



The International Maritime Human Element Bulletin

Issue No. 16 January 2008

ISSN 1747-5015

Alert!



Rogue behaviour is not the hallmark of a professional mariner

Some time ago, the United Kingdom's Chief Inspector of Accidents reported that one of his greatest concerns for safety in merchant vessels was *complacency*. This caused some people to suggest that his statement was an affront to the professional mariner, while others conceded that it was a serious issue that had yet to be addressed.

Complacency is but one of a number of character traits that can bring about a culture of non-compliance, lapses of judgment and unprofessional behaviour. In the book **Darker Shades of Blue - The Rogue Pilot**, the author introduces us to the term *Rogue Behaviour*, which he defines as *willingly and unnecessarily failing to comply with existing guidance or taking unwarranted risks*.

Rogue behaviour can manifest itself in a variety of ways. Some rogue behaviour inducing conditions are readily recognisable: boredom, complacency, drudgery, familiarity, ignorance, impulsiveness, risk taking and routinisation.

Others may not be so easy to recognise: apathy, assumptions, compliance, contentment, contempt, dumbing-down, invulnerability, perceptions, predictability and seclusion - all of these are explored further in the centrespread feature of this bulletin (see page 4).

There is no 'catch-all' solution to the problem of rogue behaviour. Each of these character traits can be avoided through good management, by:

- providing a safe, secure and usable working environment, decent working and living conditions and fair terms of employment;
- encouraging a healthy lifestyle;
- establishing an appropriate balance between the job and the people

required to operate a ship safely and effectively;

- ensuring consistency in standards of education and training, through task/system specific training, taking into account the job, the operational role and operating pattern of the ship, and the environment in which it is likely to work;
- conducting regular onboard continuation training, including tabletop exercises on lessons learned from accident investigation reports;
- providing crew resource management, leadership and assertiveness training;
- providing clear and concise operating instructions and technical and maintenance manuals;
- empowering the master and chief engineer as an extension of the shore management team,
- investing in the seafarer through the development of a 'company culture' based on transparency, participation, personal development and family involvement;
- motivating the seafarer towards a culture of compliance and professional pride.

Whether you call it *Complacency* or *Rogue Behaviour*, neither is the hallmark of a professional mariner...

Darker Shades of Blue - The Rogue Pilot, published by McGraw-Hill, ISBN 0-07-034927-4

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Alert!

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2 Explaining complacency and routinisation

Wayne Perkins, Human factors Analyst, Maritime New Zealand

Complacency and routinisation are widespread in the maritime industry, and this is, by and large, inevitable when mariners repeat their voyages time after time. When these conditions exist accidents can occur, as an unfortunate by-product of routine and efficient operation - perhaps a provocative statement, but one that recognises that the trade off between safety and production is never easy. With the maritime industry moving to lower manning levels, obvious deficiencies (in some operations) in the manning of navigational watches are now becoming apparent.

'Complacency' and 'routinisation' are labels that describe a number of behaviour patterns in a variety of situations. For example: Why don't some mariners look out of the window? To look out of the window or to do something else is a choice - a choice that is made both consciously and non-consciously. Psychologists studying the two-choice situation have found that the time and effort put into the

available options is proportional to the reward available in each option.

These studies look at choices made over time, so they explain how people act over time - as opposed to any one occasion. Looking out of the window has at least two sources of reward: 'action' on the seas and feedback from others for keeping an effective lookout. As these lessen and the bridge environment becomes more interesting, looking out of the window will weaken.

In his 1990 book, Jim Reason described a study by Habberley and his colleagues at the Warsash Maritime Academy where experienced ships' officers (in a simulator) consistently sailed their ships within close range of other vessels before taking avoiding action. Action was taken when the range was small "for no apparent reason, and without any sense on the subject's part that this was an error".

Officers had developed excellent close avoidance manoeuvring skills, honed

through near misses that gave them confidence in their own abilities. The real world day-to-day experiences came to take precedence over prior training. These experiences are based on how people avoid danger.

Experimental studies show a strong bias to take avoiding action late in the chain of events, rather than early. This seems to be a hard-wired approach to danger. It is only with considerable experience - including near misses and accidents, that avoidance action is taken earlier in the chain of events.

Underpinning many accidents are fatigue and a 'lack of arousal', in that the mariner was operating on 'auto pilot'. If a well visited situation is very predictable (particularly when little occurs within it), then proactive safety behaviours, such as searching or responding to developing situations will weaken, as they are not effectively rewarded.

In extreme situations this can lead to the mariner 'turning off'.

What's new... IMO MSC 83

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Published by the Nautical Institute, the world's leading international professional body for qualified mariners

www.nautinst.org

Membership info: sec@nautinst.org

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Design & artwork production by:
Jacamar (UK) Ltd +44 (0)23 92410108

Printing by: Indigo Press +44 (0)23 8023 1196

Web site by & cartoons by: NewsLink Services
(India Office) +91-9811649064

The 83rd meeting of the IMO Maritime Safety Committee has approved the following Circulars:

- MSC-MEPC.7/Circ.5: *Guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies* www.imo.org/blast/blastData.asp?doc_id=8618&filename=5.pdf
- MSC-MEPC.7/Circ.6: *Guidance on the qualification, training and experience necessary for undertaking the role of designated person under the provisions of the International Safety Management (ISM) Code* www.imo.org/blast/blastData.asp?doc_id=8619&filename=6.pdf
- MSC.1/Circ.1253: *Shipboard technical operating and maintenance manuals* www.imo.org/blast/blastData.asp?doc_id=8661&filename=1253.pdf

The Committee also agreed to include in the work programme of the Sub-Committee on Ship Design and Equipment (DE), a high priority item on 'Protection against noise on board ships'.

Web-based Maritime English Learning Tool

A new web-based maritime English learning tool designed to promote the maritime English language competences of those working in the various maritime professions in Europe is available from: www.utu.fi/en/units/cms/activities/education/learningmaterial/marengplus/Pages/home.aspx

SafeWork Bookshelf

The SafeWork Bookshelf is a collection of key Occupational Safety and Health documents produced, in whole or in part, by the ILO. It is available on the Internet and on CDs, in both English and French. www.iloencyclopaedia.org/

Fatigue Management

Maritime New Zealand has developed a range of resources to help seafarers, vessel owners and managers in the maritime industry better understand and manage fatigue, to prevent fatigue-related accidents. Included is essential information about the causes and consequences of fatigue; guidance on specific fatigue management strategies that could be used in a fatigue management plan; and guidance on writing a fatigue management plan. http://www.maritimenz.govt.nz/Fatigue/fatigue_management.asp



Stephen Meyer
Chief Inspector of Marine Accidents
UK Marine Accident Investigation Branch (MAIB)

Complacency at work

Until recently, accident investigators identified causal factors in many accidents as being such things as: 'failure to maintain a proper watch'; 'unsafe speed in reduced visibility'; 'poor maintenance'; 'no dedicated lookout'; 'standing in a dangerous position during berthing operations'; 'poor bridge teamwork'; and many more such factors. However, by now analysing all of these factors more deeply, we are able to identify complacency as being at the root of many of them.

The word 'complacency' has negative connotations, but it is not intended to be derogatory when used in this context; we are referring to the natural human response to a very familiar situation. When we do something for the first time, we are intent on what we are doing and we are painfully aware of the hazards; by the time we have done it without incident a thousand times, we have lost that stimulation; we have become confident that nothing will go wrong; and our guard is lowered. So complacency is not a criticism, but is an aspect of human nature – one that every experienced mariner will recognize.

How does this manifest itself at sea? As mariners, we work in an unforgiving environment. Things do go wrong; people do make mistakes; equipment does fail. But these should be allowed for by having safety barriers in place, so that one or even more failures do not result in a catastrophe.

Extra personnel on the bridge for harbour entry; planned maintenance; testing controls after moving conning positions; isolating equipment before maintenance; lookouts; using a check-off list; testing confined spaces before entry; using waypoint alarms; these are some examples of safety barriers that should be in place, but which often lapse through complacency. People subconsciously think that, because they have not needed these safety barriers in the past, they will not need them in the future. This is complacency at work.

Complacency must be addressed at every level:

- Professional pride and standards have an important part to play – professional

bodies need to tackle this;

- Training colleges need to address complacency in their courses;
- Some masters and chief engineers nowadays feel disenfranchised – they must take responsibility for the setting and maintenance of standards onboard their ships;

And finally

- Companies must recognise this is a fundamental safety issue that they have to address.

These are only initial thoughts on how to tackle this major problem; it is up to each area to recognise the problem and consider how best to address it. In the UK, MAIB has asked the Chamber of Shipping to set up a working group with owners, managers, professional institutes, unions and training colleges to consider the subject.

I would urge everyone in the industry worldwide to think about complacency, and to implement measures to overcome it. This would be a significant step towards eradicating unnecessary accidents at sea.



Captain Fusao Abe
Marine Accident -
Inquiry Agency
Japan

Mitigating human error by improving communication

From a physiological point of view, the human being does not have enough ability to process an enormous amount of information received through the senses, and consequently his thought process devises some way of processing it as follows:

- To narrow information to input;
- To retain unprocessed information temporarily when a thought process is busy and to process it after making room for it;
- To make a short circuit connecting input directly to output

As a result, a thought process does not process appropriately some information from the outside world but instead throws it away or distorts it; accordingly this can contribute to human error, such as routinization, easy or careless operation, or skipping procedures.

The following is an example:

A barge, being towed by a tug boat manned by three crew members including the Master, was ascending the river in good daytime visibility. After passing under the last bridge toward their destination, the crew raised the boom of the crane, neglecting to confirm whether there were any overhead obstructions ahead. The boom of the crane struck overhead power lines, the height of which was about 30 meters above water level. As a result of this accident, a power failure occurred over a wide range in the metropolitan area for several hours.

The assigned cause of the accident was poor lookout on the preconception that there were no power lines and the experience of the master, who had sailed up and down the river many times without any accidents.

Our analysis showed that even though the fine power lines in the distance were within eyesight and the retina will have been stimulated, it is extremely difficult to recognize it as an obstacle, and take

preventing action accordingly, when lacking a sense of risk assessment learned from lessons of past accidents, that is: the precaution against overhead obstacles.

The barge and the tug boat were free from other ships and were not affected by weather conditions. This situation got experienced persons into complacency such that they could not process information appropriately. This is a typical example of human error.

Bridge Resource Management training for mariners, using a simulator, has spread all over the world. It is an effective means of preventing marine accidents caused by human error. The purpose of the training is to break the error-chain sequence by improving communication and sharing information - which could have prevented the above-mentioned accident.

However, it is doubtful whether adequate precautions against human error are adopted in the so called 'domestic maritime industry' and therefore some concrete measures should be taken.

Exploring **rogue behaviour**

Apathy

Lack of interest or concern

'I don't care'

Solution:

- Check for illness, fatigue, incorrect nutrition, lack of physical fitness
- Investigate personal circumstances, in particular worries about family or job
- Develop a 'company culture' to encourage communication and empowerment
- Provide the seafarer with a safe and secure working environment, decent working and living conditions, fair terms of employment and a healthy lifestyle

Contentment

Feeling or showing satisfaction with one's situation

'I am happy with the situation'

Solution:

- Be sure that you know right from wrong
- Ensure that everyone has the same perception of the risks ('he who can keep his head when all around are losing theirs simply does not understand the facts of the situation')

Invulnerability

Impervious to danger or risk

'It won't happen to me'

Solution:

- Conduct regular table top exercises on lessons learned from accident investigation reports
- Do not reward this sort of 'hero'
- Make it hurt even if they get away with it
- Monitor young/bold staff

Assumptions

Facts, orders or statements that are taken for granted

'I thought that was what you said'

Solution:

- Do not be afraid to seek clarification of what is said
- Do not act on scant information

Drudgery

Dull, irksome, fatiguing, uninspiring or menial work

'Why do I have to do this?'

Solution:

- Rotas/sharing/teaming-up
- Ensure systems/equipment are best for the job
- Set safe performance targets to give a secondary meaning to achievement
- Introduce rewards/preference

Perception

To regard something as being the case

'That is my interpretation of the situation – I do not agree with yours'

Solution:

- Adopt a policy of 'strong opinions weakly held'
- Consider the power-distance (is admitting being wrong clouding judgement?)
- Encourage comment on the performance of a colleague or superior
- Always look for six explanations for a situation
- Consider the downside of getting it wrong (assess the risks)
- Consider the probabilities
- Check the facts on which a view is based

Boredom

The state of being weary and restless though lack of interest

'What shall I do to pass the time away?'

Solution:

- Redistribute work more evenly
- Ring the changes on responsibilities
- Promotion/changes in responsibility
- Encourage team work and interaction

Dumbing down

Simplifying to the point of meaninglessness

'If you treat me like an idiot, I'll behave like an idiot'

Solution:

- Do not dumb down to beyond the point of meaninglessness
- Find out what level of instruction/control crew are happy with and design the work and instructions to that level
- Collect feedback, especially after the introduction of new procedures
- Understand the capabilities and motivation of your crew

Predictability

To foretell on the basis of observation or experience

'I know what will happen next'

Solution:

- Always look for six explanations for a situation
- Consider the downside of getting it wrong (assess the risks)
- Consider the probabilities
- Check the facts on which a view is based
- Conduct 'what-if?' analysis

Complacency

Self-satisfaction especially when accompanied by unawareness of actual dangers or deficiencies

'I can't be bothered'

Solution:

- Do not take unnecessary risks
- Ensure compliance with appropriate regulations and follow proper procedure
- Conduct regular table top exercises on lessons learned from accident investigation reports
- Leadership and assertiveness training
- Crew Resource Management training

Familiarity

Too close an acquaintance with a procedure

'I know it all'

Solution:

- Regularly review and test procedures
- Conduct regular onboard continuation and refresher training
- Make it OK to observe on the performance of a colleague or superior

Risk taking

Taking an action where the outcome is uncertain, often in contravention of norms, regulations or procedures

'I'll take a chance'

Solution:

- Do not take unnecessary risks
- Ensure compliance with regulations
- Follow proper procedure
- Learn from the mistakes of others
- Conduct regular table top exercises on lessons learned from accident investigation reports

Compliance

A disposition to yield to others

'You know best'

Solution:

- Do not be afraid to challenge the decisions of others
- Leadership and assertiveness training

Ignorance

Lack of knowledge, education or awareness

'I don't know'

Solution:

- Consistency in standards of education and training
- Task/system specific training, taking into account the job, the operational role and operating pattern of the ship, and the environment in which it is likely to work
- Clear and concise technical operating and maintenance manuals
- Make it OK to observe on the performance of a colleague or superior
- Make it OK for anyone to ask for a check/critique

Routinisation

The effects of habitual or mechanical performance of an established procedure

'I've done it so many times before'

Solution:

- Regularly review and test procedures
- Conduct regular onboard continuation and refresher training
- Crew Resource Management training

Contempt

The taking of unnecessary risks, with scant regard for regulations and guidelines

'It won't happen to me'

Solution:

- Do not take unnecessary risks
- Ensure compliance with regulations and follow proper procedure
- Conduct regular table top exercises on lessons learned from accident investigation reports
- Leadership and assertiveness training
- Crew Resource Management training

Impulsiveness

Inclined to act on impulse rather than thought

'I know what I am doing'

Solution:

- 'Take five' to assess the risks before doing anything new or after an unexpected occurrence
- Conduct near miss and incident reporting analysis
- Encourage comment on the performance of a colleague or superior
- Consign the 'gung ho'/'macho' seafarer to history

Seclusion

Shutting away or keeping apart from others

'Leave me alone'

Solution:

- Seek support from peers
- Seek guidance from the more experienced
- Leadership and assertiveness training
- Crew Resource Management training



Captain ESR McAllister FNI
Shipmaster

Routine should spring from the core - not the checklist

"A man's work is in danger of deteriorating when he thinks he has found the one best formula for doing it. If he thinks that, he is likely to feel that all he needs is merely to go on repeating himself...so long as a person is searching for better ways of doing his work, he is fairly safe."

(Eugene O'Neill, playwright)

The Oxford English Dictionary defines 'complacent' as 'smug and uncritically satisfied with oneself or one's achievements'. Mao Zedong said simply: *Complacency is the enemy of study.*

Taking these as themes, I am convinced that the advent of the Safety Management Systems engendered by the ISM Code have been, in part, responsible for the 'dumbing down' of our industry – a slavish devotion to the 'checklist' and an unfortunate 'tick it' mentality giving rise to a situation quite contrary to the intent of the IMO.

The fundamental problem we face is how to generate a Safety Culture and mindset of *professionalism* through empowerment

of navigating and engineer officers.

Manuals, checklists and reports have a place, but it is in human values, attitudes, mindset, perceptions, competencies and patterns of behaviour that we need to exert most influence to enhance safety culture.

The airline industry may provide some cues:

- Increase the use of simulators to constantly challenge and test ongoing professional skills.
- 'Revolve' shipboard tasks so that all members of the team are exposed to different aspects of the jobs they perform. Increase the role of **active** cross-checking (versus countersigning the checklist!).
- Be prepared to move away from the old-fashioned 4-on/8-off watch routine to one of carefully assessing human bio-rhythms and in particular doing careful planning into a balanced hours of work AND rest routine.
- Develop the notion of 'Pilot flying/pilot not flying' especially between Master

and Chief Officer for port arrival and departure.

- Develop strict guidelines and practices to clarify and improve the relationships and tasks shared and executed between Bridge Team Management and the Pilot.
- Apply careful criteria and desired outcomes to the period of handover between officers and assure the process by exerting active third-party integrity checking.
- Assess in-port activities. Banish unnecessary work routines that help create fatigue.

Over-reliance on technology appears to me to be a root failure. Maybe it is possible to have 'technology-free days' so that a return to basic skills can remind officers to believe in themselves?

In many ways the SMS has become the lowest common denominator in terms of the human element onboard. A return to professionalism is long overdue. Routine should spring from the core - not the checklist.

Decentralised management as a safeguard against complacency



Captain Toni Bielić
University of Split
Faculty of Maritime Studies
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The influence of complacency can be efficiently avoided by reorganising functionally organised companies so as to obtain a matrix organisational structure. The matrix organisational structure has been developed due to the size of the fleet and technological variety of ships as well as to reduce and have better control of costs.

The basic difference lies in decentralised management that has led to stronger motivation and initiative on the parts of the master, chief engineer and officers on board. The reason is that in decision-making they take into consideration both the demands and measures of the ship and the sections on shore, ie: the ship's demands become equal to the demands of the office ashore, and this is the essence of returning authority back on board.

Decentralised decision-making has led to the need to form fleet management and establish the function of a project manager. Within each fleet there is appointed a project manager as a representative of the Company's interests and coordinator of the activities performed by the functional sections of the Company in relation to the ship. The basic function of the project manager in this relationship is to build the balance between a ship's demands and the functional sections of the Company, so as to satisfy the interests of the whole.

Besides solving interest conflicts between the whole fleet and a single ship, the project manager closely cooperates with the managerial team on board. In that sense, there appears the integration of interests of the ship and the fleet as well as disburdening of individual functional sections from routine tasks and concentrating on closer examination of each problem.

The team work on board in conditions of matrix organisation is a more progressive and professional form of cooperation because it makes possible the disappearance of the hierarchical

component of the three-man managerial team. The team is still headed by the master with his specific management style as participating and supporting leader who can enact the requirements of the ISM Code without the negative influence of the company; while the other deck officers, and the chief engineer and other engineers, accept his leadership and contribute to his efficient decision-making with their personal participation in searching for the best solutions.

These kinds of relationships both within the ship's organisation and between the ship's organisation and the Company act preventively against the possibility of *complacency syndrome* development.

Finally, although the matrix form of organisation retains the components of hierarchy, it weakens the subjectivity of individual functional departments exposing the responsibility of experts and objectifying information coming from two sources including the ship itself.

Captain Bielić's paper Complacency as an element of maritime accidents can be downloaded from: www.he-alert.org/filemanager/root/site_assets/standalone_article_pdfs_0605-/HE00665.pdf

Seafarers as an investment - not a cost



Ole Stene
President



Guy Morel
General Secretary

International Ship Managers' Association (Intermanager)

The image of the industry is poor. We have to make the image of this profession high; there are cracks in this industry as there are in others, but the majority of the people do a professional job, and that includes the seafarers.

Recruitment is a problem. Some seafarers, especially engineers, do not want to commit themselves to a long term career in the mainstream maritime industry, because they see better opportunities ashore and in the offshore sector.

You need to have this feeling that you want to be a seafarer, you want to manage a ship, you want to be onboard a ship for a certain period because you like it. If it is a case of 'I do this because I have to, because I want a job in the offshore industry or land based', you are not really committed to being a seafarer.

We also have to invest in our seafarers and not consider them as a cost. It doesn't matter if they are onboard the ship and we are in the sitting in the office - we are all part of the same organisation. We are not so important sitting here in our offices - we can go home to our family every evening, we can have a good life, we can have lunches etc. The most important people in any shipping company are the seafarers; they are taking care of the assets, they are there to solve the problems, they are where the problems are, they meet the customers, they are on the ship.

Ship managers have a vested interest in training because, for us, the crew is the basis from which we start to do business. But, training is an investment that the owners have to participate in. We will do the recruitment, we will do the selection, we will do the training and competence building but the owners need to participate and invest in this.

In terms of input to the design of a new ship, this depends on whether the shipmanager

is able to get the contractual relationship with the owner so that they are involved in the final design of the layout of the engine room or of the bridge etc. But, very often the shipowner will call the shipmanager only once all the drawings or the designs are complete. A number of our members have a new building supervision service to offer - if you already have a good working relationship with the shipowner, then you utilise that.

However, in the case of pure third party management the shipowner is likely to work with one

company at creating the design; he will then place the order and then about a year and a half later will have his ship delivered, and will seek a manager. It is not yet in the mentality of all shipowners to involve their shipmanagers from the time of planning and design of a new ship. Yet, very often they do not have the experience that the ship managers have.

We are concerned about the crew - the crew is part of the whole organisation.

If we do not take care of our staff they will not perform very well. Things have changed over the years - as managers we had to accept the diktat of the market and we were reducing our crew sizes. That has been a problem; we have become much too dependant on automatic machinery and on technology etc and not realising that, despite the technology, a man is a man and he has to sleep a number of hours. As shipmanagers we are not so much concerned to make maximum money on the ship, we are more concerned about the wellbeing of our crew, good ship maintenance and a professional approach to the job.

If it was left only to Intermanager to

decide on fatigue issues, we would say that we would be willing to take all the necessary steps to reduce fatigue by, for example, adapting the size of the crew to the particular situation of a particular ship. It is a delicate situation, but in order to do a very good job at operating and maintaining a ship and also respecting the crew in its physical integrity we would want to be careful at managing crew fatigue to the best possible extent; and that includes increasing the size of the crews to levels that are acceptable to human fatigue.

The crew is there to manage the ship. The master is the managing director, the chief engineer is the technical director; their responsibility is to manage the ship and its crew and to be commercially focussed on making sure that the commodity that the ship carries is moving, and is reaching the target on time without any casualty or any damages.

We know of masters, who say they do not have time to 'manage the ship' because when they come alongside they would have several people standing outside the door waiting to do audits - all there to

do the same thing, but for different bodies and authorities. So, the master has to sit there shuffling paper around and taking care of these people because they demand that he does so. These masters were suggesting that

You need to have this feeling that you want to be a seafarer, you want to manage a ship, you want to be onboard a ship for a certain period because you like it.

they needed another person to be their 'office manager'.

We are therefore supporting a project that was launched 2 years ago and has been funded in part by the Norwegian Research Foundation for developing a set of Key Performance Indicators (KPIs) that is acceptable by everybody. The aim is to establish common performance indicators that can be accepted by the whole shipping industry such that when, for instance, Class has been there to audit the ship that audit should be accepted by port state, flag state, oil majors, charterers etc - one audit only.

Then, maybe, the master can do what he is supposed to do.

Fatal Accident whilst discharging wood pellets

This report of a fatal accident that occurred aboard a 29,381grt general cargo ship whilst discharging wood pellets, highlights a number of human element issues, not least that guidelines and safety procedures were not properly adhered to.

A small amount of wood pellets was left inside the hold, and the ship's gantry crane was not able to reach the edges of the hold to clear up all the pellets. It was normal practice to use a bulldozer to group the remaining wood pellets at the centre of the cargo hold for grabbing. Accordingly, a bulldozer was lifted into the hold; an ordinary seaman and a bulldozer operator entered the hold through an enclosed stair trunk to release the hoisting sling attached to the bulldozer.

When the ordinary seaman reached the bottom of the stairway he collapsed and lost consciousness. Soon afterwards the bulldozer operator also collapsed. The ordinary seaman subsequently died and the bulldozer operator was seriously injured. Eleven persons who served in the rescue team felt physically uncomfortable and were admitted to hospital for observation.

According to the Code of Safe Practice for Solid Bulk Cargoes, 2004 (BC Code), the

wood pellets may be subject to oxidation, leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo spaces or communicating spaces. Oxygen and carbon monoxide meters should have been used before entering confined spaces; and, entry of personnel into cargo spaces or communicating spaces should not have been permitted until tests had been carried out to ensure the spaces were safe.

The report concluded that, while the shipboard safety management manual (SMM) stipulated the safety precautions to be taken before entering enclosed spaces or confined dangerous spaces - including the enclosed cargo hold and access trunks - the SMM procedures had not been complied with by the master and crew, particularly in relation to the ventilation and the testing of the atmosphere in the enclosed stair trunk, and to the completion of the 'enclosed space checklist'.

The investigation identified a number of contributory factors, not least that the crew did not observe the guidelines stipulated in the BC Code; the crew were unaware that wood pellets inside cargo holds could emit carbon monoxide; and that a warning sign 'Low Oxygen Risk Area'

on access hatches was faded and illegible.

The report recommends that the SMM should include a number of safety procedures for the carriage of wood pellets, including:

- The enclosed stair trunks to be properly ventilated preferably by mechanical means and tested for the safety levels of oxygen and carbon monoxide prior to the entry of personnel;
- The master and crew members to be well aware of the safety requirements stipulated in the BC Code.
- Appropriate warning signs to be displayed at the entrances of the stair trunks.

Those who are involved in the management and operation of cargo ships, particularly ships that are likely to carry wood pellets, are strongly advised to read the reports of the Marine Accident Investigation Section of the Hong Kong Marine Department (www.mardep.gov.hk/en/publication/pdf/mai061116_f.pdf) and of the Swedish Maritime Administration (www.transportstyrelsen.se/globalassets/global/sjofart/english/accident_investigation_reports/e_2006/2006_11_16_the_bulk_carrier_vrw_w5_saga_spray_fatal_accident.pdf)

Reports & Studies

PERCEPTIONS OF RISK IN THE MARITIME INDUSTRY

N Bailey, N Ellis, H Sampson, Lloyd's Register Educational Trust Research Unit Seafarers International Research Centre (SIRC)

These first two of a series of three reports consider perceptions of risk in relation to ship casualty and personal injury across the maritime industry. Specifically, data is interrogated with regard to differences in perception according to rank, department, nationality, age, and seafarers' length and nature of experience (e.g. ship type). The reports are based upon data collected via a questionnaire survey of 2372 seafarers from 50 countries conducted in 2006.

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ALARM MANAGEMENT STRATEGIES ON SHIPS BRIDGES AND RAILWAY CONTROL ROOMS

Paul Traub, CCD Design and Ergonomics

This paper compares and contrasts alarm management approaches from rail and maritime sectors and seeks to distil best practice from both industries for application to robust, usable and pragmatic alarm management for these hazardous environments.

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THE ALTERNATIVE WATCH SYSTEM: A CRITICAL ANALYSIS

Pik Kwan Rivera, Office of Human Element and Ship Design Division, US Coast Guard

This article from the US Coast Guard Crew Endurance Management Newsletter, Volume IV, Issue 3, argues that it is important to recognize that implementing a watchkeeping schedule without managing other shipboard personal,

organizational and environmental factors can actually sabotage the potential benefits of even the best designed work schedule.

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FATIGUE AT SEA - A FIELD STUDY IN SWEDISH SHIPPING

Margareta Lützhöft, Birgitta Thorslund, Albert Kircher, Mats Gillberg, VTI, Sweden

A report that explores ways to reduce fatigue levels of bridge watchkeeping officers. The purpose of the study was to collect data about the fatigue level of bridge watchkeepers to use for revising earlier sleep models and to devise innovative solutions for the shipping industry. Data collection included interviews with shipping companies and a field study onboard 13 cargo vessels, involving 32 participants.

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This bulletin is distributed and promoted with the kind support of: Association of Maritime Education and Training Institutions in Asia Pacific (AMETIAP); International Federation of Shipmasters' Associations (IFSMA); International Institute of Marine Surveying (IIMS); Institute of Marine Engineering, Science and Technology (IMarEST); International Maritime Pilots' Association (IMPA); NewsLink; Royal Institute of Navigation (RIN); Royal Institution of Naval Architects (RINA)