



Human Factors: Management and Self Assessment

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Our vision is a global marine industry that causes no harm to people or the environment.

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Bibliography/additional resources

OCIMF ISGOTT (chapter on human factors).

The OCIMF Human Factors Approach.

OCIMF *Mooring Equipment Guidelines* (section on human factors).

Human Error, James Reason.

Pre-Accident Investigations, Todd Conklin.

The 5 Principles of Human Performance, Todd Conklin.

Safety-I and Safety-II, Erik Hollnagel.

The Safety Anarchist, Sidney Dekker.

The Field Guide to Understanding 'Human Error', Sidney Dekker.

The Field Guide to Human Error Investigations, Sidney Dekker.

The International Oil and Gas Producers Association (IOGP) provides guidance on improving human factors in investigation as well as learning from incidents. Search www.iogp.org/ for:

- Report 621 *Demystifying Human Factors: Building Confidence in Human Factors Investigation.*
- Report 552 *Components of Organizational Learning from Events.*

The Energy Institute operates a learning pathway for individuals to learn theory and carry out practical human factor exercises in their own workplace. The pathway leads to membership of the Chartered Institute of Ergonomics and Human Factors (CIEHF). For more, search for 'human performance in the energy sector' at www.energyinst.org/

CIEHF is also a good resource if a company wants to find expertise, with directories of qualified human factor professionals and consultancies. The resources for locating expertise are at www.ergonomics.org.uk/ The UK Health and Safety Executive has extensive guidance for companies wanting to know more about workforce representatives. Search for 'consulting and involving your workers' at www.hse.gov.uk

Introduction

This information paper provides a framework to integrate human factors into management systems in line with OCIMF's commitment to consider human factors in everything we do. Although it has been developed under the same principles as OCIMF's TMSA 3 publication, it is currently not integrated under the TMSA 3 umbrella. These KPIs are intended to be included in future editions of TMSA.

Human Factors

Main objective

To help companies and leadership teams address the conditions and systems that influence human actions and decisions, and so promote safety and excellence across all operations.

About human factors

Safe and efficient tanker operations depend on skilled and capable people carrying out their tasks properly. When incidents occur, they are often attributed to human error, but most mistakes, actions and decisions are themselves the result of the way the workplace is set up, how work is designed, equipment and control measures, and how leaders influence the culture in an organisation.

Human factors are the physical, psychological and social characteristics that affect human interaction with equipment, systems, processes, other individuals and work team(s).

Taking a human factors approach means recognising that it is the people on our ships and in our operations and support teams who make safety work, but that human error still occurs in interaction with conditions, systems and/or other people. By addressing these interactions, we can reduce human error, and so reduce incidents and improve reliability and productivity.

An industry learning together

Human factors is new to many in the industry. The key performance indicators (KPIs) and best practice guidance contained here are gathered from a wide range of sources and industries, including oil and gas, aviation, nuclear and space. The aim is that companies learn together and benefit from each other's experience.

Human factors in OCIMF

These principles describe OCIMF's approach to human factors. OCIMF uses the principles as a simple script to talk about human factors, and as a guide for the improvements we make in OCIMF activities.

The principles are:

- People will make mistakes.
- People's actions are rarely malicious and usually make sense to them at the time.
- Mistakes are typically due to conditions and systems that make work difficult.
- Understanding the conditions in which mistakes happen helps us prevent or correct them.
- People know the most about their work and are key to any solution.
- Plant, tools and activities can be designed to reduce mistakes and manage risk better.
- Leaders contribute in shaping conditions that influence what people do.
- It matters how leaders respond when things go wrong and that they take the opportunity to learn.

Human factors focus areas

OCIMF has defined five focus areas of tanker operations where human factors play the most significant role:

1. The role of leadership in defining the culture

Culture in this Guide refers to the shared ideas, attitudes and behaviour that people bring to their work. It covers how they communicate and work together, how they make decisions, and how they process the results. It can be summed up in the phrase “it’s the way we do things around here”.

The key factor that drives and shapes a culture is the leadership shown by management and officers. The sort of leadership actions that can have a positive influence on culture are:

- Actively promoting speaking up so that everyone feels empowered to highlight work issues and concerns.
- Respectfully listening to concerns from people at all levels, acting on them when appropriate, but also providing feedback when action isn’t needed.
- Encouraging everybody to feel empowered to intervene and resolve issues that might lead to unsafe work.
- Communicating and rewarding continuous improvement.
- Responding in a way that recognises and values learning when things go wrong, instead of reacting with blame.

2. Well-executed tasks and procedures

Tanker operations involve extensive management systems, risk assessments, procedures and guidance. Mostly, these are based on how we imagine the work should be done, or ‘work as imagined’. By contrast, ‘work as done’ is how the work actually happens on the day, on location, in the circumstances at the time. The difference between the two is referred to as ‘work as imagined versus work as done’.

However well a task might be planned, the workforce always designs aspects of it for themselves. For example, it could be where they carry out a job or how they deal with an unexpected difficulty. ‘Work as imagined’ and ‘work as done’ are rarely the same. Difficulties with tasks, unclear procedures, hard-to-use equipment, workload, lack of resources and low-quality or insufficient training give rise to improvised ways of working, and the mistakes that may eventually lead to incidents. So by understanding ‘work as done’ and tackling the underlying conditions and hard-to-use systems that can bring about human error, the likelihood of incidents can be reduced.

With this in mind, the human factors development plan should:

- Identify which tasks are safety critical.
- Work with personnel to understand how jobs are actually done and so identify any difficulties or error traps that may lead to mistakes or workarounds.
- Use a hierarchy-of-controls approach, looking from the perspective of those closest to the work, to eliminate or engineer out potential problems and error traps, and provide controls to prevent, detect and recover from mistakes.

3. Well-designed equipment and controls

Well-designed equipment and controls are intuitive to use and resistant to error. Again, the key is to work with the people who use the equipment. The human factors development plan should address questions such as:

- Has all safety-critical equipment been identified?
- Can all personnel, including those on their first work experience, operate it without error?
- Is the equipment reliable and simple to maintain?
- Is it in the proper place and easy to get at?
- Does it make allowances for human faculties and the ways people prefer to work?
- Is there new or alternative equipment that would be better?

4. Skills to respond to emerging situations

Regulations and guidelines set down the parameters for normal operations. But crews and onshore teams often have to deal with unexpected and changing situations caused by weather, sea-states, equipment and process changes, and other events. Their ability to adapt and respond well during such situations will give them a better chance of maintaining safe operations.

The human factors development plan should address questions such as:

- What skills are needed, for individuals and for teams, to identify and respond to unexpected and changing situations?
- Have we prepared our workforce to be able to recognise unexpected dangerous situations?
- How do we maintain skills over time, particularly those that are safety critical but very rarely used?
- Can we effectively gauge how different situations may affect whether a task can be done in the usual way, or how it might be adapted?
- Are staff trained to keep track of stress, concentration levels, fatigue and other factors that might impair their work and decision-making skills?

5. Learning before and after things go wrong

The company and its workforce should learn constantly, both from everyday work that is proceeding normally and from things that go wrong. This includes being aware when safety margins might be being pushed.

The human factors development plan should address questions such as:

- How thorough and accurate is the information collected on near-misses, incidents, and accidents?
- Are the resources and expertise available to investigate incidents properly?
- Do investigations look beyond human error and seek to make sense of the systems and conditions that allowed the incident to occur?
- Are processes in place that can spot potential failures before they cause an incident?
- Are personnel routinely involved in identifying potential risks and ways to make tasks safer?

Aim: To help companies and leadership teams recognise and control the conditions and systems that influence human actions and decisions, and so promote safety and excellence across all operations.

Key performance indicator summary

The OCIMF human factors approach considers both the focus areas outlined above and ways to build companies' capability to deal with them. The table below summarises the overall map of key performance indicators (KPIs) relating to human factors, grouped by the following categories:

- Policy – the role of leadership in promoting a human factors approach.
- Capability – how the company builds its capacity to implement the policy.
- Design and execution – ensuring the appropriate tools, processes and training are in place.
- Skills – are staff trained to identify and respond in emerging situations?
- Learning – both when things go well and from mistakes.

The subsequent tables give more detailed information and best practice guidance for each KPI.

	Level 1 KPIs	Level 2 KPIs	Level 3 KPIs	Level 4 KPIs
	<ul style="list-style-type: none"> • Leadership commitments • Framework to build capability • Purpose, policy, roles • Easier technical aspects 	<ul style="list-style-type: none"> • Beginning to implement plans • More complex technical aspects that would be helpful 	<ul style="list-style-type: none"> • Evaluating SMS • Measuring performance and improving • Increasingly systematic, reliable and sustainable 	<ul style="list-style-type: none"> • Self-sufficiency • Continuous improvement • Future proofing • Leading in industry
Policy: the role of leadership in promoting a human factors approach	14.1.1 The SMS contains a company policy on human factors along with a commitment that the company plans to implement this policy.	14.2.1 The human factors policy and the actions that flow from it are regularly communicated as central to the company's overall mission.	14.3.1 Rather than looking to blame, leaders commit to learn through feedback on systems, conditions and tasks.	14.4.1 Leaders examine how their intent and communications are received by shore-based and ship personnel, and review messaging and approach accordingly.
	14.1.2 The SMS defines how the company encourages open dialogue between ship crews and shore management.	14.2.2 The company gathers information from the frontline and provides structured feedback on systems, conditions and tasks.	14.3.2 The company regularly asks frontline personnel to review levels of satisfaction and trust in leadership among fleet staff.	14.4.2 The management reviews satisfaction and trust results from surveys to develop action plans and provide feedback, as needed.
Capability: how the company builds its capacity to implement the policy	14.1.3 People are appointed to be responsible for understanding and implementing human factor policy.	14.2.3 Human factor champions are visible, conveying information and seeking input to actions related to human factors.	14.3.3 Senior shore-based managers demonstrate their understanding of human factors and engage in implementing actions covered by the human factor policy.	14.4.3 The company builds an internal human factor capability and updates its human factor policy by advocating and participating in industry forums.

	Level 1 KPIs	Level 2 KPIs	Level 3 KPIs	Level 4 KPIs
Design and execution: ensuring the appropriate tools, processes and training are in place		14.2.4 The company provides personnel on ships with methods, tools and training to assess conditions that shape human performance in safety-critical tasks.	14.3.4 Designated onshore managers and ship management teams regularly review the performance of safety-critical tasks.	14.4.4 Safety-critical tasks are identified across the fleet and assessed against the potential for error and performance-shaping factors.
Skills: staff are trained to identify and respond in emerging situations		14.2.5 The company provides human factors training for personnel in safety-critical roles, so they are able to respond effectively in challenging situations.	14.3.5 The company uses scenario-based exercises to assesses the effectiveness of training for safety-critical activities.	14.4.5 The company verifies that training and exercises have given personnel the necessary skills to respond to emerging situations.
Learning: both when things go well and from mistakes	14.1.4 The SMS includes commitments to cultivate a non-blame culture and to learn how human factors contribute to incidents.	14.2.6 Investigation and learning processes incorporate training and tools that enhance incident investigators' understanding of human factors.	14.3.6 Investigations are carried out with the purpose of understanding the context of actions and decisions. They avoid attributing blame, and recommend improvements to equipment, tasks, organisation and skills that are helpful to users.	14.4.6 The company builds incident investigators' competence in human factors, and demonstrates the independence of investigators' recommendations from company management.

KPI level 1

	Key performance indicators	Best practice guidance
14.1	14.1.1 The SMS contains a company policy on human factors along with a commitment that the company plans to implement this policy (Policy)	<p>The human factor policy describes the components of the company's human factor approach.</p> <p>The company leadership commits to addressing human factors in its activities. The policy may include provisions to:</p> <ul style="list-style-type: none"> • Enhance understanding of human factors and how they are managed. • Recognise the link between human factors and safety performance. • Promote speaking up so that everyone feels empowered to highlight issues. • Respect and act on concerns of more junior team members. • Encourage everyone to feel they can act to resolve safety issues. • Promote, support and communicate continuous proactive improvement. <p>Senior management will probably be involved in the process of agreeing the core values that cover human factors. These discussions and consultations should be a valuable learning experience for a company.</p>
	14.1.2 The SMS defines how the company encourages open dialogue between ship crews and shore management (Policy)	<p>The leadership actively engages with the workforce at all levels, sharing values, expectations, information, listening and acting on feedback and concerns.</p> <p>The company commits to two-way engagement by:</p> <ul style="list-style-type: none"> • Gathering opinions and feedback from frontline personnel. • Discussing company and leadership values, expectations, and standards. • Encouraging personnel to speak up about concerns. • Leaders making themselves available to the workforce through walkabouts and discussions, with the aim of understanding what makes work difficult. <p>For more see ISGOTT.</p> <p>Two-way communication is essential at all levels of the organisation, and the senior management is uniquely positioned to positively influence the culture.</p>

	Key performance indicators	Best practice guidance
	14.1.3 Personnel are appointed to be responsible for understanding and implementing human factor policy (Capability)	<p>A key step is to build human factor issues into the training and development relevant to each person's position.</p> <p>The company appoints a senior manager who can act as the human factor champion. This person has the capacity and time to develop human factors and how it should be integrated into company activities.</p> <p>The human factor champion engages with wider leadership, explains human factor concepts, and aligns the company values and approach. They provide a resource that can learn and build capability in aspects of human factors relevant to the company.</p> <p>The leadership promotes the involvement of leaders, engineers, superintendents and management at all levels on board and ashore.</p>
	14.1.4 The SMS includes commitments to cultivate a non-blame culture and to learn how human factors contribute to incidents (Learning)	<p>A documented commitment includes the following (see ISGOTT):</p> <ul style="list-style-type: none"> • Leaders resist the temptation to blame individuals, and instead look for the systems and conditions that make mistakes more likely. • The company intends to investigate incidents from both a technical and human factor perspective. • Investigators are trained to recognise and understand human factors. • Investigations seek to look beyond immediate causes or human error. • Leaders promote a culture where the people involved in an incident feel that they can co-operate fully with an investigation.

KPI level 2

	Key performance indicators	Best practice guidance
14.2	14.2.1 The human factors policy and the actions that flow from it are regularly communicated as central to the company's overall mission (Policy)	<p>The company recognises the value of human factor skills as a critical part of a healthy safety culture. The company uses its human factors policy as part of its management discussions and communications. This includes:</p> <ul style="list-style-type: none"> • Evidence that the human factors policy is regularly referred to and used to influence company communications and actions. • Allocation of resources. • Human factor actions, timelines and review frequencies. • Prioritisation of human factor considerations. • Examining the effectiveness of the policy and its associated actions, communicating and engaging with personnel to get feedback. • Human factor issues are included in SMS revisions and integrated with onboard activities, e.g. risk assessments, toolbox talks, safety briefings and handovers. <p>Evidence of including human factor issues in management reports, board minutes, etc.</p>

Key performance indicators	Best practice guidance
14.2.2 The company gathers information from the frontline and provides structured feedback on systems, conditions and tasks (Policy)	Two-way communication is established, as committed to in level 1: <ul style="list-style-type: none"> • Surveys, appointment of safety reps, management visits. • Managers are visible and accessible. • Leadership commitments, views, statements. To achieve this, the company may use existing safety committee/crew/monthly meetings, introduce alternative structured feedback, such as 360s, or set up a separate forum as identified in the SMS.
14.2.3 Human factor champions are visible, conveying information and seeking input to actions related to human factors (Capability)	Well-designed plant, activities and processes can help to manage risks and reduce mistakes. People are involved in almost every aspect of operation, design and construction, maintenance and work control. Responsibility for these areas is normally divided between several company departments, so multi-disciplinary groups need to be involved in activities to improve human factors. <p>Human factor champions promote human factors via activities such as:</p> <ul style="list-style-type: none"> • Senior personnel communicating human factors as a priority. • Technical personnel gathering and assessing information, and proposing areas of focus or human factor-related solutions. • Developing or drawing on training/capability programme centred around human factors. • Considering a multi-discipline working group to support the human factor champion and start widening participation in human factor issues. • Shipboard management teams genuinely willing to listen, and promoting an open culture where people feel free to speak-up. • Input being sought from frontline personnel.
14.2.4 The company provides personnel on ships with methods, tools and training to assess conditions that shape human performance in safety-critical tasks. (Design and execution)	Where human decisions are the only barrier against a serious incident, it may be only a matter of time before there is an error. To make sense of the full potential for errors, misjudgements and workarounds in a systematic way, ships and terminals undertake activities to: <ul style="list-style-type: none"> • Understand what tasks, if performed incorrectly, could lead to a serious incident. • Understand where and how human action or inaction might make a failure more likely or more serious. • Design tasks to eliminate or minimise errors. • Increase the ability to detect or recover from situations. • Suggest changes to reduce the chance of error and improve conditions that make errors more likely. • Develop an open, learning culture where crews and employees feel safe to speak up, where the real causes of mistakes can be learnt, and where the company's values and process support this. See ISGOTT for advice on safety-critical tasks and critical task assessment.

	Key performance indicators	Best practice guidance
14.2.5	<p>The company provides human factors training for personnel in safety-critical roles, so they are able to respond effectively in challenging situations</p> <p>(Skills)</p>	<p>The company:</p> <ul style="list-style-type: none"> • Identifies human factors training that meets its own needs as well as those for Standards of Training, Certification and Watchkeeping. • Identifies and includes shore and onboard personnel for human factors training, and especially for those in safety-critical roles. • Monitors human factors training to ensure it covers the range of activities undertaken. It also monitors the quality of training. <p>Human factors training covers a range of topics, such as:</p> <ul style="list-style-type: none"> • The role of good leadership and resource management and how they can prevent incidents. • How to allocate resources (personnel, equipment, information, etc) effectively and efficiently. • How to remain aware of situations as they develop. • Ways to communicate quickly and clearly. • How to minimise the risk of human errors. • Why interpersonal relations are important. • How to manage conflicts. • How personnel can assert themselves in the right way. • How to be aware of cultural differences and bias. • Different leadership styles. • How teams are built, and the role of team dynamics. • Where each role fits in with the rest of the team. • How to manage and prioritise workloads. • Dealing with stress, tiredness and distractions. • Carrying out relevant drills. • How to manage people during a crisis.
14.2.6	<p>Investigation and learning processes incorporate training and tools that enhance investigators' understanding of human factors</p> <p>(Learning)</p>	<p>The company takes human factors into account when doing investigations. The learning that comes out of this may include:</p> <ul style="list-style-type: none"> • A deeper level of inquiry beyond immediate causes to underlying causes and contributing factors. • The selection of investigators with necessary skills, and the development of investigator capability. • Adapting tools or techniques to understand human factors. • Incident analysis. • Acting on investigation results. • Changes to equipment/tasks. • Using case studies/education/training. • Using results to influence actions related to human factors. • Managers respond in a way that encourages learning, rather than seeking to blame personnel when things go wrong. • The human factor capability of incident investigators is developed.

KPI Level 3

	Key performance indicators	Best practice guidance
14.3	14.3.1 Rather than looking to blame, leaders commit to learn through feedback on systems, conditions and tasks (Policy)	<p>The idea of blame is rejected in favour of an openness to learn and a collective responsibility. This approach includes:</p> <ul style="list-style-type: none"> • Leadership discussions and messages that support human factors. • Investigation findings and inspection observations that are treated as an opportunity to learn. • Leaders reflecting on their own roles and examining their own responsibilities. • Inspection response targets that enhance conditions and systems to support people carrying out various activities.
	14.3.2 The company regularly asks frontline personnel to review levels of satisfaction and trust in leadership among fleet staff (Policy)	<p>The company regularly engages with the workforce and may arrange for the election or nomination of human factor representatives on a ship or at a facility.</p> <p>The human factor representatives act as a liaison between crews and leadership ashore. Their regular activities may include:</p> <ul style="list-style-type: none"> • Regular on-board meetings to discuss human factors that contribute to safer working environments. • Engaging regularly with onshore management. • Providing feedback on areas for improvement. <p>Representatives may also work together as a community to champion or support fleet-wide initiatives to improve human factor issues.</p>
	14.3.3 Senior shore-based managers demonstrate their understanding of human factors and engage in implementing actions covered by the human factor policy (Capability)	<p>Any attempt to improve human factors must be multi-discipline by nature. An effective policy, and associated actions, will be proved in practice by increased awareness, involvement and progress across the operation.</p> <ul style="list-style-type: none"> • Senior shore managers demonstrate their commitment to human factors: <ul style="list-style-type: none"> – Directors/general managers. – Fleet managers. – Superintendents/ship managers. • Managers from across departments support and engage with the human factors policy. • Measurable progress is made on the human factor issues and actions identified in the policy. • Frontline personnel have an enhanced understanding of human factors. • Human factor performance is regularly reviewed against the policy.

	Key performance indicators	Best practice guidance
14.3.4	Designated onshore managers and ship management teams regularly review the performance of safety-critical tasks (Design and execution)	<p>The company SMS emphasises walk-throughs and talk-throughs of tasks, looking for such things as:</p> <ul style="list-style-type: none"> • Difficult aspects of the task. • Areas susceptible to error. • Factors that increase the likelihood of error. <p>Following the review, recommendations are made to take action to reduce errors or tackle factors that make errors more likely (see ISGOTT).</p>
14.3.5	The company uses scenario-based exercises to assess the effectiveness of training for safety-critical activities (Skills)	<p>The company develops human factor skills via a combination of training, practice and regular rehearsing, both for individuals and for teams (see ISGOTT).</p> <p>Training areas include:</p> <ul style="list-style-type: none"> • How stress affects the way people make decisions, and how stress can be managed. This also covers support systems, communication and decision aids. • The importance of team composition, teamwork, team goals, clarity of expectations and communication. • How team members can keep an eye on others' work and physical/mental condition, and recognise the signs that they need to step in. • How senior team members can remain open to suggestions and challenges from junior team members. • Personnel understand the best time and right way to speak up about decisions or actions that might lead to an incident. • How to resolve conflicts quickly. <p>Repetition alone is not enough to develop expertise. Deliberate practice is required. This means:</p> <ul style="list-style-type: none"> • Learners should be motivated and willing to push themselves. • Clear, specific, realistic goals should be set. • Learners should be challenged to stretch their existing abilities. • There should be regular, high-intensity practice sessions with enough time in between for learners to recover and absorb what they have learned. • Instructors should give feedback on goals achieved and work still to be done.

	Key performance indicators	Best practice guidance
14.3.6	<p>Investigations are carried out with the purpose of understanding the context of actions and decisions. They avoid attributing blame, and recommend improvements to equipment, tasks, organisation and skills that are helpful to users</p> <p>(Learning)</p>	<p>The company uses investigations to identify the systems and conditions that make errors more likely.</p> <ul style="list-style-type: none"> • Leaders commit to using investigations for learning and improving rather than blaming. • Investigation findings go beyond human error, and recommend changes to systems, equipment, task design, and address leadership and organisation issues. • The company separates investigation processes from discipline or accountability processes. • The company uses classification of incidents that go past individual actions and instead identify precursors to systemic and condition-based errors. • The company uses data to show the proportion of incidents caused by systems and conditions.

KPI Level 4

	Key performance indicators	Best practice guidance
14.4	<p>14.4.1 Leaders examine how their intent and communications are received by shore-based and ship personnel, and review messaging and approach accordingly</p> <p>(Policy)</p>	<p>Onshore management communicate a consistent message about their commitment to human factors, and examine how these messages are received and put into action.</p> <p>Leaders are open to feedback from frontline personnel, actively look for the evidence they need, and adapt as necessary.</p> <p>Information from site visits, personal interviews and engaging with workforce representatives and audiences, personally and virtually, can all provide feedback on how personnel interpret leaders' messages. Leaders take action to provide more context, guidance or opportunities to help people to understand the message.</p>
	<p>14.4.2 The management reviews satisfaction and trust results from surveys to develop action plans and provide feedback, as needed</p> <p>(Policy)</p>	<p>Evidence shows that high levels of satisfaction and trust between managers and workforce lead to better process and personal safety performance.</p> <p>The company uses surveys designed to capture the views of staff. These include:</p> <ul style="list-style-type: none"> • Frontline personnel's input to management onboard and onshore. • The opportunity for personnel to comment on their own line manager and relationship with the company. • A measure of the level of trust among staff in their line managers and the company. • Whether personnel have a sense of belonging, feel they are treated fairly and are able to provide constructive feedback. • Do frontline personnel fear being blamed or facing disciplinary measures? • Questions about fair remuneration and work/life balance. • Questions about fatigue and wellbeing.

	Key performance indicators	Best practice guidance
14.4.3	<p>The company builds an internal human factor capability, and updates its human factor policy by advocating and participating in industry forums</p> <p>(Capability)</p>	<p>The company builds its professional capability in several ways:</p> <ul style="list-style-type: none"> • Sponsors staff to take part in a human factors learning pathway or accreditation scheme. • Appoints qualified people into human factor roles or into a wider team. <p>Improvements to issues related to human factors are reviewed and updated in the light of systemic learnings that go beyond technical causes. Sources include:</p> <ul style="list-style-type: none"> • Inspections. • Incidents. • Critical task analysis. • Industry events and best practices. • Risk profiles/process safety techniques (Hazid/Hazop, etc). <p>Leading and taking part in industry efforts on human factors are an important aspect of building capability. The company participates in industry forums such as:</p> <ul style="list-style-type: none"> • Representation/advocacy/contributing to industry workgroups on human factors. • The next iteration of industry-wide systems/regulations/training for human factors.
14.4.4	<p>Safety-critical tasks are identified across the fleet and assessed against the potential for error and performance-shaping factors</p> <p>(Design and execution)</p>	<p>The company makes fleet-wide changes to design equipment, systems and controls with an aim to detect, reduce and recover from errors. This includes:</p> <ul style="list-style-type: none"> • Determining which tasks are safety critical. • Using tools to understand potential errors and performance-shaping factors that make incidents more likely. • Identifying layers of protection for these safety-critical tasks to either eliminate tasks completely or reduce errors and increase the likelihood of detection and recovery. • Ensuring that learning related to tasks/design factors is communicated to company management across the fleet. • Proactively identifying new developments in processes, systems and technology and understanding their impact, including any unintended consequences. <p>The company uses barrier analysis methodologies to:</p> <ul style="list-style-type: none"> • Identify which barriers are critical. • Understand the expectations of people in those barriers. • Assess how realistic those expectations are.

	Key performance indicators	Best practice guidance
14.4.5	<p>The company verifies that training and exercises have given personnel the necessary skills to respond to emerging situations</p> <p>(Skills)</p>	<p>The day-to-day demands of operations could mean that skills are not practised despite sound training and exercises, and teams' best intentions to apply them.</p> <p>The company and ship management actively examine the effectiveness of training by using a combination of role-modelling, encouraging personnel to speak-up and by enhancing non-technical skills and crew resource management.</p> <p>The company recognises personnel who champion speaking-up and challenge the status quo.</p> <p>The company verifies the effectiveness of Standards of Training, Certification and Watchkeeping/crew resource management training during operations, using methods such as:</p> <ul style="list-style-type: none"> • Observing actual operations. • Coaching feedback on technical and non-technical skills. • Using remote monitoring (e.g. VDR). • Visiting or riding ships as part of competence assessments.
14.4.6	<p>The company builds incident investigators' competence in human factors, and demonstrates the independence of investigators' recommendations from company management</p> <p>(Learning)</p>	<p>The company builds the professionalism and independence of investigators by implementing measures that include:</p> <ul style="list-style-type: none"> • Providing professional incident investigator training and upgrading the skills of human factor champions to expert level. • Demonstrating blame does not exist in any part of the incident response or investigation process. • Demonstrating the independence of incident investigators from senior management influence.



Our vision

A global marine industry that causes no harm to people or the environment

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