



# Ship Inspection Report 2.0 (SIRE 2.0)

by PTT Group Marine Excellence

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**September 25<sup>st</sup>, 2023**



# SIRE 2.0 Technical modules



# Introduction to SIRE 2.0



1

Launched in 1993, the OCIMF Ship Inspection Report Programme (SIRE) has governed over 180,000 inspection reports. As a result, SIRE has made a significant contribution to improving the overall safety record of the maritime industry.

2

As the industry continues to evolve, its risk profile changes. More sophisticated risk measurement and management tools are now available. Against this background, it is now time to strengthen SIRE and ensure it remains truly effective in today's and future maritime environment.

3

OCIMF has developed an enhanced and risk-based vessel inspection programme that will supersede the existing SIRE programme. The new regime will more accurately report on the quality of a vessel and its crew (on an ongoing basis) and indicate future likely performance.

4

The principles of this new inspection regime, known from this point forward as *SIRE 2.0*, will in future, be imbibed in all of OCIMFs inspection programmes. This includes OCIMFs Inspection Report programme for Barges (SIRE Category-3) and Offshore Vessel Inspection Database (OVID).



# Contributing Factors



## Ship Inspection Report (SIRE) Programme

Vessel Inspection Questionnaires for Oil  
Tankers, Combination Carriers, Shuttle Tankers,  
Chemical Tankers and Gas Tankers, Seventh  
Edition (VIQ 7)

22 February 2019

Oil Companies International Marine Forum



Feedback from the industry relating to the effectiveness of the SIRE Programme.



Many of the questions within the existing VIQ 7 related to hardware.



Causes of incidents were not always related to hardware but to human action or inaction.



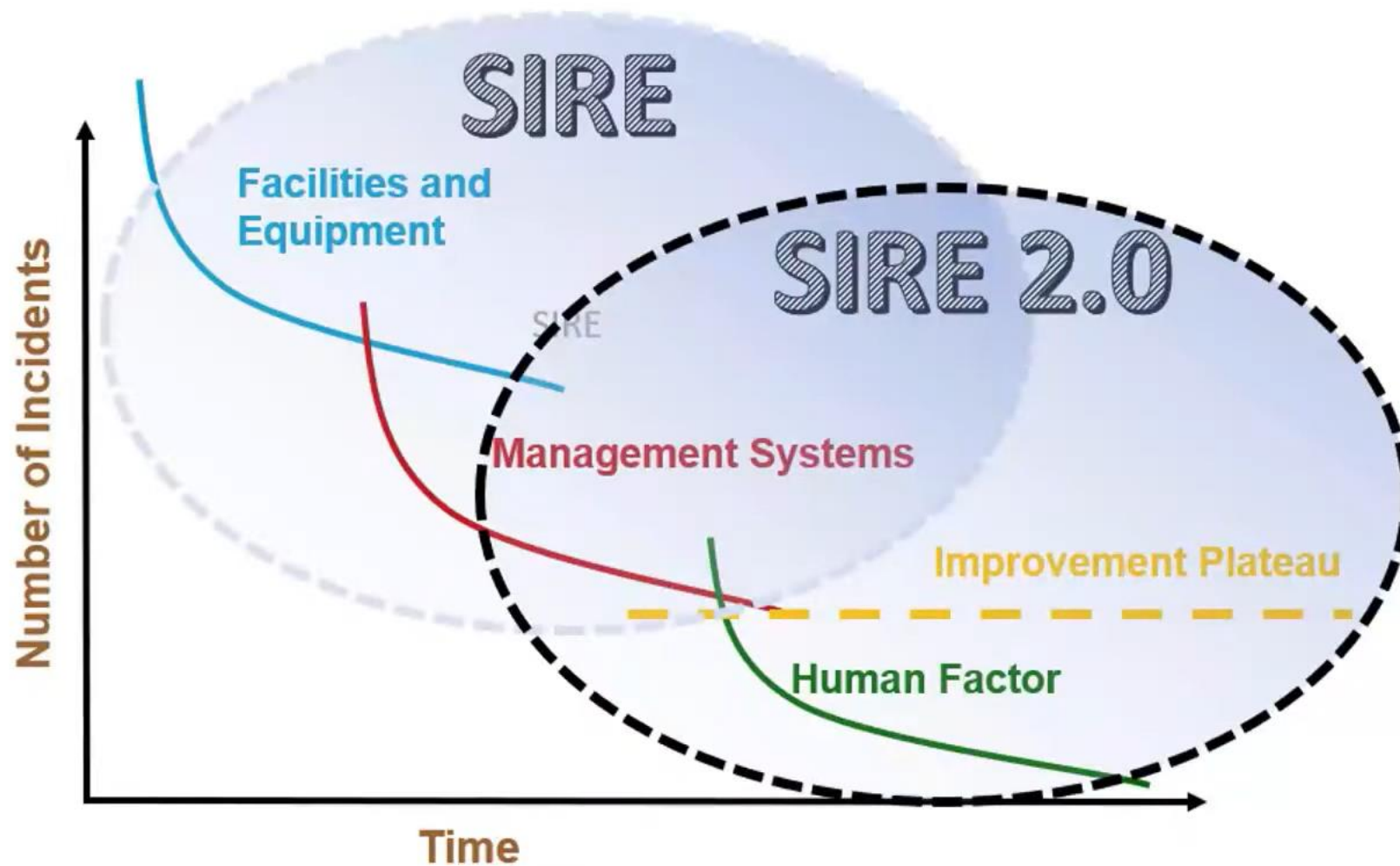
Concerns were identified under the VIQ 7 process – the VIQ 7 contained too many questions – questions were not targeted or focused towards higher risk areas - fulfilment of the VIQ



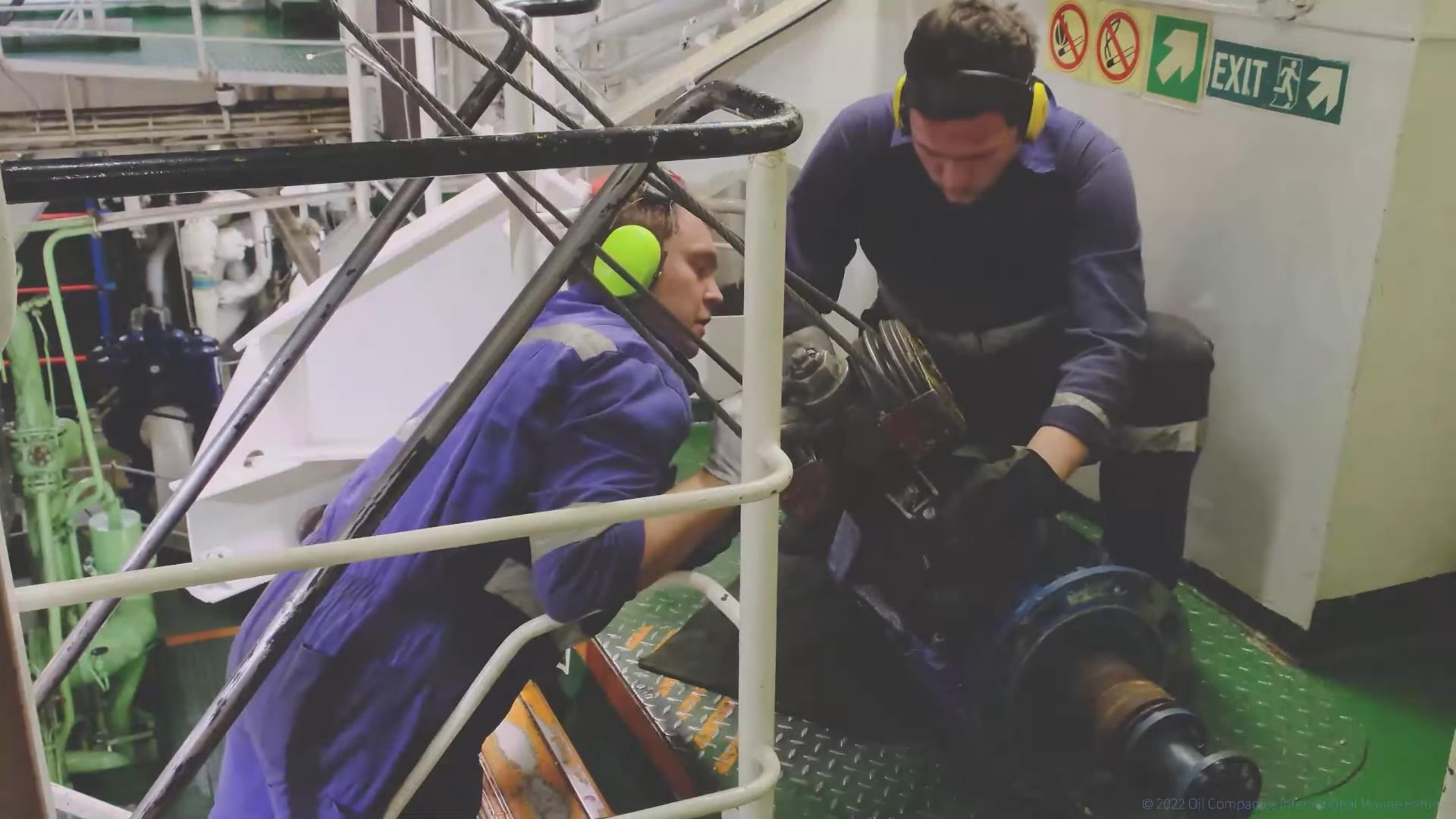
Critical operations not given repeatable coverage – time management not always consistent - potential exists for improved data mining.

# SIRE 2.0 Step change

Further step change towards an industry that causes no harm to people or the environment

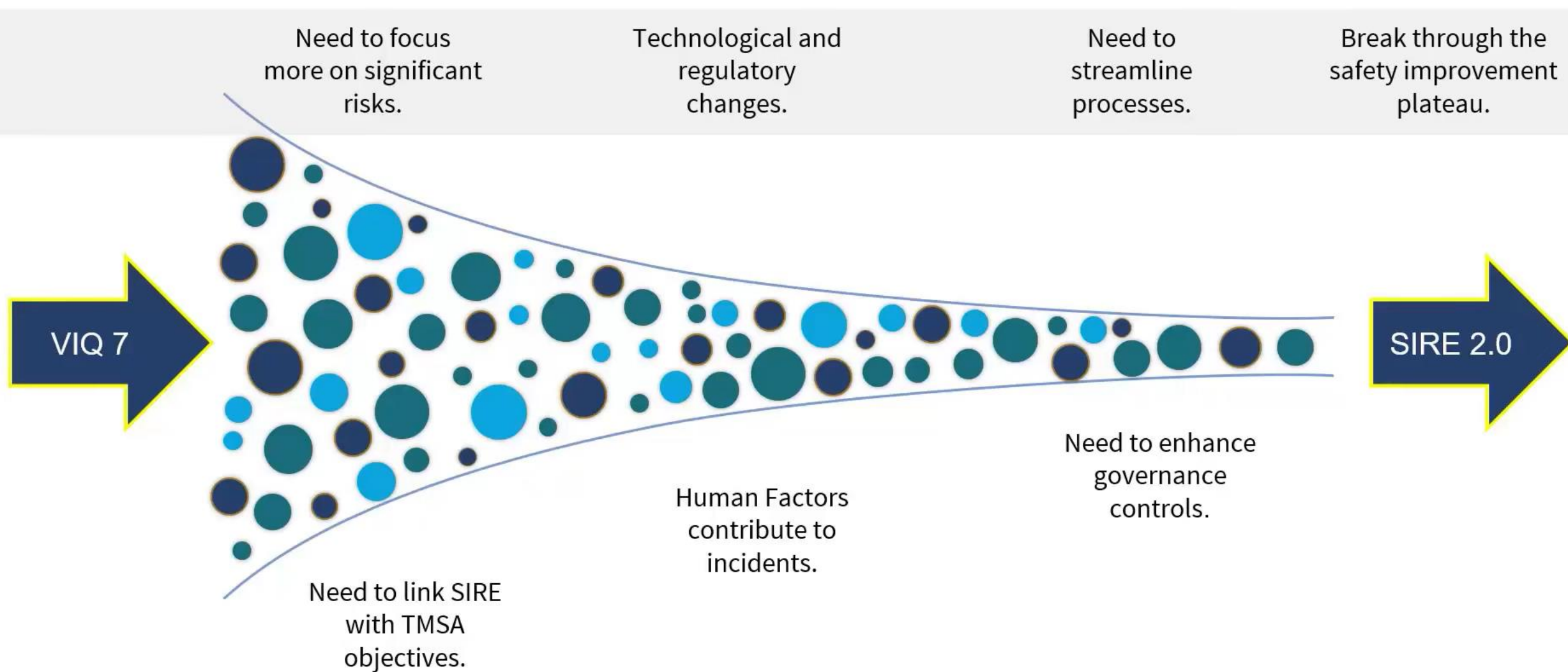








# The need for Change





# Strategic goal and objectives

**Goal:** An enhanced and risk-based vessel inspection Programme that will provide more accurate information and enable better judgements on the quality and likely future performance of a vessel.

## ACCURACY

More accurate description of how key HSSE risks are managed on a vessel.

achieved through...

Dynamic risk-based inspection process focused on equipment, procedures, and human factors.

## CAPABILITY

Inspectors of highest quality, consistency and integrity.

achieved through...

New technical and human factors training.  
Enhanced governance controls.

## RELIABILITY

Increased confidence and trust in programme.  
Reduced number of repeat inspections.

achieved through...

New policies and Code of Conduct.  
New Quality Assessor team located in all regions.

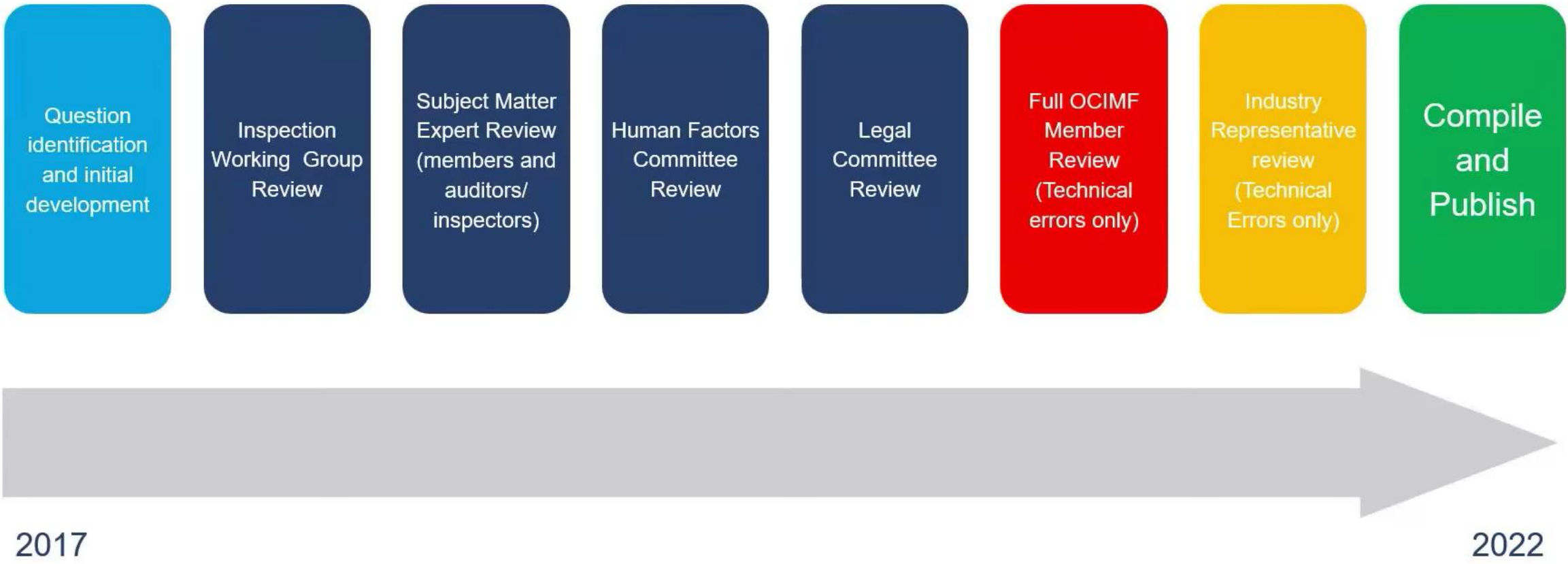
## ADAPTABILITY

Responsive to industry trends and human factors.

achieved through...

Full digitization.  
Use of intrinsically safe mobile tablet device with bespoke software.

# SIRE 2.0 Question set development and review process





# An overview of inspection process



Inspection request/inspector validation	Vessel pre-inspection data input	Risk-based inspection questionnaire automatically created	Inspector preparation for inspection	Inspection execution	Inspection report
Inspection request/validation tool with inbuilt rules and criteria to identify suitable inspectors for an inspection.	<ul style="list-style-type: none"> <li>Vessel particulars</li> <li>Crew details</li> <li>Certificates</li> <li>Pre-inspection questionnaire</li> <li>Past inspection observations (core questions only)</li> <li>Incident data</li> <li>Standard Photoset</li> </ul>	<p>Risk-based VIQ created, using bow tie methodology</p> <p>Questions set automatically compiled to form a Compiled Vessel Inspection Questionnaire (CVIQ).</p>	Inspector reviews and analyses data provided on the vessel in advance of the inspection.	<p>Observation reporting tool with:</p> <ul style="list-style-type: none"> <li>Grades of response (in addition to Yes/No).</li> <li>Responses against Equipment, Procedures and Human Based Tasks.</li> </ul> <p>Multi-media content – photographic evidence to support negative observations where applicable.</p>	A report that accurately describes how key safety and operational risks are managed and verified onboard a vessel. Quality verified by OCIMF using targeted approach.



# Benefits of SIRE 2.0 to the Industry



1

Bespoke question set for an Inspection, meaning the questions presented to the Inspector are much more applicable to the Vessel and its cargo.

2

Questions answered from a separate Hardware, Process, Human Factor and photographic perspective.

3

Questions can be simultaneously answered both negatively and positively, from different perspectives.

4

Question category responses can be binary or graduated.

5

Negative observations are detailed and codified and can be systematically compared and data mined across Inspection, Vessel and fleet level.

6

Inspection Reports contain Inspector's photographic contributions.

7

Integrations receive the Operator's uploaded photographs and any PIQ questions/responses which are assigned as supplementary content to questions.

# SIRE 2.0: Understanding the CVIQ

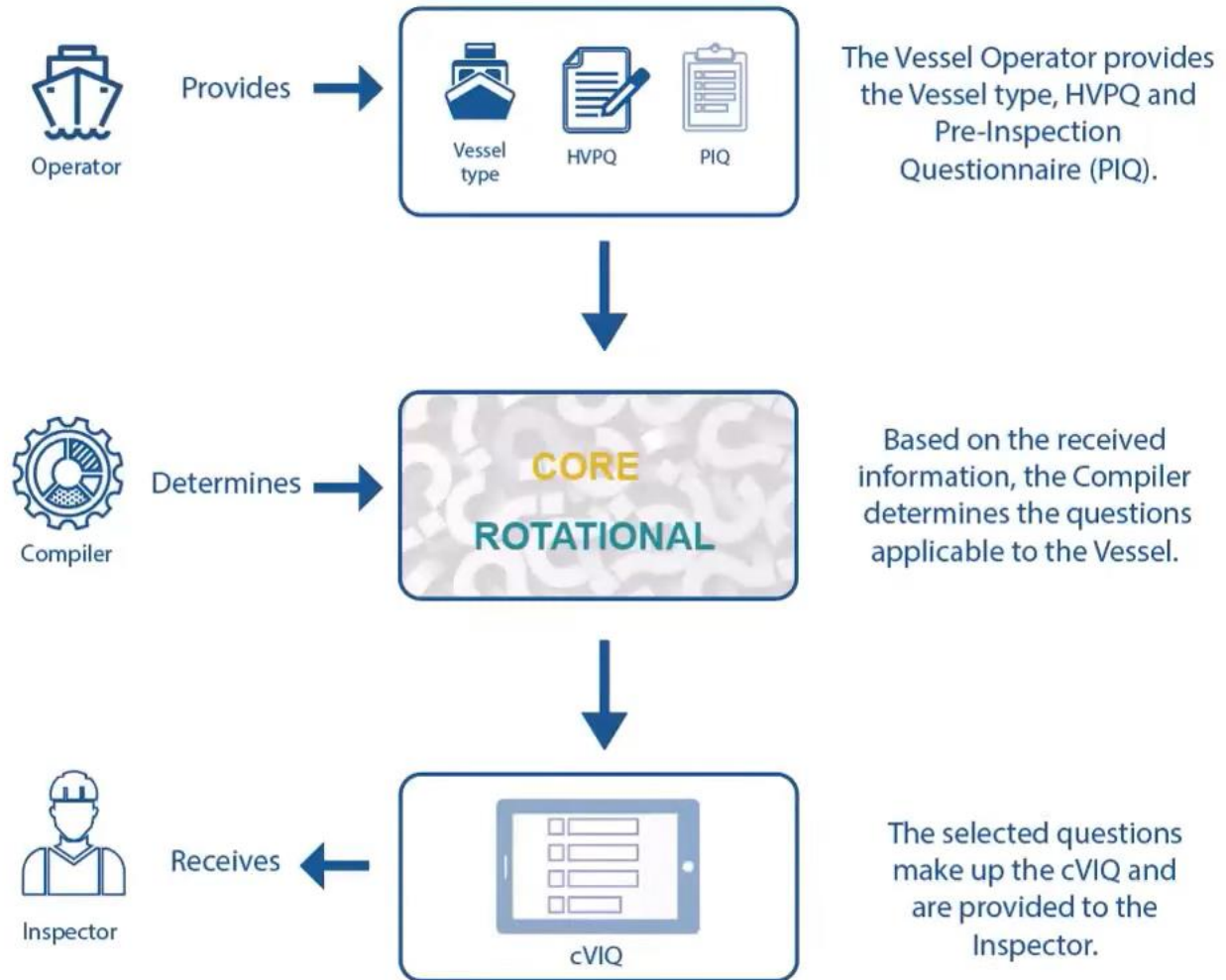


	SIRE VIQ7	SIRE 2.0
<b>What questions are included in the Inspection?</b>	The template is fixed to the Vessel type and the variants selected	A CVIQ is compiled according to the HVPQ and PIQ. Questions are included according to risk rating to 'core' or 'rotational'
<b>How is the question structured?</b>	A simple Yes/No response, with supplementary options for N/A or Not Seen	Multiple categories of response for <b>Hardware, Process, Human Factors</b> and photograph validation
<b>How does the Inspector answer the questions?</b>	Binary: positive or negative	A graded scale of responses with various grades of positive options
<b>What are the contents of a negative observation?</b>	Free text observation contents	One or many negative observations identifying a codified subject and nature of concern
<b>What forms of media can be added by an Inspector?</b>	Not supported	Photographs can be taken to support question responses and negative observations
<b>What data is provided by the Vessel Operator to support the Inspection?</b>	HVPQ, crew, PSC and incidents	A pre-inspection questionnaire and vessel standard photography, in addition to HVPQ, crew, PSC and incidents.



# What questions are included in the inspection?

- A bespoke Inspection is created for each SIRE 2.0 Inspection.
- The custom Inspection template is a **Compiled VIQ (CVIQ)**.
- The compiler creates a set of questions applicable to the Vessel based upon the Vessel type and the Operator's responses to the HVPQ and Pre-Inspection Questionnaire (PIQ).
- The desired target Inspection duration is divided into question areas, each with a time allocation, to ensure an even distribution of questions.





# What questions are included in the inspection?

All SIRE 2.0 questions are ranked according to risk assessment models.

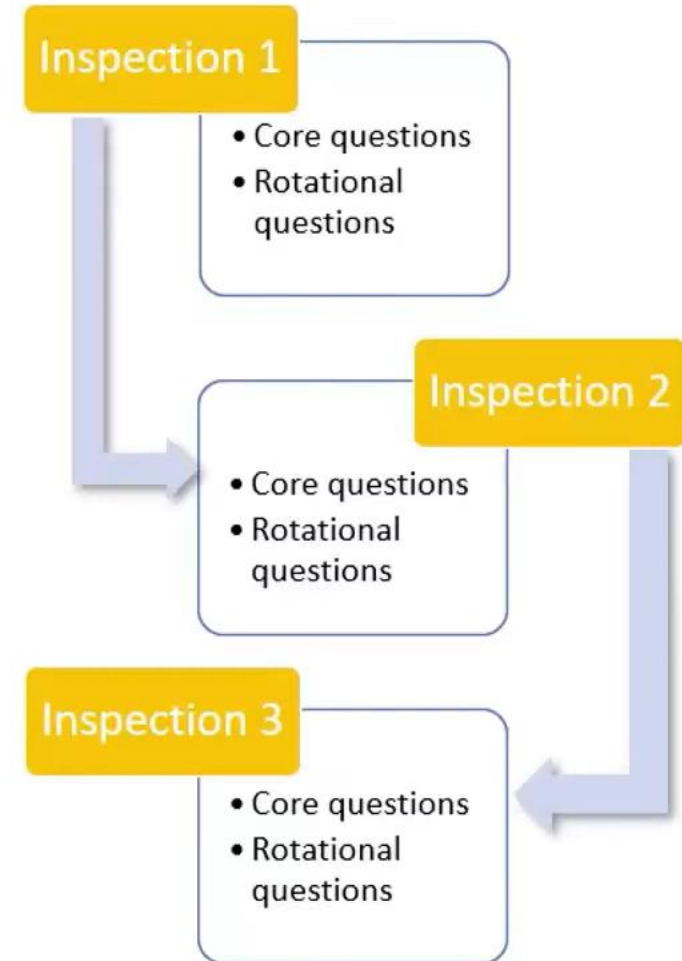
## Core questions

- Questions related to significant risk onboard are considered core.
- All core questions in the pool are added to the question areas first.

## Rotational questions

- Questions not related to significant risk are considered rotational.
- The remaining time per question area once core questions have been allocated are included on a rotational basis.

The compiler uses the Vessel's Inspection history to determine whether to include rotational questions and to ensure all applicable questions are asked over an appropriate time frame.




# How is the question structured?

- Rather than a simple Yes or No, a SIRE 2.0 question can be answered from a category perspective:
  - **Hardware**
  - **Process**
  - **Human**
- Category responses for a question can be set to either binary (Yes/No) or a graded scale.
- Each category has its own graded scale of responses.
- Each graded scale contains a single option which indicates a negative observation (e.g. Poor) and a range of positive options (e.g. Good, Moderate) allowing for a more nuanced response from the Inspector.
- Comments can be provided and are, in some cases, required (indicated by a speech bubble icon).



7.2.1  
Were the Master and officers familiar with the company procedures for hardening the vessel when entering areas of increased security risk, and was there a Vessel Hardening Plan (VHP) available?

Hardware ☐ NOT ANSWERABLE

YES	 NO
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Comments

Process ☐ NOT ANSWERABLE

PROCEDURE AND / OR CHECKLIST SIGHTED	 PROCEDURE AND / OR CHECKLIST SIGHTED	 PROCEDURE MISSING, INADEQUATE OR INACCURATE 1
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Comments

Human ☐ NOT ANSWERABLE

 EXCEEDED NORMAL EXPECTATION	AS EXPECTED	 LARGELY AS EXPECTED	 NOT AS EXPECTED 1
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Comments

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# What data is provided by the Vessel Operator to support the Inspection?

- **Vessel photographs**

- Vessel Operators are requested to upload a series of standard Vessel photographs to support the Inspection process.
- The photographs are presented to the Inspector who is asked to describe their validity.
- The Pre-Inspection Questionnaire feeds into the compiler providing a set of questions for the Inspection specific to the Vessel and cargo.

- **Vessel Certificates**

- **HVPQ**








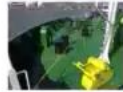




- **Crew Matrix**

- **PIQ questions**

- Selected questions are prepopulated with information extracted from the HVPQ and PIQ.



✕ Inspection Photos

 11.1.1	 11.1.2	 11.1.3
 11.1.4	 11.1.5	 11.1.6
 11.1.7	 11.1.8	 11.1.9
 11.1.10	 11.1.11	 11.1.12

PIQ Additional Information

PIQ - 7.2.1001 Does the vessel's usual trading area include entering or transit through areas of increased security risk?  
Yes

PIQ - 7.2.1002 Does the vessel always carry sufficient material to fully implement its Vessel Hardening Plan?  
Yes



# Bridging the gap between VIQ 7 and SIRE 2.0



# The Risk Based Approach

## The 'SWISS CHEESE' model.



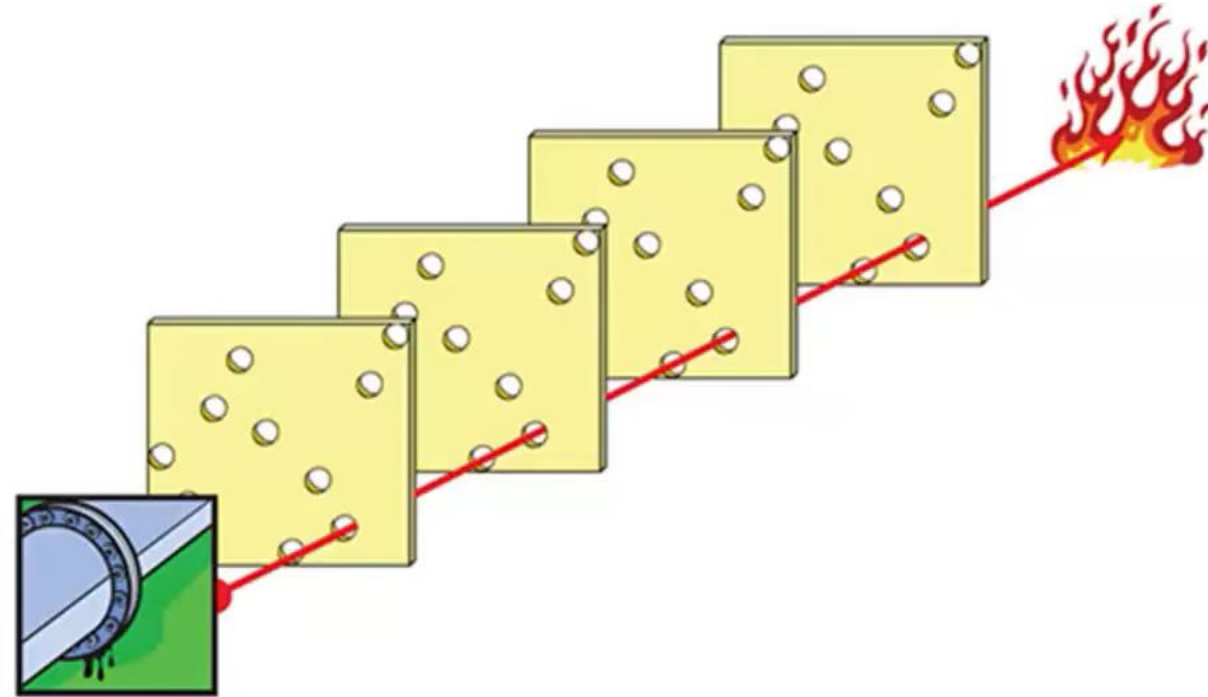
Risks can be mitigated by putting in place barriers and safeguards.



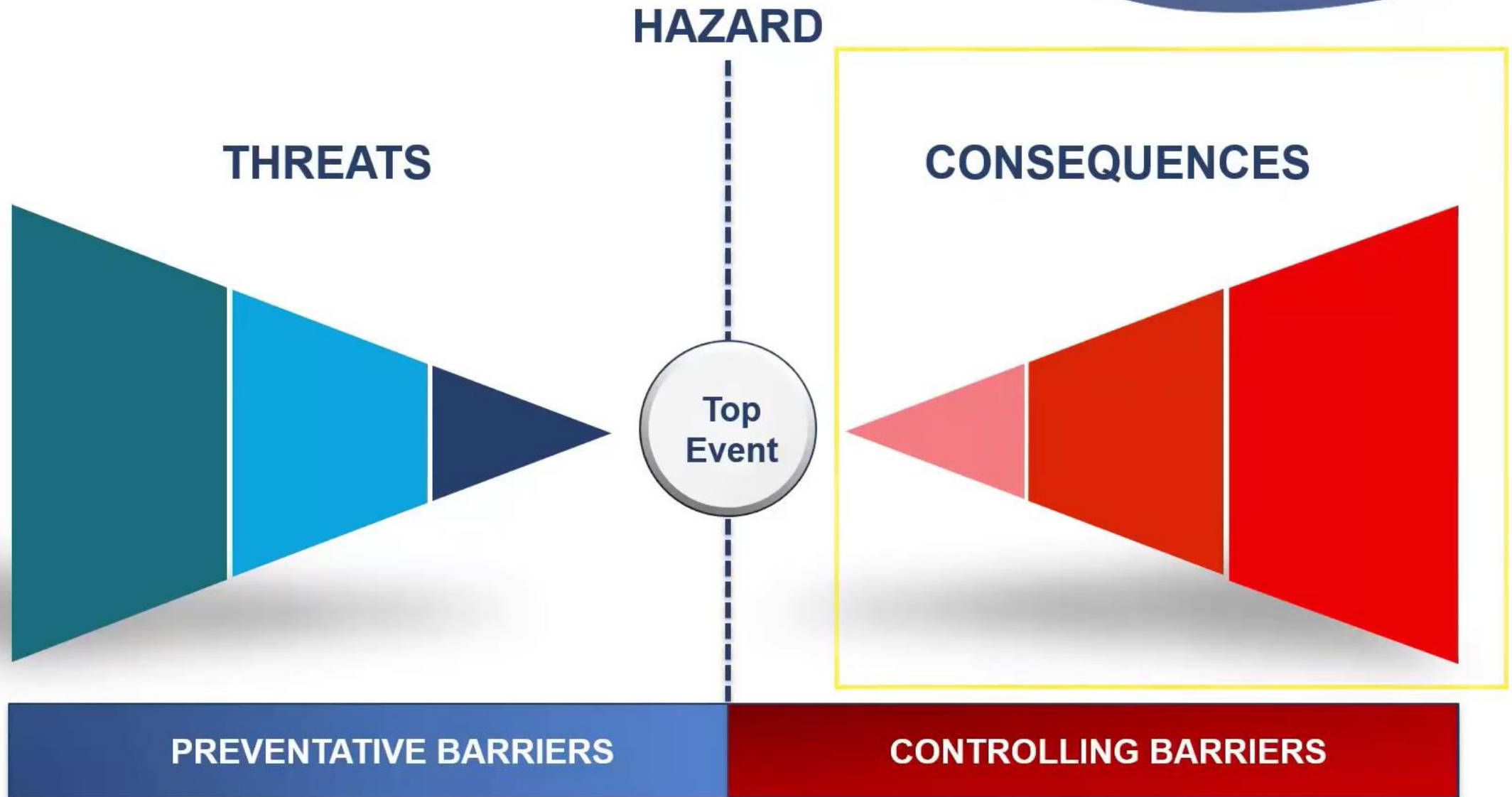
When an adverse event occurs, the important issue is not who caused the failure, but how and why the defences failed.



The pursuit of safety is not so much about preventing isolated failures, either human or technical, as about making the system as robust as is practicable in the face of its human and operational hazards.



# BOW TIE METHODOLOGY





# Development of a Bow Tie Diagram

## THREATS

Pipeline failure due to external corrosion

Response to spill and clean up

External corrosion Protection System

Pipeline failure due to over pressure (Temperature Change)

Cooling system Rated for max heat input.

Manual response to Pressure Switch Alarm

RV's Operational

Pipeline failure due to over pressure (ESD Upstream)

Containment Envelope

Manual Response to Pressure Switch Alarm

RV's Operational

## PREVENTATIVE BARRIERS

## HAZARD

Volatile Hydrocarbons under pressure in a Pipeline

Loss of Containment

TOP EVENT

## CONSEQUENCES

Fire Explosion Damage

Injuries to People

Spill of Hydrocarbons/ Environmental incident

## CONTROLLING BARRIERS

Leak Detection and Manual Isolation

Emergency Response Plan

Exclusion of People from the Fire Area

Evacuation of Personnel

Medical Team Response to Injuries

Leak Detection and Manual Isolation of Line

Response to Spill and Clean-up

# Development of a Bow Tie Diagram

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## PREVENTATIVE BARRIERS

Proactive actions

## HAZARD

Volatile Hydrocarbons under pressure in a Pipeline

Loss of Containment

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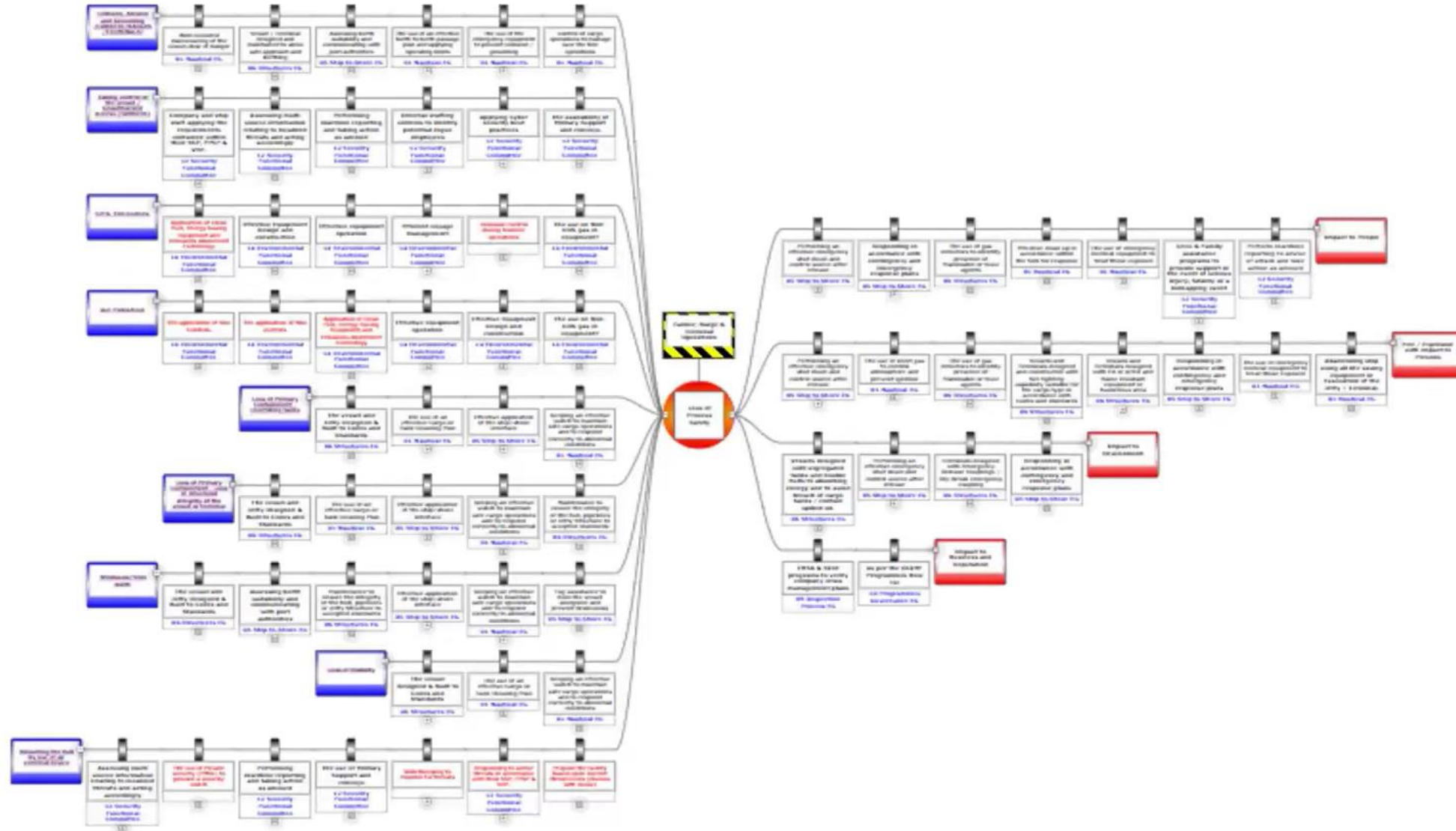
Response to Spill and Clean-up

Spill of Hydrocarbons/ Environmental incident

## CONTROLLING BARRIERS



# Actual Bow Tie Analysis for Loss of Process Safety



# An overview of inspection process

## CORE

These are the minimum questions required to meet the members' fundamental risk assessment criteria.

## Rotational

These are all those non-core questions that are included in the questionnaire over a defined period.

## Conditional

These are specific questions that are included based on the data available for the vessel, the operator, or the ship-type.

## Campaign

These are questions that cover areas of specific focus identified by OCIMF or its membership and will be included in all questionnaires over a limited time period.



# Identifying risk and critical activities

**1**  
CORE  
Questions

Barriers protecting CRITICAL activities – CORE questions will appear in every CVIQ

Once Critical activities had been identified, these were risks ranked in preparation for generating questions.

**2**  
Rotational  
Questions

Other activities linked to priority BARRIERS become Rotational Questions (Two Levels)



**3**  
Conditional

Help assess an operator's level of attainment against TMSA as declared in the PIQ

**4**  
Campaign

Permits response to emerging industry trends – by adding or upgrading ROTATIONAL questions.

- SIRE 2.0 **will not** follow a standard question set for each inspection
- Core questions will appear on **each** inspection question set
- Rotational Questions, will be rotated through subsequent inspections

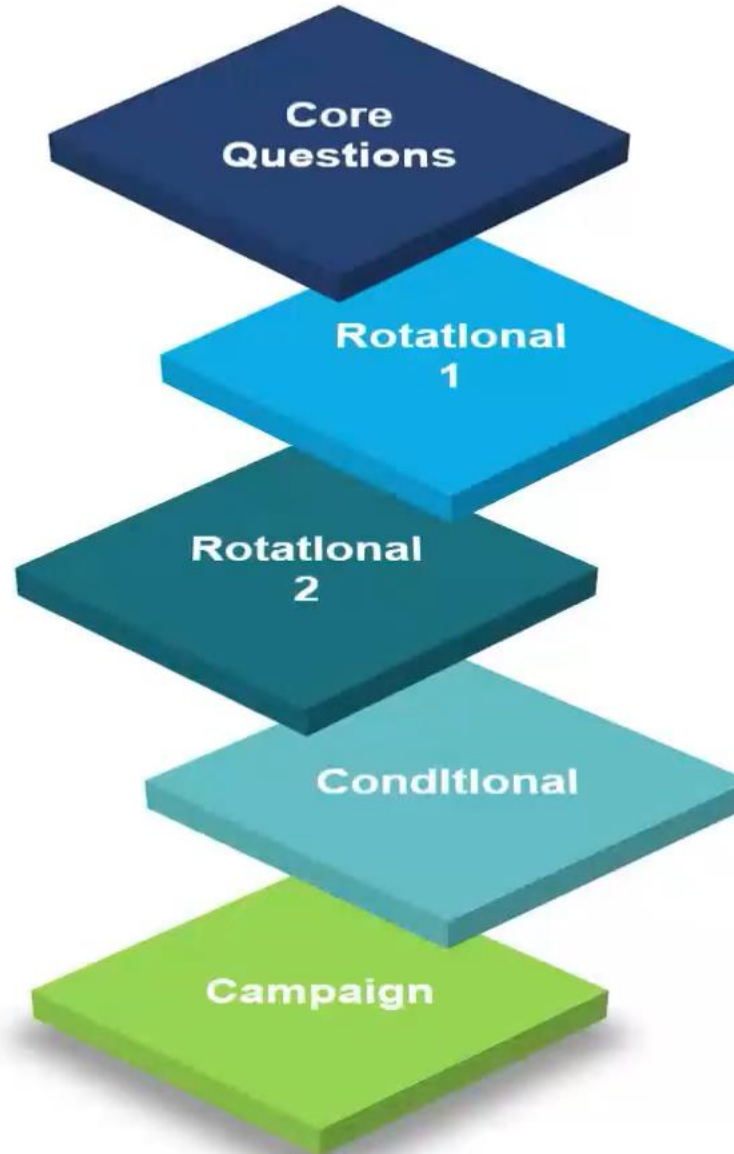


# SIRE 2.0 Questions

Question – Maintain the health of **PRIORITY** Barriers.

**CAMPAIGN** questions permits OCIMF to respond to emerging industry trends and issues by modifying the way the question set is managed and questions are allocated to individual inspections.

**CAMPAIGN** questions will be treated as CORE questions for the duration of the campaign period



**CORE** questions will be allocated to every inspection – applicable to vessel type and its operation.

**Rotational 1** Questions allocated approximately every third or fourth inspection.

**Rotational 2** Questions allocated approximately every sixth inspection.

**CONDITIONAL** These questions have been developed to assess a vessel operator's level of attainment against TMSA. These are known as conditional questions since they are allocated based on information provided by the vessel operator through the Pre-Inspection Questionnaire (PIQ).

# SIRE 2.0 Core Questions

Core Question – Maintain the health of **PRIORITY** Barriers.

CORE questions will be allocated to every inspection – applicable to vessel

Approximately half of the compiled questions will be CORE

CORE questions will be allocated for vessel type and operation – from PIQ declared information



Negative observations under CORE questions raised in the previous inspection will be detailed in the subsequent inspection – this ensures the weakness of critical activities are properly resolved.

CAMPAIGN questions will be treated as CORE questions for the duration of the campaign period



# Question structure and supporting guidance.



## Top level question

The wording gives a clear indication of what the question is intended to achieve and in most cases consists of several parts, **each** of which is essentially a question in its own right.



## Shortened question

A shortened version of the question appears in the chapter summary on the tablet screen, but as soon as the question is opened the full version is always displayed.

## Questions Structure

### Developed using Bow Tie Barrier Methodology

- Human element
- Procedural element
- Hardware element



## Objective

There is always an objective statement which summarises why a question exists – objectives can be termed as small guidelines that help achieve the goal at hand.



## Guidance

Question guidance to support the inspector in answering the question.



# Example of question structure and supporting guidance.



## Top level question

Were the Master and officers familiar with the company procedures for the safe operation of the ballast water management system (BWMS), and was the equipment in satisfactory condition and used in accordance with the company procedures and manufacturer's instructions?



## Shortened question

Ballast water management system (BWMS)



## Objective

To ensure that ballast is always handled safely in accordance with company procedures and manufacturer's instructions.

# Guidance Structure

## Industry guidance

- Industry best practice guidance.
- OCIMF publications and papers.
- TMSA – The most relevant KPI
- Rules and Regulations e.g SOLAS, MARPOL, IGC & IBC etc.

**NOT an exhaustive interpretation of Industry Guidance.**

## Inspector guidance

The guidance is used to provide a basic framework for what actions the inspector should consider when addressing the top-level question.

- Sight and where necessary review ...
- Inspect the visible part of .....
- Where necessary, review the maintenance records ...

## Expected evidence

This section identifies what evidence might reasonably be expected to be readily available when addressing the top-level question.

- Company procedures for the operation...
- The operation and safety manual for...
- Inspection and maintenance records of...

## Potential observations

One of the many clear benefits for SIRE 2.0 is a list of “Potential Grounds for **NEGATIVE** observations”.

This provides clarity to both the inspector and the operator.



[WWW.OCIMF.ORG/PROGRAMMES/SIRE-2-0](http://WWW.OCIMF.ORG/PROGRAMMES/SIRE-2-0)

A stylized illustration of a computer monitor with a dark blue frame and a matching stand. The monitor's screen is white and displays a URL in a black, sans-serif font. The URL is enclosed in a thin blue rectangular border. A black cursor icon, resembling a hand with a pointing finger, is positioned to the right of the text box. The background of the entire image is a solid light blue. At the bottom of the image, there is a horizontal white bar.





## Q&A

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