30th
International Maritime Lecturers Association Conference
Split Croatia
www.imla30.org

International Maritime Lecturers Association
FACULTY OF MARITIME STUDIES

# SHIP INSPECTION AND EVIDENCE OF EFFECTIVE TRAINING: THE CHALLENGES OF A NEW INSPECTION REGIME – SIRE 2.0

**Quentin N. Cox*, Mark Que, Hyacinth Jane Sales**

**Abstract.** ***Intro:*** Tracing the history and development of ship inspection regimes, there has been a salient targeting of oil tankers. This was no coincidence. For a while, these were the cargo ships with the most concerning safety record and of course, the political and social outfall from tanker incidents inevitably and understandably attracted negative publicity. The basis of any ship inspection has always been to reduce the risk of injury, damage and pollution of the environment (Chen et al 2022, p.3). ***Aims:*** This paper tracks the early evolution of pollution prevention regulation, as it became ever more entwined with the objectives of ship inspection regimes. Of particular focus in this paper, the history and development of the human element, as it gained further prominence in both recognized good practice and indeed legislation. Evidence of such prominence is given by way of references to relevant regulation as well as non-mandatory applications such as Tanker Management Self-Assessment (TMSA) and Ship Inspection Reporting (SIRE) inspections. ***Methods:*** Attention toward the latter sections of the paper is given to the new SIRE 2.0 approach to ship inspection and the incorporation of the Human Element. Furthermore, it debates the efficacy of training, in particular, the efficacy of short-course specialist training. Ship charterers, especially within the tanker domain, often require crews of ships considered for charter, to have undertaken a list of specialist short-courses. The wider debate of the application of training and the assessment of such trainees is also included. ***Results:*** The results of the discussion indicate the means by which safety standards and the protection of the environment can be enhanced and the role ship inspection regimes play in this aspiration. ***Conclusion:*** The re-alignment of the approach of SIRE 2.0 demonstrates a willingness to be flexible in its approach to meeting the objectives of ship inspection.

**Keywords:** Ship Inspection; Human Element; Training; Flexibility.

Philippine Centre for Advanced Maritime Simulation and Training, 2nd Floor, First Maritime Place, 7458 Bagtikan St, San Antonio Village, Makati City, Philippines

* **Corresponding author:** quentincox@rocketmail.com

https://doi.org/10.7225/imla30.08

## 1. HISTORY OF POLLUTION PREVENTION REGULATION

Until the 1950s there were very few articles of legislation related to the prevention of pollution.

> "The OILPOL 54 Convention, formally known as the International Convention for the Prevention of Pollution of the Sea by Oil, was a significant step in marine environmental protection when it was adopted in London on May 12, 1954. It was the first international treaty specifically aimed at addressing the issue of oil pollution in the oceans.
>
> The Convention was groundbreaking for its time, setting forth regulations to control ships' discharge of oil and oily mixtures into the seas. It introduced stringent measures, such as the requirement for ships to maintain an Oil Record Book to log ballast and oil discharges, and the practice was inspected and enforced by the flag state of the vessel."

One factor which stimulated the growth in the trading of crude oil, was the thirst for gasoline, as car ownership increased in the post-war years within the developed world and beyond. Inevitably, this increase in traffic led to further incident.

As a result, the tanker industry faced increasing legislative requirements in 1962, 1969 and 1971. However, it was the grounding and subsequent pollution of the crude oil tanker Torrey Canyon in 1967 which eventually led to a completely overhauled set of regulations in the form of the MARPOL Convention of 1973. These regulations broadened the reach of the legislation to include pollutants other than oil, such as chemicals, hazardous substances, sewage, garbage and ultimately atmospheric emissions. Each category formed an Annex of the MARPOL Convention, though it was several decades before they were each enforced.

At the time, regulations focused on what we would now term the hardware, that is the equipment and machinery as well as the way the ships and cargoes were managed.

Even after the wide-ranging MARPOL '73 Convention was introduced, though Annex 1 (Oil) not implemented until 1983, international authorities did not feel the scope of the regulations stretched far enough. In February of 1978 a "Presidential Ultimatum" was made by the then US President Jimmy Carter, to tanker owners to "clean up their act".

> "The Protocol applied many new operating and construction standards to more tankers than are covered by the International Convention for the Prevention of Pollution from Ships, 1973 (the MARPOL Convention)" (Carter 1978).

The statement was partly a reflection on pollution occurring in waters adjacent to the USA but was aimed more generally at tanker operations globally, which consistently resulted in avoidable pollution.

Thus, the Protocol of 1978 was introduced to MARPOL which subsequently became referred to as MARPOL 73/78. Yet within matter of weeks of this protocol being acknowledged, another major pollution incident occurred on the northern coast of France, when the Amoco Cadiz**,** lost steerage in heavy weather and ran aground. Over 200 000 tonnes of oil polluted the environment. This particular incident led to amendments to the SOLAS Convention requiring secondary steering motors.

## 2. THE INTRODUCTION OF THE HUMAN ELEMENT WITHIN LEGISLATION

However, the philosophy of the regulatory authorities started to change in the same year, 1978, when the first STCW Convention was introduced. This was the first acknowledgment within maritime regulation, of the Human Element, recognizing both the personnel operating the ships and the equipment.

> "The first OCIMF Ship Inspection Reporting Program (SIRE) appeared in 1993, with the purpose of introducing an element of uniformity to ship vetting. This was in response to a perceived lack of equity amongst ship owners having been subject to a multitude of inspections by that stage. There was a widespread concern that standards varied markedly across the world." (Knapp and Franses, 2010, p.4)
>
> "In 2001 SIRE as a quality management system (QMS) became ISO 9002:1994 certified and got revised to the updated version ISO 9001:2015 in 2018 (OCIMF). As of 2020 OCIMF consist of 110 members located in 45 countries and since the launch of SIRE, the system has been a part of over 180000 ship inspections (OCIMF, 2022c), now being widely considered as one of the global industry standard tools for vetting procedures" (Montenegro and Nylund 2023 p.5).

Since then, the Human Element has gained traction within maritime regulations, especially STCW. Major overhauls of 1995 distinguished between operational and managerial levels in certain disciplines and the 2010 amendments mandated Human Element training.

In the meantime, inspection routines from a swathe of legislative and advisory bodies, such as Flag State, Port State, Chemical Distribution Institute (CDI), Tanker Management Self-Assessment (TMSA) and for bulk carriers, Rightship became increasingly

stringent. The TMSA in particular associated good practice aligned with Key Performance Indicators. Without digressing extensively, the lowest level of accreditation within the TMSA indicates the mere application of the ISM Code via the company SMS. Evidence of higher standards of practice is required for a higher level of accreditation. As implied, standards relating to commercial aspects of their operations are scrutinized in more detail, over and above mere regulatory standards. In fact, for that reason the head offices of ship owners are subject to examination by prospective charterers as well as the ships themselves.

> "As a result of the joint efforts within the tanker segment, the number of tanker accidents since the 1970s have significantly decreased, going from an average of roughly 78 accidents per year, to an average of six accidents (ITOPF, 2023)" Montenegro and Nylund 2023, p.1).

Fatal incidents such as that suffered by the Bow Mariner in 2004, in which the human element played a significant part by way of perceived dictatorial management on board, also contributed to the discussion of the Human Element in commercial shipping.

The SIRE inspection regime started in 1993 with the aim, as has been the case with most other equivalents, to reduce the risk in the operation of ships and tankers, in particular. Unlike certain legislative inspection regimes, however, the SIRE arrangement allowed commercial enterprises such as terminals and prospective charterers to view their reports (Grbić et al 2018, p.360). In a commercial context, access to these SIRE reports may form the first step in the process of a charterer considering a ship for a charterparty. The recent change in approach which has led to the introduction of SIRE 2.0 takes the human element approach even further than many which have preceded.

## 3. THE NEW SIRE 2.0

The focus of inspection exceeds the routine examination of documentation and certification. It emphasizes the importance of the human / equipment interface. OCIMF now list 10 Performance Influencing Factors.

The PIFs consist of organisational, social, psychological, and physical characteristics that can affect human performance. OCIMF has summarised the PIFs which they find to be the most relevant to vessel operation as follows (Table 1):

**Table 1.** Performance Influencing Factors OCIMF SIRE 2.0

| | |
|---|---|
| 1 | Recognition of safety Criticality of the task or associated steps |
| 2 | Custom and practice surrounding use of procedures |
| 3 | Procedures accessible, helpful, understood, and accurate for tasks |
| 4 | Team dynamics, communications, and coordination with others |
| 5 | Stress, workload, fatigue, time constraints |
| 6 | Morale, motivation, nervousness |
| 7 | Workplace ergonomics including signage, tools, layout, space, noise, light, heat, etc. |
| 8 | Human-machine interface (Controls, Alarms, etc.) |
| 9 | Opportunity to learn and practice |

Source: OCIMF, 2023b

As can be noted from this list, the emphasis is on assessing how these influencing factors can affect performance of the tasks involved in running the ship safely and with due regard to the environment.

On their own web pages OCIMF themselves explain that,

> "Human factors are the physical, psychological and social characteristics that affect human interaction with equipment, systems, processes, other individuals and work teams. Taking a human factors approach means recognizing that it the people on the ships and in the operations and support teams who make safety work, was but that human error still occurs in interaction with conditions, systems and / or other people. It is by addressing these interactions, that we can reduce human error and so, reduce incidents and improve reliability and productivity" (OCIMF SIRE 2.0).

## 4. CREW INTERVIEWS

One specific aspect of the new SIRE 2.0 approach is that the inspectors will spend more time interviewing the crew members, for the purposes stated above.

At first glance, this approach and associated list may intimidate crew members, in advance of a SIRE 2.0 inspection. Yet it is not the intention of the inspector to create such an impression. OCIMF state quite clearly, "We respect and support the crew". The objective of this approach is to identify processes which may need attention. For example, if an interview yields gaps in the technical knowledge of the crew member, it is not the intention of the inspection to focus on the shortcomings of the individual. Such an event

will be perceived, it is intended, as a shortcoming of the process leading to the gap identified. To paraphrase, it is the 'process not the person' which will need attention.

Also, bearing in mind the human factors listed in the 10 Performance Influencing Factors, the crew members being interviewed will not necessarily be expected to demonstrate evidence of these factors. However, discussions between the inspector and the various crew members may well expose or highlight certain social elements or human factors which could require closer focus. For example, procedures which are unclear or ambiguous could be highlighted or even friction between departments, which may lead to underperformance. As the new approach is described by OCIMF, the intention is to reduce risk by all reasonable efforts including human factors and not simply on the basis of existing documentation, training certification and the state of the equipment.

The objective is merely to reduce risk and by asking the crew to articulate an understanding of their duties, with particular respect to the working of equipment and machinery. This is intended to be an indication of reduced risk whereas in the past, mere evidence of a training completion certificate may have sufficed.

This leads to two pertinent discussions, firstly the role of training and secondly the practice of interviewing crew members. In fact, the two discussions could be intertwined.

Despite the impression given by OCIMF with regard to what appears to be a novel approach to inspection, regarding the interviewing of ship staff, the reality is that this is nothing particularly new. Chemical tanker staff, inspected under the Chemical Distribution Institute (CDI) regime in the past, have been used to such an approach from inspectors for many years. In fact, it would not be especially unusual for seafarers undergoing Port State or Flag State inspections to be subject to the same scrutiny. The major difference with the new OCIMF approach is that there is greater emphasis on the inspectors not to intimidate sea staff and also and this is the novel aspect, the inspectors themselves are to be provided with human factor training for that very purpose.

However, dealing with the two discussions in the sequence in which they have been introduced, let us start with a discussion on the subject of training.

There is nothing at all novel about training regimes. In excess of 170 different flag states approve all manner of long and short course training and indeed there is a thriving market for non-mandatory training. This is especially the case where specialist type of ships or cargoes are involved.

As an example and to relate back to requirements favoured by charterers, many now have a requirement for staff on tankers to undergo regular, non-mandatory cargo simulator courses.

## 5. THE EFFICACY OF NON-MANDATORY TRAINING AS EVIDENCE OF SELF-ASSESSMENT

Commercial inspections such as those related to SIRE and CDI from the past, have taken note of crew members' generally short course specialist training and accompanying certification. In fact, a number of companies aim to satisfy, for example, the TMSA requirement to provide evidence of self-assessment of their staff in this way (Stathoulopoulos 2022, p.35). Yet the cynic may well ask, is the requirement simply to show a course certificate?

In many cases the answer to this question is, yes, that's all. This may go some way to explaining the attitude of some trainees as well as their employers, during the delivery of training courses, where practical assessment is either decidedly impractical or simply omitted to the satisfaction of the client. All each stakeholder needs is a course completion certificate. The employer requires that to show ship inspectors. As long as the employee can leave the training institution with such a certificate, then every requirement has been met.

The next question is, how do trainees achieve a 'pass' during their course assessments, if they do not learn anything during the delivery? To deduce how they achieve this involves a consideration of one of the most widespread type of course written assessment, the ubiquitous Multi-Choice Question (MCQ) papers.

> "It might be claimed that their ease of use and testing efficiency comprise the sole rationale for their continued use" (McCoubrie, 2004, p.709)

Poorly constructed questions and distractors can lead to results not reflective of the competence of those being assessed. Concerns have also been expressed regarding academic rigour of MCQs.

> "The use of MCQs is usually driven by the need for teacher efficiencies and the provision of rapid feedback rather than by robust pedagogical principles aimed at encouraging effective learning" (Nicol 2007, p.54).

Despite the approval of many within the Maritime Education and Training domain favouring the use of MCQs, for assessment purposes, it is also clear that there has been widespread concern expressed regarding the efficacy of such an assessment method.

Amongst them, as cited above, were concerns about just academically robust they can be. There appears to be a widespread acceptance of their efficiency but less on their contribution toward evidence of learning outcomes being achieved. A commonly expressed concern is that this type of assessment does not lend itself to the higher order thinking skills espoused by Bloom's Taxonomy (Drown et al. 2013, p.6).

The association with the point earlier about training, is that it is not inconceivable that candidates are able to pass these MCQ assessments by good fortune rather than demonstrating a profound understanding of their topic. A seasoned trainee may adopt an effective strategy to approaching an MCQ paper especially if the authors of such papers are inexperienced in their composition. For example, the answer key may be cited within the stem of a question, the correct answer is the longest option, if in doubt it's option c. (Torres et al. 2011, p.6)

Another aspect of training that has been a mystery for as long as training has existed is why it is not applied. As an example, let us consider the fatal consequences of seafarers entering enclosed spaces without applying guidance. This is highlighted in IMO Resolution A.1050(27) "Revised recommendations for entering enclosed spaces aboard ships".

> "Investigations into the circumstances of casualties that have occurred have shown that accidents on board ships are in most cases caused by an insufficient knowledge of, or disregard for, the need to take precautions rather than a lack of guidance". (Resolution A.1050(27) p2.)

The statement acknowledges that guidance has been given, the plethora of such training courses and advice in just about all ship related advice is testament to that, such as the Tanker Safety Guides and the Code of Safe Practice for Merchant Seafarers. So if guidance has indeed been provided, the question remains, why has the advice not been applied? It is perhaps the role of the incident investigation processes to ascertain this but the change of approach by SIRE 2.0 to assess the knowledge of seafarers, including of such procedures aligns with the aspiration of reducing risk.

## 6. THE MECHANISM OF RISK REDUCTION SIRE 2.0 STYLE

This leads into the second element of the discussion, associated with how the change in approach of SIRE 2.0 aims to reduce the risk posed to the crew, the ship and the environment. Whereas previous inspection regimes focused on documentation to verify the workings of the ship, both in terms of the equipment and the seafarers, more substantial evidence can be identified by asking the ship staff to articulate their understanding.

The assertion that SIRE 2.0 inspections will involve more time spent interviewing crew members is not especially revolutionary. The changes cited may mean there may be a difference between earlier SIRE inspections and the new, yet there is nothing particularly unusual about any ship inspection incorporating interviews with crew members.

So, having introduced the most salient factors within this discussion, let us take a step back and review the apparent existing situation and reflect on what has led up to this point.

Largely due to the profound effects and aftermath of tanker incidents, during the middle years of the previous century, one might ask Why change was necessary. Perhaps there was a sentiment that the previous approach was not as effective as desired. The new SIRE 2.0 claims a different approach to reducing risk. They cite more focus on the human element with respect to sea staff demonstrating an understanding of their duties and responsibilities, with particular respect to the operation and maintenance of equipment. Their approach encompasses the philosophy that "We respect and support the crew" (OCIMF SIRE 2.0)

> "For example, the Ship Inspection Report (SIRE) programme is a tanker risk assessment tool and vessel inspection report database with the purpose of continually improving operational safety" (Siali and Bertnsson 2023, p.2)

The crew do not necessarily have to display the Human Factors to the satisfaction of the inspector though the answers to the questions may help the inspector gauge such elements. Note the 10 Performance Influencing Factors identified by OCIMF.

For this reason, inspectors are expected to undergo Human Factor training. They are not there to intimidate crew members, simply to help identify areas for improvement.

The objective is merely to reduce risk and by asking the crew to articulate their duties, with particular respect to the working of equipment and machinery. This is recognized as being an indication of reduced risk whereas in the past, mere evidence of a training completion certificate may have sufficed.

This point is the central focus of this paper, that by verifying that the ships' crews are able to articulate and demonstrate an understanding of their role, they are thereby indicating, to some extent that their training has been successful and that they are able to apply their training.

Whilst this technique, as suggested, is nothing especially innovative, the approach by SIRE 2.0 is likely to make a beneficial impact on Maritime Education and Training, for the very reason that training completion certificates should have some meaning. As articulated by OCIMF themselves, no longer will a training certificate alone be sufficient to demonstrate compliance. Training will have to havebeen understood and implemented. Again, it is worth making the point that any gaps in apparent knowledge or ability indicated by the individual may not be a reflection of the individual in isolation but maybe an indication of a gap in the management of training.

With the rationale explained, the inspectors' aims are to identify any gaps in training, rather than gaps in an individual's knowledge. The aim would be to improve the process which enabled the breaches to occur.

Risk management and endeavours at risk reduction is not unique to the shipping industry.

> "Behavioural management theory such as the Hawthorne studies later merged with scientific management resulting in what is sometimes called modern management focusing both on the systematic management methods while taking the human factor into account (Uddin & Hossain 2015, p.578)".

OCIMF claim to making the tanker inspection process "future proof" by digitizing inspections. This means data, in terms of answers, observations and pictures, will be recorded in real time, during the inspection rather than afterwards. In fact, sensors are provided within the inspectors' tablets to monitor the time spent on board as well as the distance walked around the ship during the inspection. "The inspection program will be risk-based and is meant to be easily updated to adapt to emerging risk trends or new regulation". (OCIMF 2023).

They elaborate further by explaining that the human factor part of the assessment is implemented to try to understand if a task can be executed correctly in the future. "For the inspector to decide which response a task deserves on the five graded response scale, they use the Performance Influencing Factors (PIFs) to assess what factors that might affect the person carrying out the task" (OCIMF 2023).

Furthermore, it is intended that good practice will be highlighted. Questions will be selected on the basis of the vessel's operational history, cargo and equipment on board. Rather than a binary response (yes or no), a five-level answer ranging from 'Not as Expected' to 'Exceeded expectation' will be introduced. The inspector may go beyond a simple 'Yes' in order to identify and praise good practice.

It may be argued that this change, which permits the identification of good practice is equally as progressive as the not altogether novel introduction of crew interviews. In any evaluation process, the suppliers of a product genuinely seek feedback in order to address negative reflection and improve their product. It is quite logical to focus only on negative feedback, since that is where opportunities to improve will be highlighted. Yet by neglecting positive feedback and the acknowledgement and appreciation of good practice, then the suppliers may not be able to recognize the best practices or at least those appreciated most by their consumers. Within the context of ship inspection, again the responsible operators want correct the errors but without having best practices identified, they rely on the inference that what they are already doing must be satisfactory, in the eyes of the inspectors, if they are not told otherwise.

A reflection from another industry advisory group INTERTANKO, incorporates an explanation about the purpose behind SIRE 2.0 aligned with the views of OCIMF, while adding that the human factor aspect has high priority in their organization. They recognized thar SIRE 1.0 had been applied for around thirty years and as such there was a need to upgrade to align with new technology, approaches and ideas. The new approach more focused on the work of the people, aligns with the INTERTANKO philiosophy.

> "It's about making sure the seafarers are doing the right job, have the right tools, have the right equipment, are working in a safe environment, are able to do the job that is their task to do and also, it's not just about the negative side. Now there's also scope for putting the positive side in there. So, if the inspector sees that some seafarers are doing a very good job. They can write a positive comment into the report, and previously it was all negative. It was all about the negative side" (INTERTANKO)

The final point enhances the value of the recognition of good practice rather than focusing solely on the negative, underpinning the points made earlier.

## 7. PSYCHOLOGY OF INSPECTORS

Under SIRE 2.0, inspectors are no longer passive observers but are expected to conduct more conversational, behaviorally grounded interviews with seafarers. This shift requires inspectors to integrate principles from human factors psychology, including cognitive load, stress response, communication dynamics, and power distance sensitivity (Flin, O'Connor, & Crichton 2008, p.112).

One key consideration is the need for psychological safety—a concept introduced by Amy Edmondson (1999, p.350)—which asserts that individuals are more likely to speak candidly and acknowledge mistakes when they do not fear punitive consequences. Inspectors must create a low-threat atmosphere that fosters openness, which entails:

- Using open-ended, nonjudgmental language (e.g., "Can you walk me through what happens during this process?" instead of "Why didn't you follow the checklist?")
- Applying active listening and nonverbal reassurance to reduce anxiety (Mehrabian 1971, p.4)
- Being aware of hierarchical dynamics, especially in high power-distance cultures like the Philippines or India (Hofstede, 1983), where subordinates may avoid expressing concerns or failures in front of higher-ranking officers.

To avoid intimidation while still obtaining useful information, inspectors can employ motivational interviewing techniques (Miller & Rollnick 2013, p.2), which involve collaborative conversation, affirming autonomy, and guiding rather than pressuring responses. This technique also aligns with SIRE 2.0's behavioral expectations approach.

### Identifying Red Flags for Friction

Human factors also guide inspectors in identifying interpersonal tension or breakdowns in Bridge Resource Management (BRM) and Engine Room Resource Management (ERM). Signals of friction include:

- Inconsistent or vague responses between team members
- Avoidance of eye contact or interaction between senior and junior officers
- Hesitation or repeated deferral to others for answers
- Over-dependence on a single individual for operational information

These behaviors may point to communication silos, role ambiguity, or interpersonal distrust, all of which are risk factors for human error, as identified in the OCIMF's Performance Influencing Factors (PIFs) framework.

## 8. PSYCHOLOGY OF INTERVIEWEES

Crew members often associate inspections with deficiency-finding, which conditions them to approach these encounters defensively (Reason 1998, p.293). This is partly explained by learned helplessness theory (Seligman 1972, p.407), where repeated negative evaluations lead to resignation or disengagement. Combined with authority bias (Milgram 1963, p.371) and high power-distance norms (Hofstede 1983, p.75), seafarers may view the inspection as an audit to be feared.

### Changing the Narrative: Appreciative Inquiry and Positive Reinforcement

To shift this perception, SIRE 2.0 must embody elements of Appreciative Inquiry (Cooperrider & Srivastva 1987, p.129), focusing on identifying and amplifying what works well. Inspectors should be encouraged to:

- Verbally acknowledge best practices or well-followed protocols
- Share examples of excellent performance with the crew and shore-side managers
- Frame feedback in terms of development and safety, not merely compliance

This practice aligns with self-determination theory (Deci & Ryan 2000, p.227), which states that recognition and autonomy contribute to motivation and engagement.

Moreover, incorporating feedforward mechanisms (Goldsmith 2002, p.11) where the focus is on future improvement rather than past mistakes, can make crew members feel supported rather than scrutinized.

Furthermore, recent studies by Orhan and Celik (2023, p.1) suggests human factors such as human performance, safety administration and management are affected by a series of managerial control mechanisms. Amongst these are situational communication and awareness, inadequate knowledge of procedures and standards. Additionally, inadequate supervision, the lack of understanding of roles and responsibilities and poor maintenance regimes have had the potential to "lead to the occurrence of deficiency items. Considering the dimension-based distributions of causes, the study highlights integrated preventive action recommendations specific to the analysed deficiency cases" Orhan and Celik (2023, p.1). The deficiency cases referred to provide a direct association between the management of safety on board and the type of inspection espoused by SIRE 2.0, in terms of a proactive approach to avoid future incidents.

## 9. CONCLUSION

For SIRE 2.0 to succeed as a human-centric model, inspectors must act as both evaluators and facilitators of safer practices. A sound understanding of psychological principles—especially those related to authority, stress, and communication—will be essential. Equally, crews must be helped to reframe inspections as col-

laborative conversations where good practices are not only recognized but celebrated.

One final passing thought; the number of articles quoting that 80% or so of shipping incidents are caused through human error (Wróbel 2021, p. 107942) is quite extraordinary. What is less clearly understood is that most of that statistic is due to a lack of effective communication amongst a team, bridge team, engine room control team, cargo control room team. That is the problem which needs attention. The attempts by SIRE 2.0 to root out these human issues is commendable.

## REFERENCES


Chen, Y., Lou, N., Liu, G., Luan, Y. and Jiang, H., 2022. Risk analysis of ship detention defects based on association rules. *Marine Policy*, *142*, p. 105123. https://doi.org/10.1016/j.marpol.2022.105123

Cooperrider, D. L., & Srivastva, S., 1987. Appreciative inquiry in organizational life. *Research in Organizational Change and Development*, 1 p. 129–169. https://doi.org/10.1108/s1475-9152(2013)0000004001

Convention on Pollution From Ships Message to the Senate Transmitting a Protocol to the Convention. | The American Presidency Project [Accessed 18th May 2025]

Deci, E. L., & Ryan, R. M., 2000. The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Drown, D., Mercer, R. and Jeffery, G., 2013. MULTIPLE CHOICE MYSTERIES: The Effectiveness of Multiple Choice Question Assessment in Maritime Education and Examination. *21st International Maritime Lecturers Association Conference (IMLA 21)* Fisheries and Marine Institute of Memorial University of Newfoundland October 9-12, 2013. https://doi.org/10.21677/imla2021.02

Edmondson, A., 1999. Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350–383. https://doi.org/10.2307/2666999

Flin, R., O'Connor, P., & Crichton, M., 2008. *Safety at the sharp end: A guide to non-technical skills*. CRC Press. https://doi.org/10.1201/9781315607467

Goldsmith, M., 2002. Try feedforward instead of feedback. *Leader to Leader*, 25, 11–15. https://doi.org/10.1002/ltl.25

Grbić, L., Čulin, J., & Perković, T., 2018. SIRE inspections on Oil tankers. TransNav: International Journal on Marine Navigation and Safety of Sea Transportation, 12(2). https://doi.org/10.31217/p.32.1.13

Hofstede, G., 1983. The cultural relativity of organizational practices and theories. *Journal of International Business Studies*, 14(2), 75–89. https://doi.org/10.1057/palgrave.jibs.8490867

Knapp, S. and Franses, P.H., 2010. Comprehensive review of the maritime safety regimes: present status and recommendations for improvements. *Transport reviews*, *30*(2), pp. 241-270. https://doi.org/10.1080/01441640902985934

Mehrabian, A., 1971. *Silent messages*. Belmont, CA: Wadsworth. https://doi.org/10.4324/9781351308724

McCoubrie, P., 2004. Improving the fairness of multiple-choice questions: a literature review. *Medical teacher*, *26*(8), pp. 709-712. https://doi.org/10.1080/01421590400013495

Milgram, S., 1963. Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, 67(4), 371–378. https://doi.org/10.1037/h0040525

Miller, W.R. and Rollnick, S., 2012. *Motivational interviewing: Helping people change*. Guilford press. p. 2. https://doi.org/10.1097/01445442-200305000-00013

Montenegro, M. and Nylund, L., 2023. Navigating the Human Factor: A comprehensive study of the tanker industry. https://doi.org/10.1201/b20088-9

Nicol, D., 2007. E-assessment by design: using multiple-choice tests to good effect. *Journal of Further and higher Education*, *31*(1), pp. 53-64. https://doi.org/10.1080/03098770601167922

https://www.ocimf.org/programmes/ [Accessed 18th May 2025])

Orhan, M. and Celik, M., 2023. A Fuzzy Cognitive Mapping Approach to Conduct Deficiency Investigation under SIRE 2.0 Inspection. *Transactions on Maritime Science*, *12*(02) p. 1. https://doi.org/10.7225/toms.v12.n02.001

Reason, J., 1998. Achieving a safe culture: theory and practice. *Work & stress*, *12*(3), pp. 293-306. https://doi.org/10.1080/02678379808256868

Seligman, M.E., 1972. Learned helplessness. Annual review of medicine, 23(1), pp. 407-412. https://doi.org/10.1146/annurev.me.23.020172.002203

Siali, M. and Bertnsson, I., 2023. How New Demands Change an Organisation: A Case Study of SIRE 2.0. https://doi.org/10.4018/9781605666525.ch069

Stathoulopoulos, K., 2022. *Tanker management-Self assessment* (Πανεπιστήμιο Πειραιώς) p. 35. https://doi.org/10.1007/978-0-85729-410-4_520

Torres, C., Lopes, A.P., Babo, L. and Azevedo, J., 2011. Improving Multiple-Choice Questions. *Online Submission*. https://doi.org/10.1002/9781444391770.oth1

Uddin, N., & Hossain, F., 2015. Evolution of modern management through Taylorism: An adjustment of Scientific Management comprising behavioral science. Procedia Computer Science, 62, 578-584. https://doi.org/10.1016/j.procs.2015.08.537

Wróbel, K., 2021. Searching for the origins of the myth: 80% human error impact on maritime safety. *Reliability Engineering & System Safety*, *216*, p. 107942. https://doi.org/10.1016/j.ress.2021.107942