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**Maritime Sustainability and
the Human Element -
Promoting the Safety Culture Onboard**



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INTRODUCTION

Human Element and Accident



- IMO's 2013 Sustainable Maritime Transportation Concept.
- System must promote a safety culture through global standards and rigorous enforcement.
- “Level playing field”.
- Safety culture should go beyond mere regulatory compliance.
- Deliver added value for the System through the promotion of safety.

INTRODUCTION₂

Maritime Sustainability and Safety Culture

- Corporate Social Responsibility (CSR) activities.
- Safety culture campaigns and activities, including the "Zero Accident" campaign.
- Human element issue cannot be overemphasized as 80 to 85% of all shipping accidents involved human error
- Capsizing of the *Herald of the Free Enterprise*
- ISM Code



INTRODUCTION₃

This Paper



- Examines the human element in relation to maritime safety, and how the ISM Code as well as the other tools can help to promote a Safety Culture onboard.
- Issues Related to Human Error.
- ISM Code.
- Safety Observations and Interventions.
- Conclusions and Recommendations.

ISSUES RELATED TO HUMAN ERROR

Design Issues

Design and Layout

- Workplace design may increase the likelihood of human error if ergonomics are not considered.



Design and Habitability

- Appropriate design of living spaces assist in recovery from fatigue.

ISSUES RELATED TO HUMAN ERROR₂

Personnel Issues

Fatigue

- Degrades performance at all levels which can lead to accidents.
- Exxon Valdez.



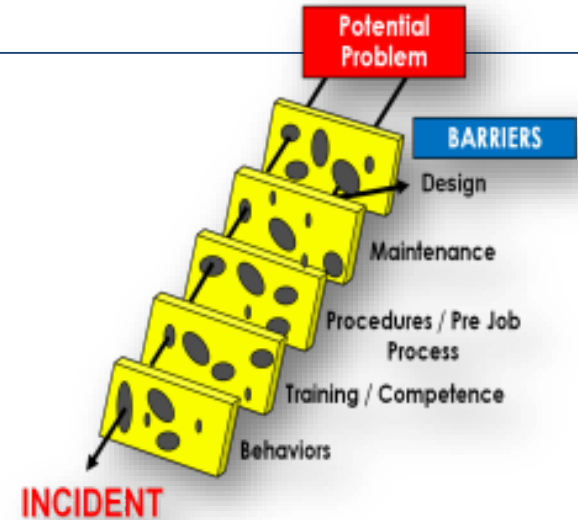
Situational Awareness

- Do you know what's REALLY happening?
- 71% of all human error types.
- Cuyahoga.

ISSUES RELATED TO HUMAN ERROR₃

Organizational and Management Issues

- Immediate Causes
- Underlying causes / latent failure
- “Swiss Cheese”



Bridge Resource Management

- Originates from airline industry's Cockpit Resource Management.
- Training in leadership, communication, teamwork, assertiveness, situation awareness, and workload management.

Safety Culture

- If management pays “lip service”, or even “accepts” unsafe behaviour, then similar culture adopted onboard.
- efficiency-thoroughness trade-off (ETTO) – goes back all the way to Titanic.

ISM CODE

Safety and Environmental-Protection Policy



Section 2 of ISM Code

- Contents of the policy should not be too generic.
- May include a Vision Statement on Safety, Core Values in Safety as well as Golden Rules.
- Signed off by the very top executive of the organization, showing the leadership's commitment to safety.
- Important for top management to “walk the talk” and lead by example.

ISM CODE₂

Designated Person Ashore (DPA)



Section 4 of ISM Code

- To provide a link to those on board through a DPA who has direct access to the highest level of management.
- Link is expected to result in a two-way communication between the ship and up to the most senior executive in the company.
- Sends a strong message to the crew that the leadership from the very top is committed to safety.



Section 5 of ISM Code

- Motivating the crew in the observation of that policy.
- Periodically reviewing the safety management system (SMS) and reporting the deficiencies to management.
- Overriding authority and responsibility to make decisions with respect to safety.
- Sense of ownership and empowerment of the Master and the crew.



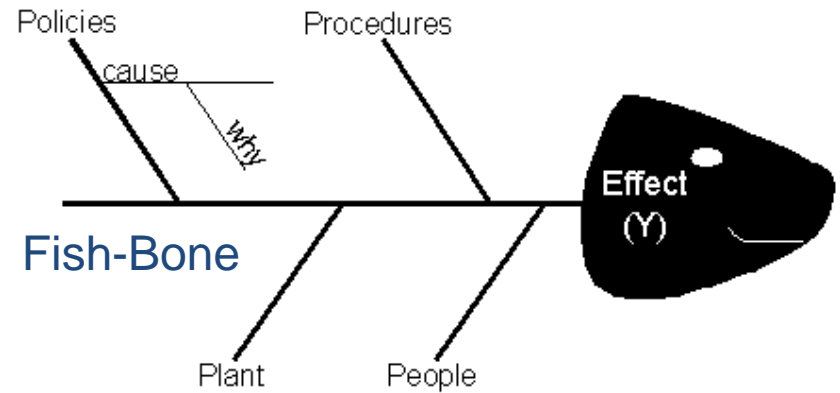
Section 9 of ISM Code

- Non-conformities.
- Accidents.
- Hazardous Occurrences (Near-misses).
- Analysis of Immediate Causes and Underlying (Root) Causes.

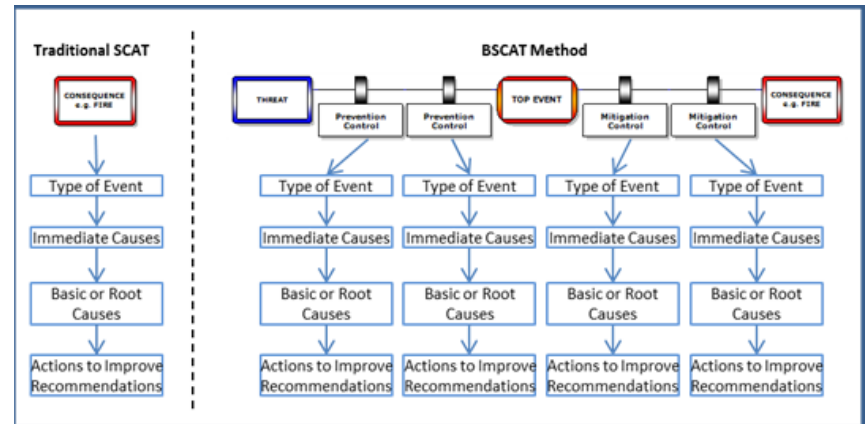
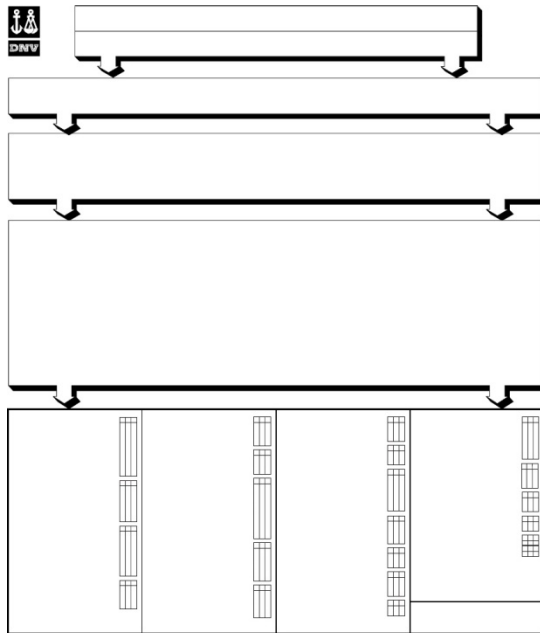
ISM CODE₅

Root-Cause Analysis Tools

5 Whys



DNV's Marine Systematic Cause Analysis Technique (MSCAT)



Barrier-based SCAT (BSCAT)

ISM CODE₆

Other Elements

- Assessing all risks to its ships, personnel and the environment and establishing appropriate safeguards (Section 1.2.2).
- Training and familiarization of crew in their duties related to safety and protection of the environment (Section 6).
- Emergency Preparedness (Section 8).
- Proactive approach to safety by carrying out inspections and maintenance of the ship and its equipment (Section 10).

ISM CODE₇

Effectiveness of ISM Code

- Too much paperwork and just a paper work exercise?
- Contributed positively to maritime safety and reduction of accidents.
- Lack of reporting of non-conformities, accidents and hazardous occurrences, especially near-misses.
- Missed out on the analysis of the root cause(s) of accidents or near misses.
- How to encourage reporting of near-misses?

SAFETY OBSERVATION AND INTERVENTION

- Not new as DuPont's Safety Training Observation Program (STOP) is a Behaviour Based Safety (BBS) program that has been used in many industries for more than 30 years.
- Relies on observation and intervention techniques and proactive reporting of unsafe acts and conditions.
- One of the key principles of BBS is “no name, no blame”.
- Recognition of safe behaviour and concern for at-risk behaviours.

Conclusions and Recommendations



- An estimated 80 to 85% of all shipping accidents involved human errors.
- Issues related to human errors include both direct/immediate as well as indirect/latent failures.
- Cause of failure related to situation awareness is the main direct factor in accidents. Fatigue is also a contributory factor to accidents.
- Failures related to Resource Management include lack of training in leadership, communication and motivation.
- Safety culture has positive impact while a poor attitude by management towards safety would result in a similar attitude adopted by the crew.

Conclusions and Recommendations₂



- Positive contribution of ISM Code towards safety with the reduction of accidents but lack of reporting of non-conformities, accidents and near-misses is a problem.
- Safety observation and intervention program can help to tackle the problem of under-reporting of near-misses
- Investigators should also learn to dig deeper to uncover latent failures.
- Pay attention not only to the hours of rest but also the quality of rest to improve performance and reduce risks.
- training to be carried out by reputable providers.
- Ship visits by management to show commitment to safety.
- Reward for reporting and participating in safety program

Thank you for your time.