck 5
- **Fire doors were not properly closed** as not designed for remote closing. **Fire was activated with ventilation from vehicle areas** closed to accommodations
- Those who tried to escape may have variously encountered thick smoke, **confusing corridor layouts, and poorly trained crew members**.
- The **captain and crew ultimately abandoned ship before all passengers were evacuated**, leaving many still on board the burning ship even after it was towed to the harbour
- 158 people, or approximately one-third of all passengers on board, died on the ship. Another victim died two weeks later from his injuries. 136 of those killed were

Norwegian

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Why ISM ? (Cont.)

Scandinavian Star, 07 APR 1990



Investigators proposed several reasons for why many passengers did not safely evacuate:

- Many people probably **did not hear the alarms** due to distance between their cabins and the alarms, and due to ordinary mechanical noise of the ship systems.
- Some people probably **could not find their way** out because of thick smoke obscuring the exit routes and signage.
- Burning melamine panels in the hallways produced **poisonous hydrogen cyanide and carbon monoxide** causing rapid unconsciousness and death.
- Numerous Portuguese crew members **did not speak or understand Norwegian, Danish or English, were unfamiliar with the ship, and had never practiced a fire drill**. Only a few crew members even thought to put on breathing masks before entering smoke filled corridors.
- On Deck 5, where most passenger deaths occurred, the hallways were arranged in a layout that contained dead-ends and did not otherwise logically lead to emergency exits.

Reasons for Accidents



Human Involvement

**Poor management
standards**

Poor qualifications

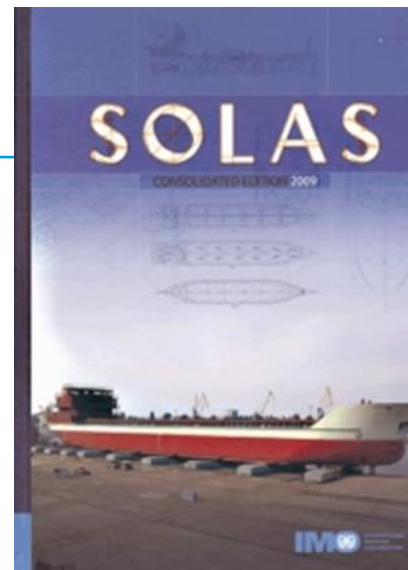
Communication problems

Lack of motivation

Fatigue

Cultural differences

Development of the ISM Code

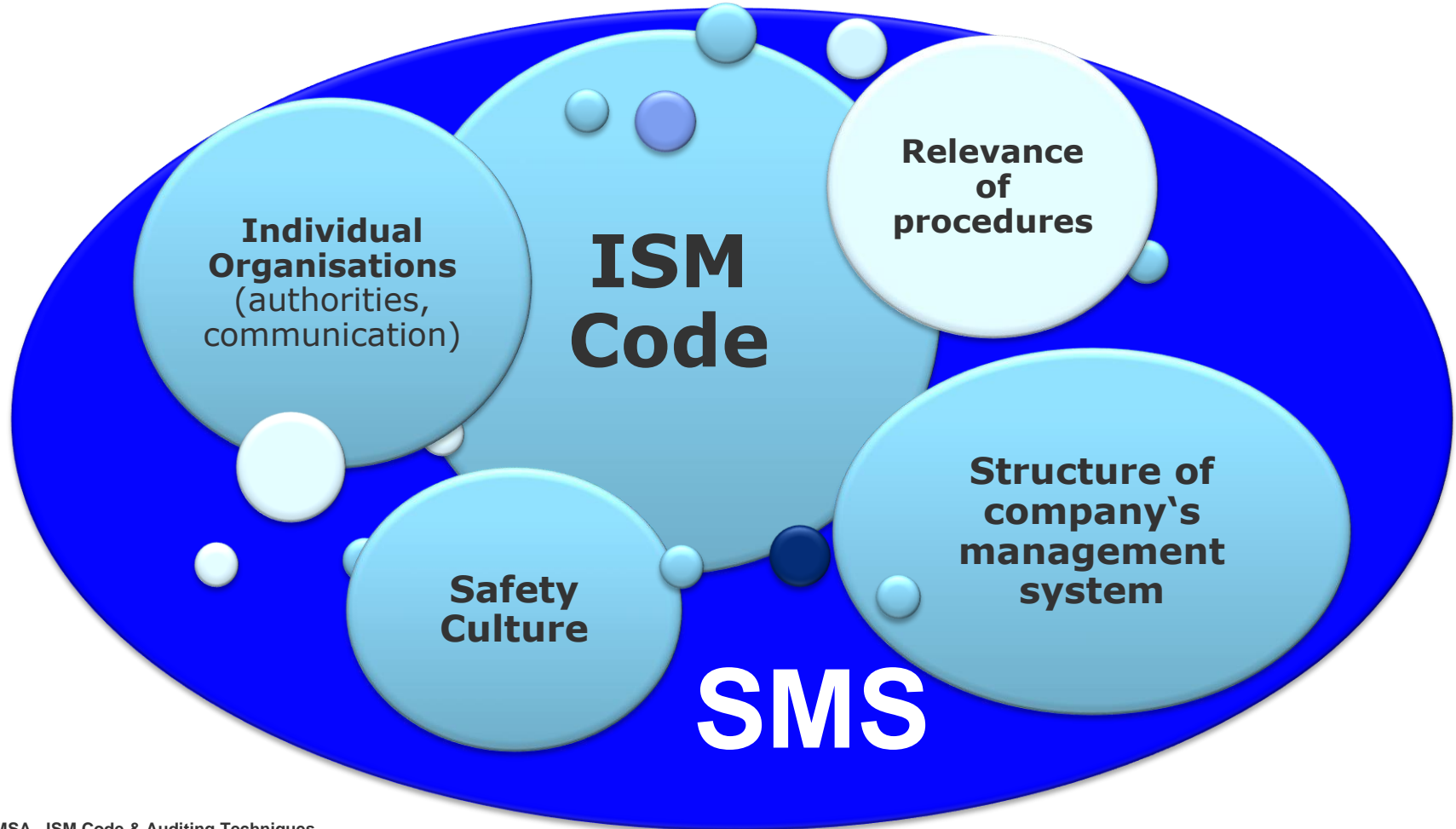


- Objective: Improvement of safety by means of a management system
- Development of international rules by IMO
- Establishing requirements in the ISM Code
- Inclusion of a new chapter IX into SOLAS
- Ratification by flag States
- Implementation into flag State legislation
- Control by port State /flag State

- **SOLAS, Chapter IX**
- **Valid for all types of ships with GT \geq 500 since 01.07.2002**
- **For Passenger Ships no limitation to GT**
- **Vessels on international trade**
- **Commercial vessels**

ISM Code requirements for a SMS

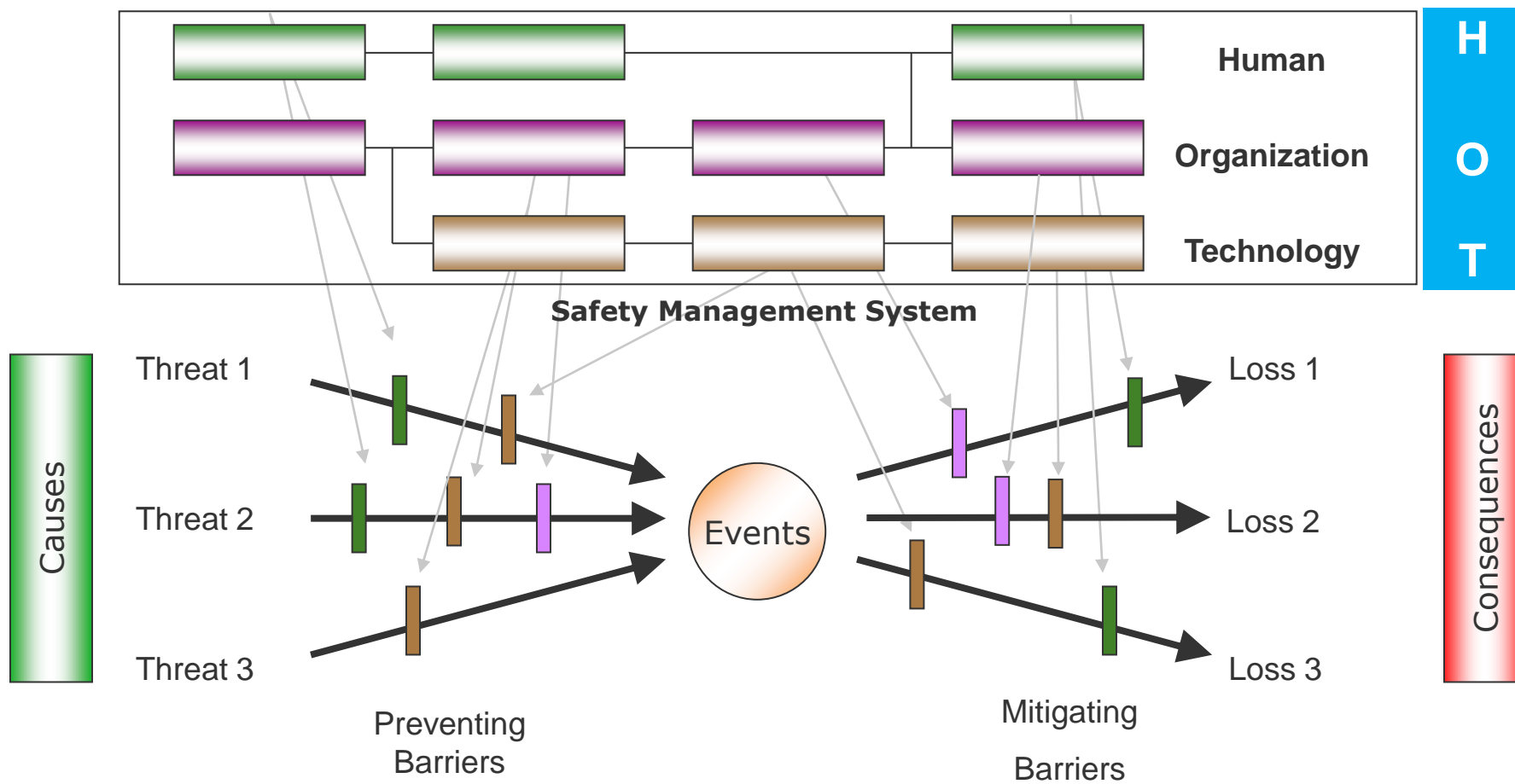
A fundamental principle of the ISM Code is that each ship operator is individual and that their SMS should be developed to fit their individual organisation!



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Role of the SMS in preventing accidents

ISM-Code 1.2.2.2: Assessment of all identified risks to its ship, personnel and the environment and to establish appropriate safeguards



Role of the SMS in preventing accidents (2)

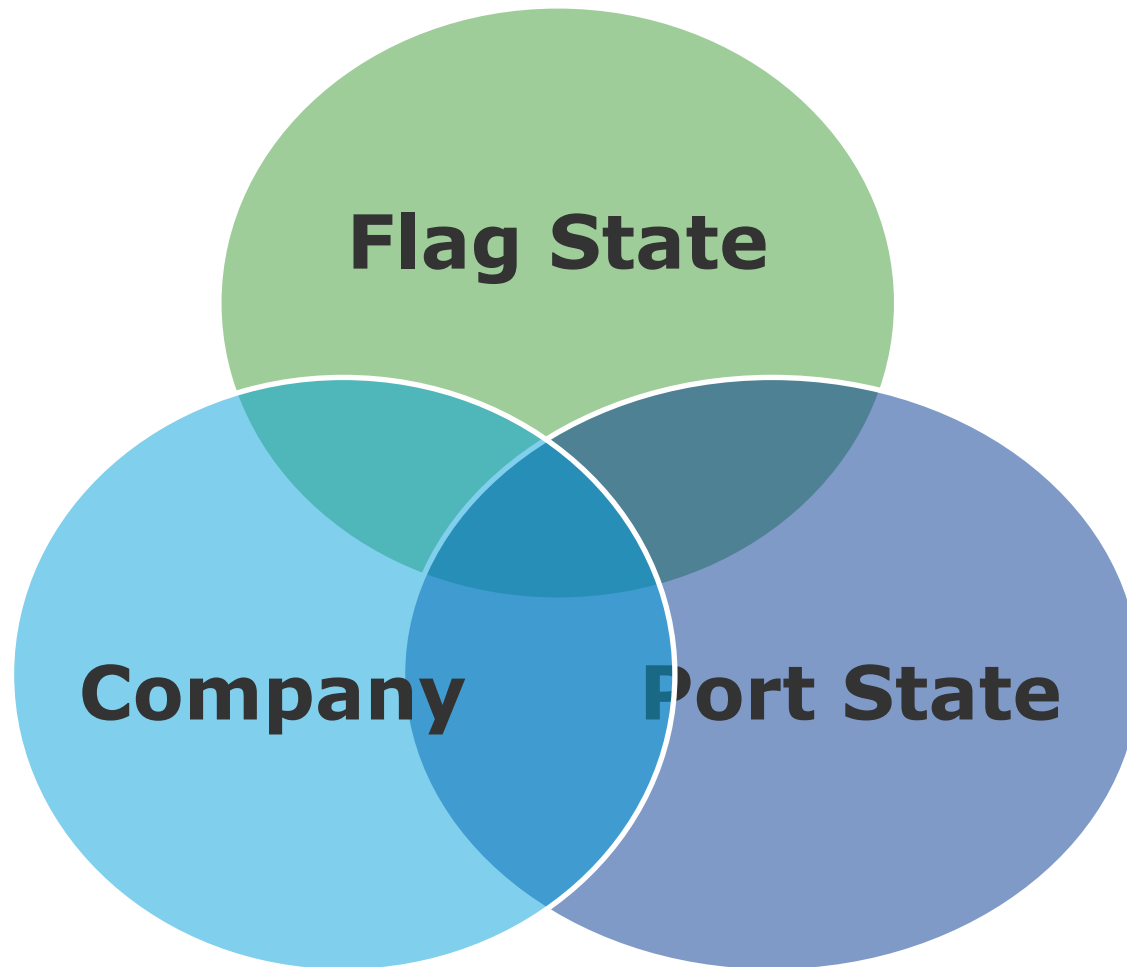
ISM-Code 1.2.2.2: Assessment of all identified risks to its ship, personnel and the environment and to establish appropriate safeguards

Barriers



- **H - Human (People / Behavior)**
- **O – Organization (Process / Procedures)**
- **T - Technology**

The 3 ISM “players”



Implementation by Administrations

- Compliance with the Code is enforced and monitored by the flag States
- Uniform implementation by administrations
- Guidelines on implementation of the ISM Code (Resolution A.1118(30), revoking Resolution A.1071(28)).
- Standards on ISM Code certification arrangements
- The company and shipboard SMS must also comply with additional national requirements, if any, including EU Regulations when applicable by flag.



Enforcing by Port State Control

Objective:

- **Improvement of safety and environmental protection**
- **Elimination of substandard ships**



Tools:

- Systematic control of every vessel in port
- Control of adherence by owners to all rules and regulations
- Controlling the correction of non-conformities
- Detention or banning of unsafe ships

Application by Companies

- Reaction is not enough
- Legislation does not control all the risks
- Ships operate under a wide range of different conditions
- Tendency to comply with the absolute minimum

ISM-Code requires:

- **Self assessment of operational risks and performance**
- **Ship specific safety measures based on self assessment**



Company has to ensure the safe operation of seaworthy vessels

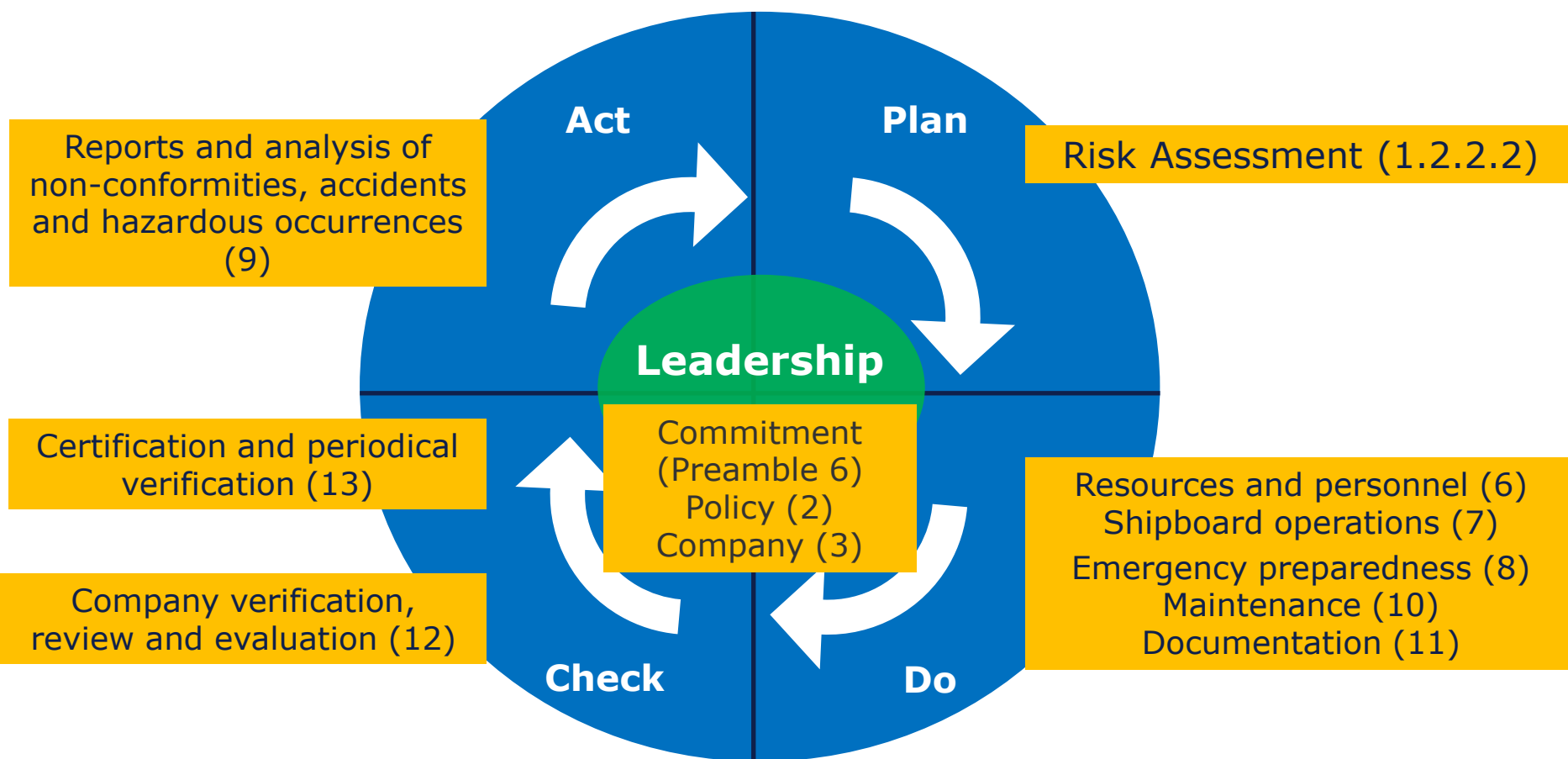
The Management System Model of the ISM Code



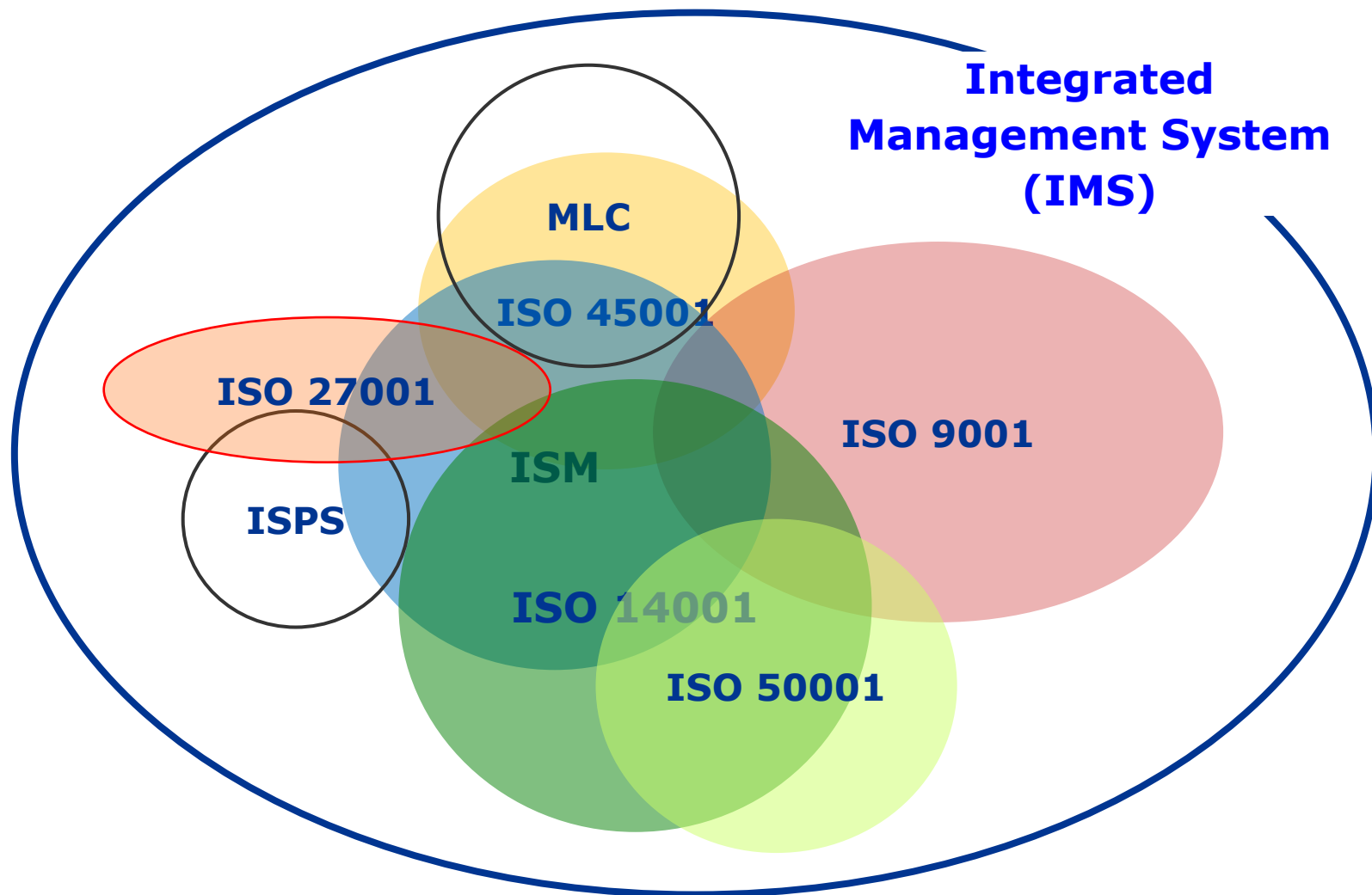
Definition as per ISO 9000:2015 (3.5.3):

Set of interrelated or interacting elements of an **organization** to establish **policies**, and **objectives**, and **processes**, to achieve those objectives

PDCA – Cycle with reference to ISM-Code



Outlook: Integrated Management Systems



Outlook: Integrated Management Systems

ISO "High Level Structure"

- 1 Scope
- 2 Normative Reference
- 3 Terms and Definitions
- 4 Context of the Organization
- 5 Leadership
- 6 Planning
- 7 Support
- 8 Operation
- 9 Performance Evaluation
- 10 Improvement

Plan

Do

Check

Act

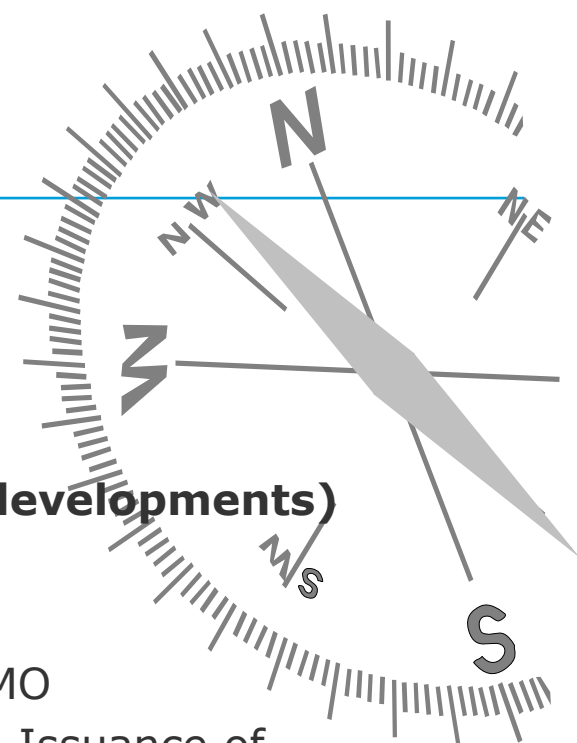


Closing – Module 1

Do you have any further questions?



Navigator



Module 1 – Evolution of Management Systems and the ISM Code

➔ **Module 2 – ISM Code Requirements (incl. latest developments)**

Module 3 – Stakeholders in Shipboard Operations

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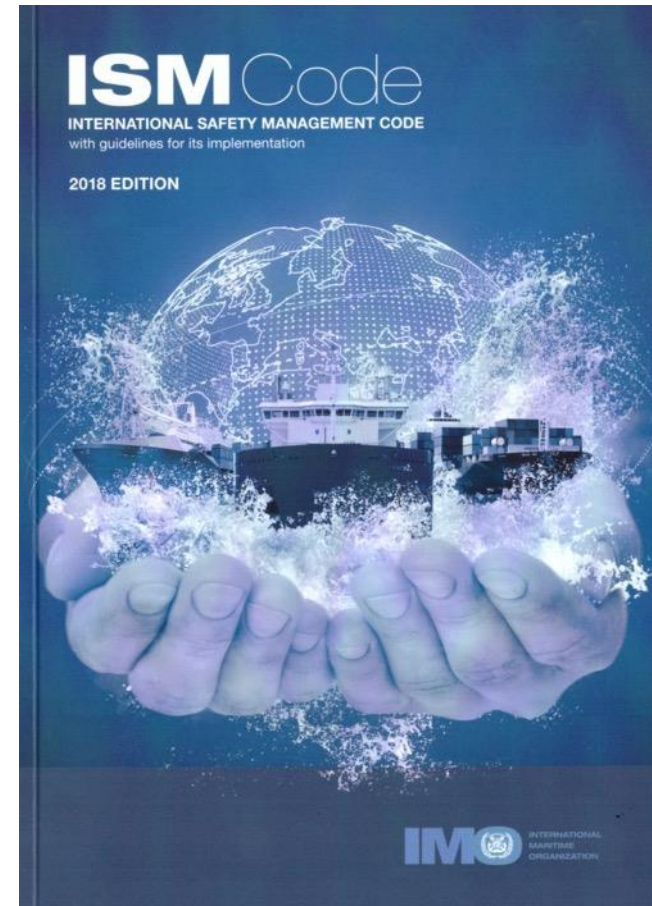
Module 11 – Role Play

Preamble

Part A Implementation Element 1-12

Part B Certification and Verification Element 13-16

MSC-MEPC.7/Circ.8 Guidelines for Implementation



The International Safety Management Code

	Part A Implementation		Part B Certification and Verification
1	General	13	Certification and Periodical Verification
2	Safety and Environmental Protection Policy	14	Interim Certification
3	Company Responsibilities and Authority	15	Verification
4	Designated Person(s)		Forms of Certificate
5	Master`s Responsibility and Authority		
6	Resources and Personnel		
7	Shipboard Operations		
8	Emergency Preparedness		
9	Reports and Analysis of		
10	Maintenance of the Ship and Equipment		
11	Documentation		
12	Company Verification, Review and Evaluation		

Element 1: General

Definitions

- Company (owner, manager, bareboat charterer)
- Administration (flag State)

Objectives

- Objectives of the Code
- Safety Management Objectives of the Company
- Compliance with requirements

Application

- See SOLAS IX/2 and may be applied to all ships



Shipping company in context of ISM

What does „shipping company“ actually mean ?

Commercial definition:

- Legal entity that owns and operates the freight or passenger ships

ISM definition 1.1.2:

- Company means the owner of the ship or any other organization or person such as the **manager, or the bareboat charterer, who has assumed the** responsibility for operation of the ship from the shipowner and who, on assuming such responsibility, has agreed **to take over all the duties and responsibility imposed by the Code**



„Ship Manager“ = DoC Holder

Element 1: General

- Objectives of the Code are to ensure
 - Safety at sea
 - Prevention of human injury or loss of life
 - Avoidance of damage to the marine environment
 - Avoidance of damage to property
- Objectives of the Company are to ensure
 - Safe practices in ship operation
 - Safe working environment
 - Assessment of all identified risks to its ship, personnel and the environment and to establish appropriate safeguards
 - Continual improvement of skills of personnel on board and ashore
 - Preparing for emergencies



Element 1: General

MLC

ISPS

- SMS to ensure
 - Compliance with mandatory international and national rules and regulations
 - Observance of applicable codes, guidelines, recommendations



Element 2: Policy

- **Commitment of management to the ISM-Code objectives:**

- Safe ship operation
- Protecting human life
- Avoiding accidents
- Pollution prevention

- Methods to achieve objectives

- Documented

- Implemented and maintained

- Familiar to all employees at all levels ship and shore



➤ **Company commitment, values and beliefs, cannot be enforced through the regulatory process**

Element 3: Company Responsibility and Authority

- Define responsibilities for the operation of vessel (Owners must report the full name and details to the Administration)
- Define and document responsibilities authorities and interrelation of all personnel
- Provide adequate resources and shore based support to enable the DP to carry out his/her function



Element 3: Company Responsibilities and Authority

- Responsibility of ship owner / operator / manning agencies also applies to:
 - Subcontractors (manning agencies, etc.)
- Sufficient control
 - ISO 9001 Certification
 - Visits, Meetings
 - Audits, Questionnaire
 - Evaluation / Audit reports



Element 4: Designated Person

- Ensure the safe operation of each ship
- Link between those on board and office
 - contact person for safety matters
 - contact person for the Master
- Direct access to the highest level of management
 - independent
 - easy to reach
- Responsibility and authority
 - monitoring safety and pollution prevention aspects
 - ensuring availability of resources and shore support



Designated Person

MSC-MEPC.7 / Circ.8

- Key role in the effective implementation of the SMS
- Sufficient responsibility and authority to support in establishing and implementation of a safety culture within the company
- Verification and monitoring of all safety and pollution prevention activities
 - Communication and implementation of the policy
 - Evaluation and review of the effectiveness of the SMS
 - Reporting and analysis non-conformities, observations, accidents
 - Organizing, monitoring internal audits
 - Revisions to the SMS

Qualification of a Designated Person

MSC-MEPC.7/Circ.6

QUALIFICATIONS

Designated Person should have a minimum of formal education

TRAINING

Designated Person should have undergone training relating to safety management elements in compliance with the requirements of the ISM Code

EXPERIENCE

Designated Person should have an adequate experience
The Company should provide training courses covering qualification, training and experience and the appropriate procedures connected to compliance with the ISM Code including practical training and continuous updating.

Element 5: The Master

To be clearly
defined and
documented

- Responsibilities

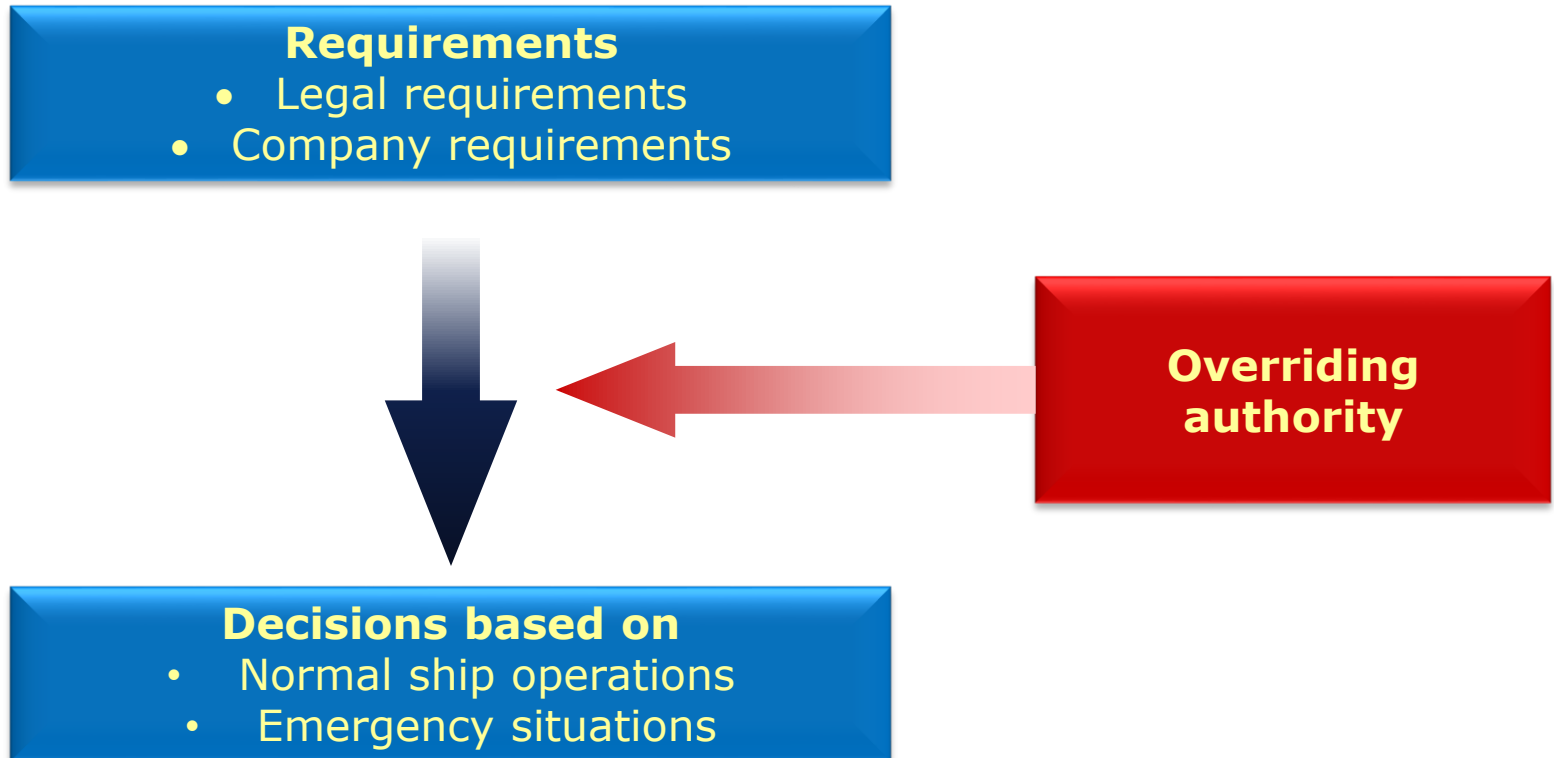
- Implementing and Maintaining the Safety Policy on the ship
- Verification and monitoring
- Periodically reviewing the SMS
- Reporting deficiencies to shore-based management
- Issuing orders and instructions
- Motivating the crew to observe the policy

- Authority

- Requesting shore assistance whenever required
- Overriding authority



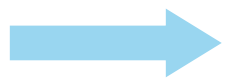
Obligation to Act



What is a Master's Review?

- Fundamental reassessment of the structure and effectiveness of the SMS from the Master's view
- Reporting of system deficiencies to shore based management
- Overall purpose:

Information to the company on the degree of implementation of the safety management system and its effectiveness



Documentation of the results

What does a Master's Review involve?

Reviewing

- Results of internal and external safety audits
- Port state control and flag State inspection
- Own inspection and classification reports
- Accidents, hazardous situations, operational risks, near misses
- Deficiencies, weak points
- Qualification of the crew, experience, language skills, training needs, motivation
- Training results
- Condition of ship and equipment
- Support of and communication with the office
- Suggestions for improvement

Module 2 / Activity 1

Master's Review

C

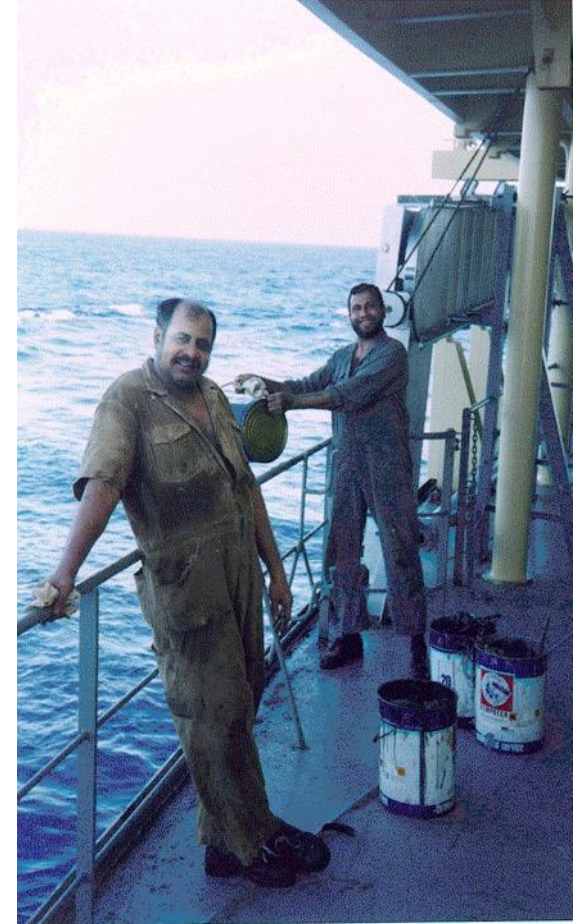
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Element 6: Resources and Personnel

- Master
 - Proper qualification
 - Conversant with the company SMS
 - Given necessary support by ship and shore
- Crew
 - Ship sufficiently manned according to safe manning certificate and appropriately in order to encompass all aspects of maintaining safe operations on board.
 - Qualified, certificated and medically fit
- Company Personnel
 - Proper qualification & familiarization with their duties
 - Conversant with the company SMS

Element 6: Resources and Personnel

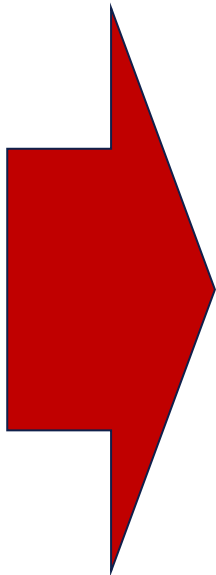
- On board familiarization related to
 - Safety and environmental protection
 - Function
 - SMS knowledge
 - Rules, regulations, codes and guidelines
- Working language
 - Information
 - Communication



Latest Amendments (MSC 92)



Amendments to the International Safety Management (ISM) Code by Resolution **MSC.353 (92)** in force since **01.01.2015**:



"6.2 The Company should ensure that each ship is:
.1 manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements; and
.2 appropriately manned in order to encompass all aspects of maintaining safe operations on board*."

* Refer to the Principles of minimum safe manning, adopted by the Organization by resolution A.1047(27)

Element 7: Development Plans for Shipboard Operations

- Plans, procedures, instructions, records and checklists
- Assessment of operational risks
- Prevention of failures and accidents by application of adequate work methods and risk control measures
- Tasks should be defined and assigned to qualified personnel (Familiarization & training needs)



Element 7: Development Plans for Shipboard Operations

- The shipping company must identify key shipboard operations which are relevant to safety and pollution prevention
 - Mandatory rules and regulations or specific requirements
 - Ship type, cargo, trading area
 - Operational experience
 - Recommendations by IMO, Administrations, Class, Industry
 - Hazardous situations to be controlled
- Appropriate to the Company
- Systematic methods

Element 7: Development Plans for Shipboard Operations (cont.)

What are key shipboard operations?

- ISM is looking for the shipboard operations which are key with respect to safety and environmental protection, e.g. those where there is a risk for anything can go wrong and lead to accidents, injuries or accidental pollution.
- These have to be identified and measures introduced to reduce the risk, by means such as competence (training, qualifications), procedures, instructions...
- So **RISK ASSESSMENT** has to be carried out to identify such operations. This applies not only to those operations listed as examples which are the traditional ones.
- The type of ship will lead to some different and peculiar risks inherent to the type of operation:
 - Tanker
 - Bulker
 - Passenger vessel, etc.

Element 8: Emergency Preparedness

- Company needs to identify potential emergency shipboard situations
 - **Ship specific !**
 - **RISK ASSESSMENT**
- Establish procedures to respond to them
- Programs for emergency drills - for all defined emergency cases
- Company's organization must be able to respond to emergency situations at any time



Emergency drills

- What drills are required by SOLAS?

Abandon Ship

Fire Fighting

Emergency Steering

**Entry in enclosed
Space**



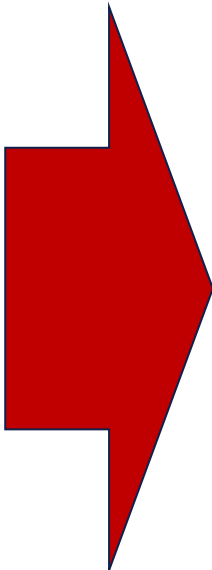
- ISM requires exercises for all identified emergency situations

Latest Amendments (MSC 92)



Amendments to the 1974 SOLAS Convention by Resolution **MSC.350(92)** in force since **01.01.2015**:

New SOLAS Reg. III/19.3.3 and 19.3.6 added related to **enclosed space entry and rescue drills**

- 
- to be held on board the ship at least once **every two months**
 - checking and use of personal protective equipment required for entry;
 - checking and use of communication equipment and procedures;
 - checking and use of instruments for measuring the atmosphere in enclosed spaces;
 - checking and use of rescue equipment and procedures;
 - instructions in first aid and resuscitation techniques.

Emergency Exercises

- Practical exercises for each emergency
- Established procedures must be followed
- Testing of communication channels
- Checking the plans for correctness
- Full responsibility and activity of replacements / substitutes to be checked
- Critical assessment after the exercise, clarification of questions
- Improvement of knowledge and self-confidence
- Incorporation experience gained through exercises
- Inclusion of passengers (where applicable)
- Company exercise for respond to emergency on board



Organization of shore based response

Levels of response:

- Emergency control
 - Immediate shipboard response measures to get the situation under control
- Emergency response
 - Shore-based operational and technical company support
- Emergency management
 - Divisional or regional response on the impacts of the emergency to the company, support on a higher level (incl. Class)
- Crisis management
 - Headquarters response on the impacts of the emergency to the company overall (stock exchange notifications, strategic decisions)



Structure of Contingency Planning

IMO Resolution A. 852 (20) & A1072(28): *Guidelines for the structure of an integrated system of contingency planning for shipboard emergencies*

Module I: Introduction

Module II: Provisions

Module III: Planning preparedness and training

Module IV: Response actions

Module V: Reporting procedures

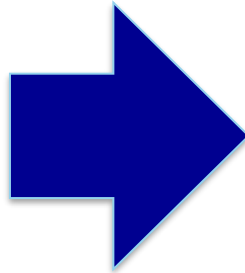
Module VI: Annexes (data, plans etc.)

For the emergency team :

- procedures
- life saving appliances
- data, information
- interfaces to other modules and emergencies

Element 9: Report and Analysis of Non-Conformities Accidents, Hazardous Occurrences

- Documentation of:
 - Accidents
 - Hazardous occurrences (Near Miss)
 - Non-Conformities
- Procedures for
 - Reporting
 - Investigation of causes
 - Analyse of causes
 - Implementation of



Corrective Action
+
Measures to prevent recurrence
=
Source for continual improvement

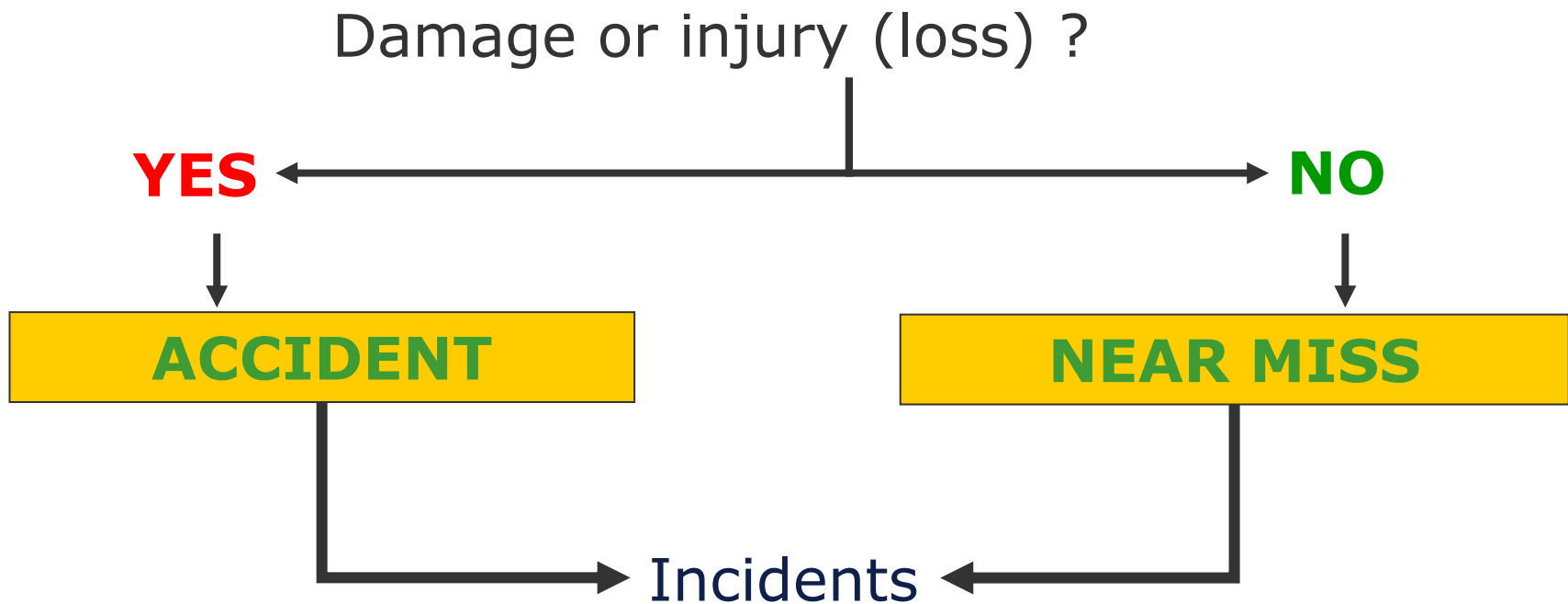
Element 9: Report and Analysis of Non-Conformities Accidents, Hazardous Occurrences

- Serious accidents often have minor causes
- Each deficiency must therefore be taken seriously!
- Immediate action required!
- Reporting of faults to superiors!
- Analysis of causes and taking of preventive action!



What is an Incident / Accident / Near Miss ?

An incident is an undesired event



Reporting of Near Misses

MSC-MEPC.7/Circ.7

Near-miss:

A sequence of events and/or conditions that could have resulted in loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage, or negative business impact

There are many barriers related to the reporting of near-misses. In many cases, near-misses are only known by the individual(s) involved who chose to report or not report the incident. Some of the main barriers to the reporting of near-misses include the fear of being blamed, disciplined, embarrassed, or found legally liable.

These barriers can be overcome by management initiatives such as:

- Encouraging a **"just-culture"** or a **"no blame culture"** in the company which covers near-miss reporting.
- **Assuring confidentiality** for reporting near-misses, both through company policy and by "sanitizing" analyses and reports so that personal information (information identifying an individual) of persons associated with a near-miss is removed and remain confidential. Personal information should not be retained once the investigation and reporting processes are complete.
- Ensuring that **investigations are adequately resourced**. Following through on the near-miss report suggestions and recommendations.
- Once a decision has been made to implement, or not implement, the report's **recommendations should be disseminated widely**.

Analysis of causes

Various aspects have to be considered:

- ✓ **Human**
- ✓ **Method**
- ✓ **Resources**
- ✓ **Machinery**
- ✓ **Environment**

Remember “Barriers”:

- H – Human (People / Behavior)
- O – Organization / Processes
- T – Technology



Element 10: Maintenance of the Ship and Equipment

Maintenance procedures/plans

- Engine
- Hull
- Systems, equipment
- Critical systems and equipment

In compliance with rules and regulations

- Inspections at appropriate intervals
- Reporting of Non-Conformities and possible cause
- Corrective Actions to be taken
- Records to be maintained



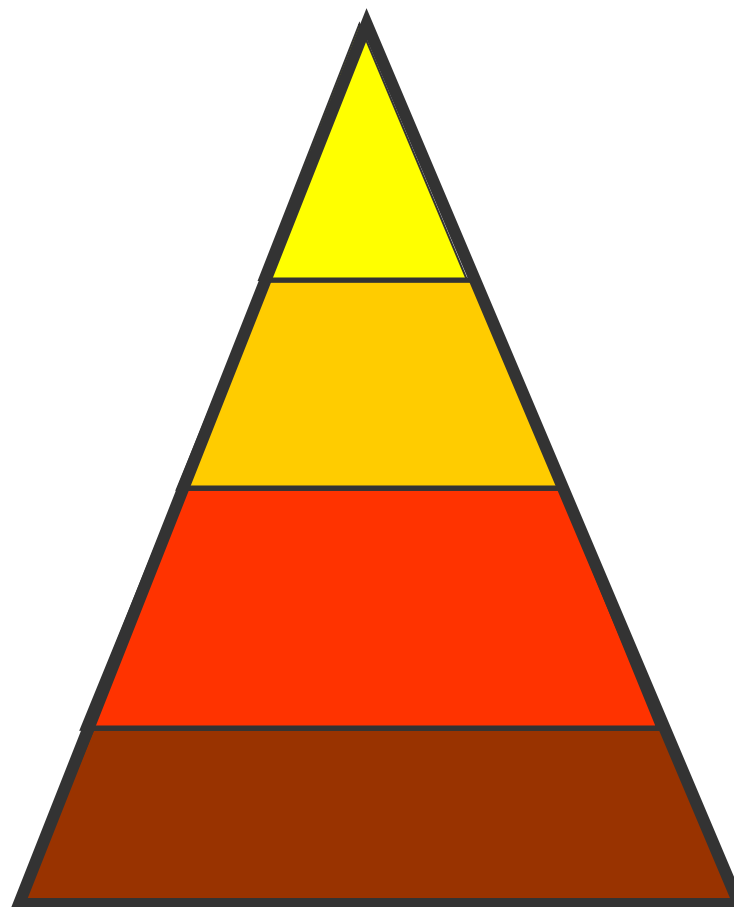
Maintenance Requirements

Company
standard

Manufacturers'
instructions

Classification
rules

Legislation



Maintenance Requirements

- Observe manufacturers' instructions
- Supervision by officer in charge
- Assess status of equipment
- Report deficiencies (ISM Code Element 9)
- Eliminate causes
- Record work (consumption of spares, measurement results)
- Adjust maintenance intervals as feasible/necessary



Identification of Critical Equipment

- Identification using **RISK ASSESSMENT**
- Measures promoting reliability of such equipment
- Particular designation in maintenance plan to prevent failure
- Shortened intervals for checks
- Monitoring by officers, engineers
- Adherence to makers' instruction
- Use of original spare parts
- Rotational use of duplicated machinery
- Crew properly trained for using them



Examples of Safety Related (Critical) Equipment

.....which may cause a safety risk in case of failure

- Propulsion, including auxiliaries
- Steering gear
- Electrical plant
- Ship's position lights, radar
- Crane, cargo handling gear

Stand-by Equipment

- Redundant provision
- LSA
- Alarms and recording



Element 11: Documentation

The System Documentation contains:

- Safety Management Manual
- Functions and job descriptions
- Ship documentation and Certificates
- Handbooks, plans, drawings
- Sea charts, Rules and Regulations
- etc.

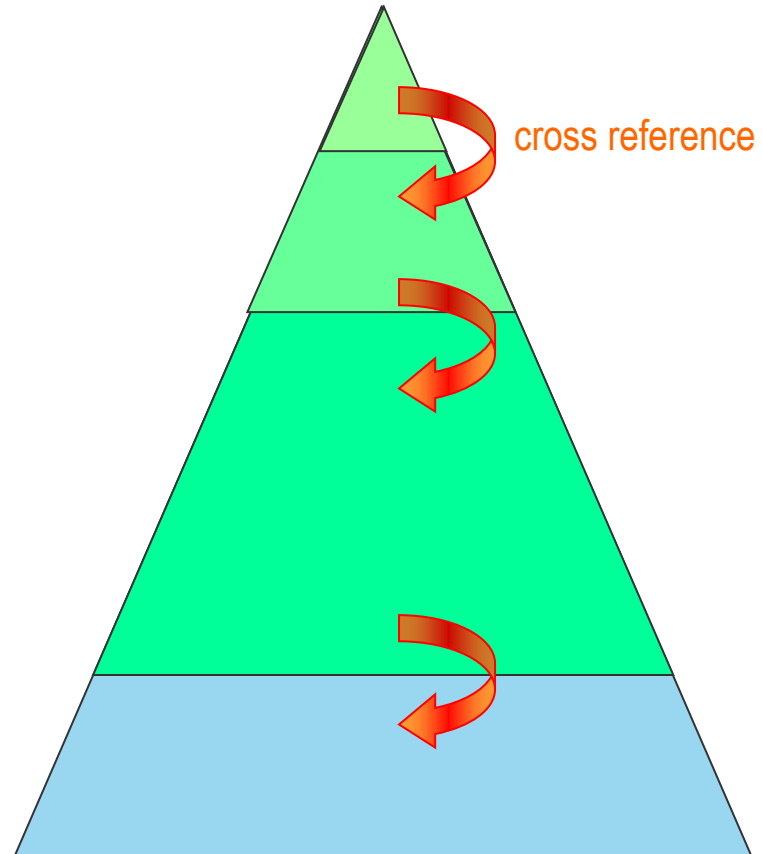
Procedure for document control

- Validity of documents
- Changes to documents



Sample Structure of Documentation

- Policies
- Organigram
- Function/job description
- Procedures
- Contingency plans
- Work instructions
- Orders
- Forms, checklists, data



Module 2 / Activity 2

Document Review

C

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Element 12: Company Verification, Review and Evaluation

Internal safety audits

- Documented procedures
- Intervals not exceeding 12 months
- Ship and shore
- Verify compliance

System review by management

- Master's review
- Results of internal audits
- Results of accident investigations
- Inspection results (e.g. port State)



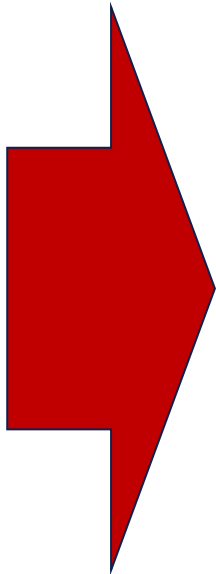
How is the introduction and maintenance of the SMS monitored?



Latest Amendments (MSC 92)



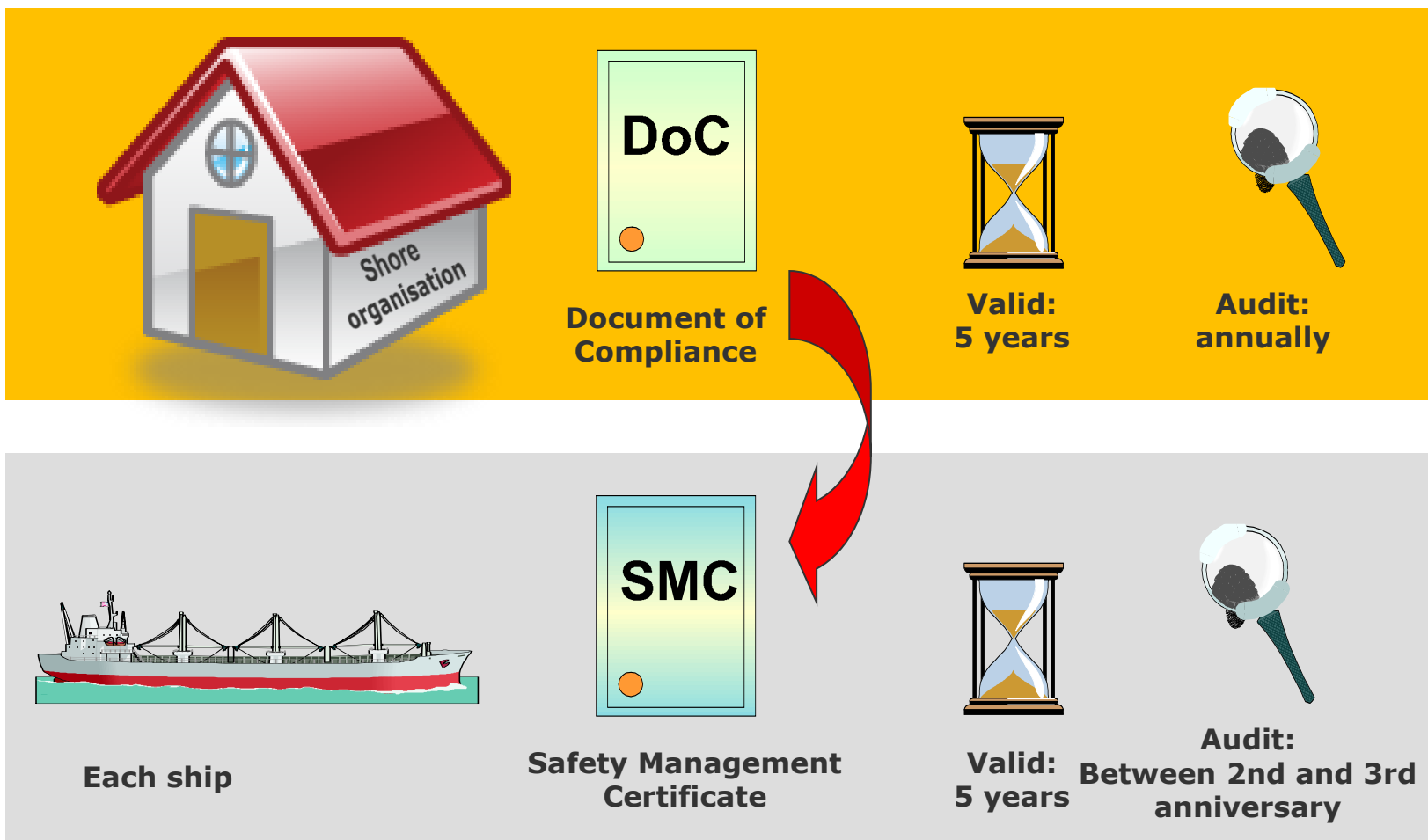
Amendments to the International Safety Management (ISM) Code by Resolution
MSC.353 (92) in force since 01.01.2015:



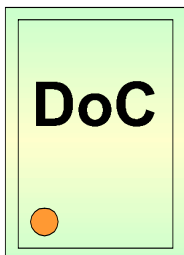
The following new paragraph 12.2 is inserted after existing paragraph 12.1 and the existing paragraphs 12.2 to 12.6 are renumbered as 12.3 to 12.7:

"12.2 The Company should periodically verify whether all those undertaking delegated ISM-related tasks are acting in conformity with the Company's responsibilities under the Code."

Element 13: Certification and Periodical Verification

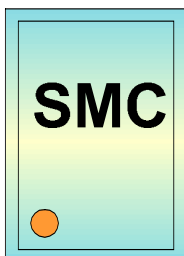


Element 13: Certification and Periodical Verification



Document of Compliance

- For that type of ship
- A copy of the DoC must be available on board



Safety Management Certificate

- For that ship
- The original of the SMC must be available on board



Verifications

- Carried out according to procedures acceptable to the Administration

Element 14: Interim Certification

Interim DoC

- Company is newly established
- Adds new ship types to its existing operation
- Has a safety management system that meets 1.2.3
- Plans to fully implement the SMS
- Validity not exceeding 12 months

Interim SMC

- Ship is new to the company on delivery
- Ship newly taken into the existing ship operation of the company
- Ship is changing flag
- After verification of minimum requirements on board
- Validity not exceeding 6 months with possible extension for 6 months

Requirements for an Interim SMC

- DoC or Interim DoC valid for the ship type concerned
- Company SMS comprises the essential elements of the ISM Code and has been verified
- Master and officers are aware of the company SMS and of the plans for its implementation
- Important instructions required to be given prior to leaving port, shall be established
- Plans for internal audits within three month must be there
- Information on the SMS have been given to the entire crew in their working language
- Fulfillment of these conditions is checked through verification

Element 15: Verification

All verifications required by the ISM code

- carried out according to procedures acceptable to the Administration.
- Guidelines are available to establish such procedures



Element 16: Forms of Certificates

DoC, SMC, interim DoC and interim SMC

- Should be designed according to the models
- A translation in English or French must be included

DoC and interim DoC might be endorsed

- To specify any operational limitations of the ship types included in the safety management system.



Certification Process

Company

- select certification body
- establish and implement "basic" SMS, develop SMM
- make application
- submit SMM for review
- amend documentation
- perform internal audits
- perform system review
- initiate corrective actions (if required)
- provide copy of Interim DoC
- implement corrective actions (if required)

min.
3
months

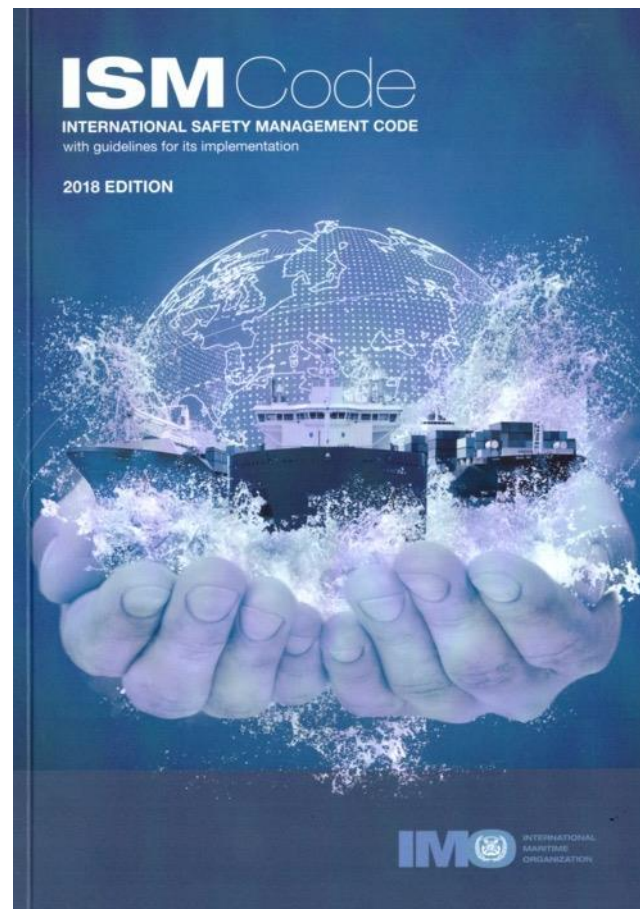
Flag State, Certification Body (R.O.)

- verify documentation
- interim office audit
- issue Interim DoC
- audit vessel
- issue Interim SMC

ISM Code - Latest Developments

Cyber Security

Covid-19



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Cyber Security –Why ?



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30th September 2020

The International Maritime Organization (**IMO**) was second major shipping organisation to be hit by a cyber attack that week.



IMO headquarters in London. Credit: IMO

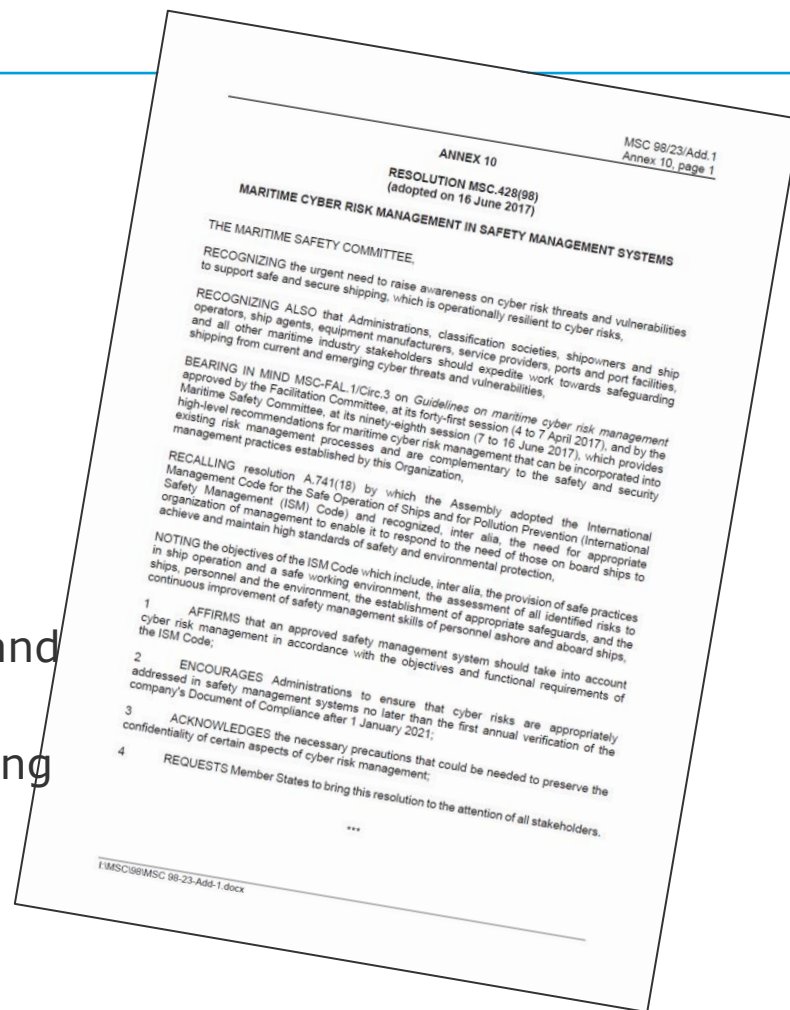
28th September 2020

CMA CGM identified a security breach and had to shut down the external access to its network to stop the malicious software or malware from spreading further into its systems.



Cyber Security

- **Resolution MSC.428(98)**
- Cyber Security to be integrated into the company's SMS
- To comply not later than at the first annual audit of the DoC after 1 January 2021
- Many Companies have already developed and implemented either Security Management Plans or have included those into the existing Safety Management System.
- Risk ZERO does not exist



<https://www.dnvgl.com/maritime/webinars-and-videos/videos/cyber-security-awareness.html>

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MSC-FAL.1/Circ.3 - Guidance On Maritime Cyber Risk Management

Vulnerable systems

could include, **but are not limited to:**

- .1 Bridge systems;
- .2 Cargo handling and management systems;
- .3 Propulsion and machinery management and power control systems;
- .4 Access control systems;
- .5 Passenger servicing and management systems;
- .6 Passenger facing public networks;
- .7 Administrative and crew welfare systems; and
- .8 Communication systems.

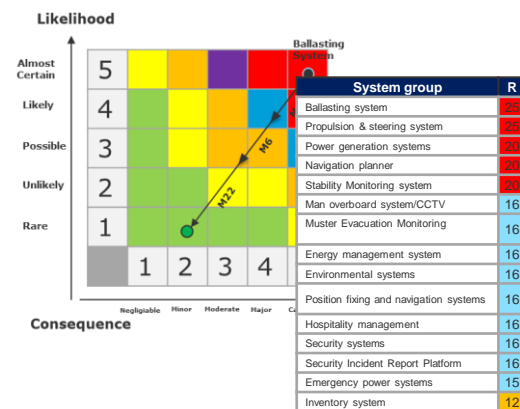
Threats

Threats are presented by **malicious actions** (e.g. hacking or introduction of malware) or the unintended consequences of **benign actions** (e.g. software maintenance or user permissions). ... Effective cyber risk management should consider both kinds of threat.



Cyber risk management

As such, these Guidelines recommend a risk management approach to **cyber risks** that is resilient and evolves as a **natural extension of existing safety and security management practices**.



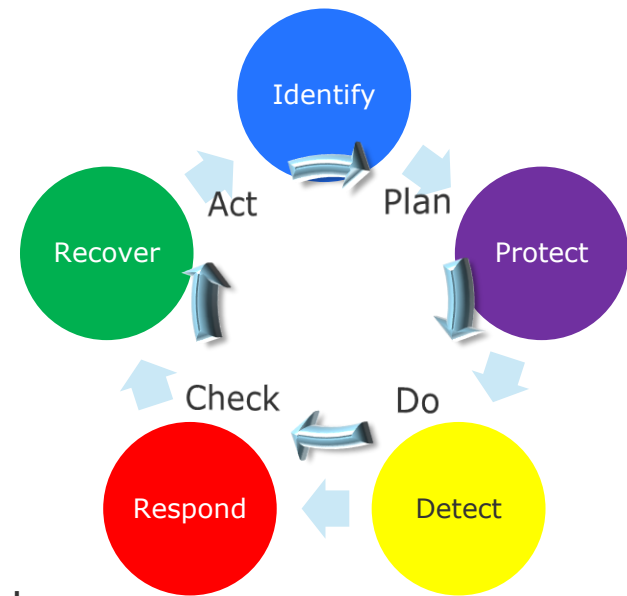
Integration of Cyber Security

Topics:

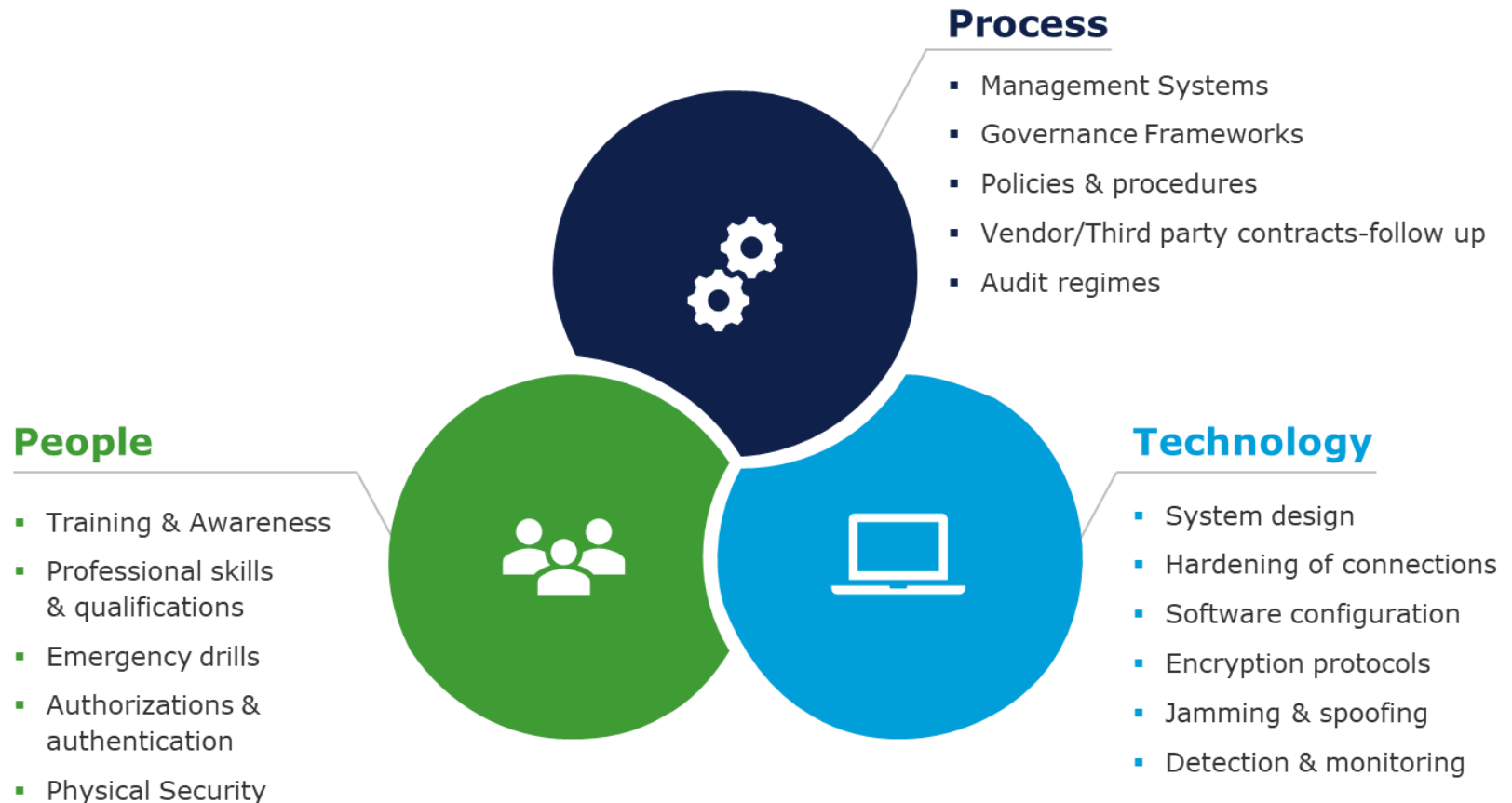
- IT & OT Systems
- Identification of threats
- Identification of vulnerabilities
- Risk Assessment
- Development Protection measures
- Establishing Contingency plans
- Respond to & recover from cyber security incidents

Implementation:

- The Guidelines on Cyber Security Onboard Ships (BIMCO & others)
- ISO 27001:2017 – Information Security Management Systems
- DNVGL-RP-0496 - Cyber security resilience management for ships and mobile offshore units in operation
- IACS Recommendation on Cyber Resilience (No. 166)
- DNV GL Cyber Secure Class Notation



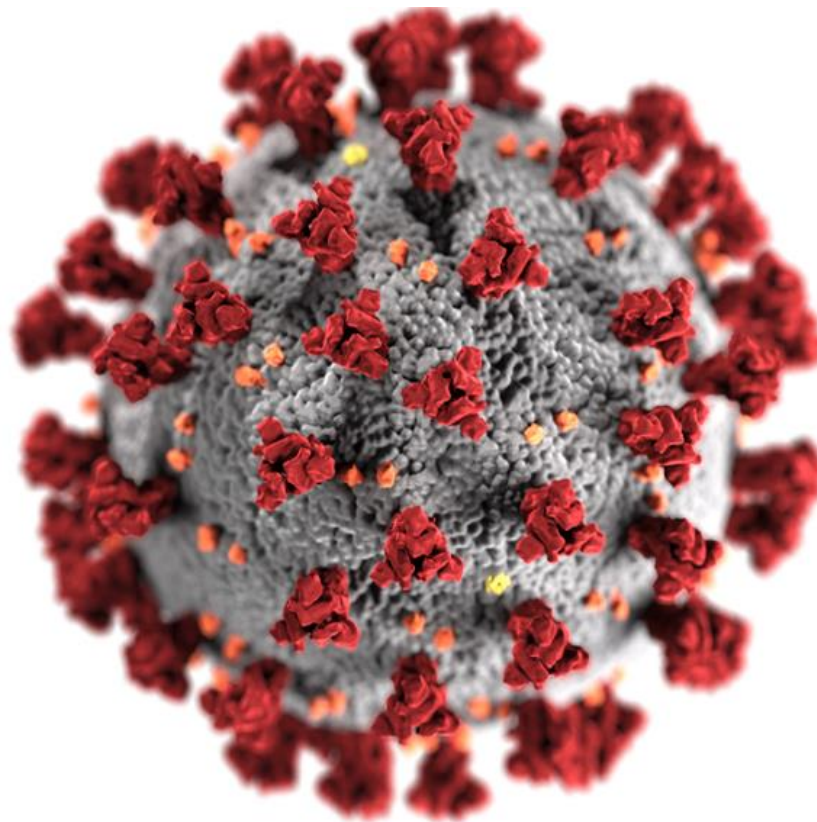
Cyber security protection measures



Discussion: Auditing Cyber Security according to ISM Code



COVID-19



ISM Code and the COVID-19

- Over four hundred thousand seafarers around the world are stranded at sea due to coronavirus travel restrictions, unable to go home or even get medical care.
- Another 400,000 remain home, unable to take over the jobs at sea and in serious financial hardship.



ISM Code and the COVID-19 (cont.)

- ILO adopted a resolution asking nations to take action by providing medical care to seafarers in need, waiving visa or documentation requirements and designating seafarers as key workers who are allowed to go home.
- Seemingly UN, in their Seventy-fifth session Agenda item 128 (a) of 24 November 2020, urges Member States to designate seafarers and other marine personnel as key workers.

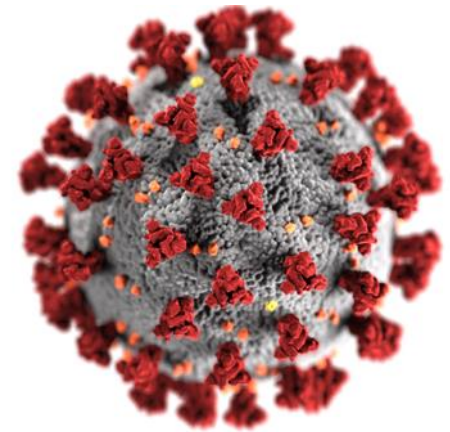


➤ Refer to **MSC.1/Circ.1636** of 2nd December 2020 - INDUSTRY RECOMMENDED FRAMEWORK OF PROTOCOLS FOR ENSURING SAFE SHIP CREW CHANGES AND TRAVEL DURING THE CORONAVIRUS (COVID-19) PANDEMIC

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ISM Code and the COVID-19 (cont.)

- **IMO Circular Letter No.4204/Add.18 (26 May 2020)** - Joint Statement IMO-ICAO-ILO on designation of seafarers, marine personnel, fishing vessel personnel, offshore energy sector personnel, aviation personnel, air cargo supply chain personnel and service provider personnel at airports and ports as key workers, and on facilitation of crew changes in ports and airports in the context of the COVID-19 pandemic
- **ILO's 2006 Maritime Labour Convention (MLC)** limits the maximum continuous period that a seafarer should serve on board a vessel without leave is 11 months. Actually, seafarers have been required to remain on board beyond the 11-month maximum period. In some instances, seafarers have not been able to go home for 17 months



ISM Code and the COVID-19 (cont.)

- Also, surveys and relevant certifications are being delayed as a result of the coronavirus (COVID-19) pandemic. For example, surveyors have been denied access to ports or are otherwise unable to board ships to carry out inspections.
- As a result of this pandemic, a disruption in the normal survey and certification procedure led IMO to issue Circular Letter No.4204/Add.19/ Rev.2 dated 22 July 2020 which includes an annexed "Guiding principles for the provision of technical and implementation advice to flag States when considering whether to permit statutory certificate extensions beyond 3 months"

https://www.deutsche-flagge.de/de/redaktion/dokumente/dokumente-dienststelle/imo-circular-letter-no-4204-add-19-rev-2_corona.pdf



ISM Code and the COVID-19 (cont.)

Consequently, when auditing Vessels / Companies nowadays, we are likely to find:

- ❑ Expired statutory vessel certificates (SOLAS, ILO)
- ❑ Expired crew licences (ISM, MLC2006, STCW95)
- ❑ Expired seafarers medical examinations (MLC2006)
- ❑ Non-compliances with MLC2006 and other flag state requirements.



ISM Code and the COVID-19 (cont.)

Remote Surveys & Audits:

- Remote surveys are a common practice since 2017 by some Classification Societies but are limited to occasional surveys and always subject to an equal level of confidence as in-person surveys.
- Attempts to perform remote auditing are being scrutinized but not yet implemented.
- Either surveys or audits will have to be accepted by the relevant flagstate.



Closing – Module 2

Do you have any further questions?

