November 2016 www.nautinst.org

Seaways

The International Journal of The Nautical Institute

Navigation assessments

Getting it right p08

The Nautical Institute

Philip Wake OBE MSc, FNI Chief Executive

Focus

Getting navigation right

> Our stance on CPD is simply that the CoC, at whatever level, is not the end of the professional learning road but merely a baseline that we all must achieve

Are your checklists fit for purpose? This is the question posed by Nippin Anand and Øssur Jarleivson Hilduberg in their article 'Imaginary checklists and defensive procedures' (see p12-15). They have set out the essential differences between procedures and checklists with a useful case study. In many accident and near-miss reports, including those submitted to our Mariners' Alerting and Reporting Scheme, the failure to follow procedures is identified as a predominant cause. However, as pointed out in the article, it is seldom that the investigation questions why the procedure was not followed.

We all have many policies and procedures in our organisations that are regularly reviewed to meet the changing needs of the business. The same is true of procedures implementing the ISM Code onboard. Companies should have a review process that fully involves the ship's staff who carry out procedures. Whilst standardisation of procedures across a fleet is desirable, it is rare that a 'one size fits all' approach can work. Procedures and associated checklists must work for the ship and her crew and the 'tick box mentality' must be challenged. A more meaningful and thoughtful approach to completing checklists will ensure that operations are properly carried out.

Due to the increasing collisions, groundings and strandings, navigation assessments are becoming increasingly popular amongst ship owners, operators and insurers. The Institute identified some while ago that there was a need to establish best practice in carrying out navigation assessments. We are delighted to publish Captain Harry Gale FNI's book on this subject (see p8-9). As ever with Institute books, it draws on input from a range of industry experts, our Sea-Going Correspondence Group and personal research into practices onboard various ships. It also includes a case study where a tick box audit had not identified weaknesses in navigation practices and resulted in a casualty.

The value of certification

A question was posed to me recently by a member as to why the Institute was seemingly devaluing the Certificate of Competency (CoC) by focusing on the need for Continuing Professional Development (CPD) and other specialised certificates. I was told that this could be undermining the confidence of young officers, which is certainly something that we do not wish to do.

In fact, *The Navigator* magazine is produced with the specific aim of increasing the professional knowledge and confidence of these young officers. Our stance on CPD (see p16) is simply that the CoC, at whatever level, is not the end of the professional learning road but merely a baseline that we all must achieve.

There is a concern within the industry that an STCW CoC is not necessarily a reliable measure of an individual's competency because there will always be the need to gain experience and learn about subject areas not covered within the certification syllabus. Although there will be those who would argue that pre-STCW CoCs were a true measure of competency, this additional learning is essential to keep pace with changes in the industry and be truly competent.

The views of Captain Yves Vandenborn AFNI of The Standard Club also show why it is necessary to go beyond the CoC knowledge level. The Standard Club are one of the organisations putting *Navigation Assessments – A guide to best practice* into practice.

In the Third Officer column this month, the young Kumail Raza tells us his needs for development and mentoring. He is realistic about where he stands in the profession and is a powerful advocate for our promotion of mentoring (see also Captain André Le Goubin FNI's 'Mentoring Moments' p6-7 which shows that mentoring does not need to be a time consuming and overly formal process). This article can also be viewed and shared on the NavInspire blog (www.nautinst.org/NavInspire). We hope that his article will inspire others to tell us their story. Mr Raza came to our attention through his feedback on *The Navigator* magazine which has helped give him the confidence to write. These are the reasons the Institute continues to strive to support all our members, new and old, throughout their career.

p04

p06

p08

p32

Mariners' Alerting and Reporting Scheme

MARS Report No. 289 November 2016

MARS 201658

Fire in a container

Edited from official report of the Danish Maritime Accident Investigation Board, April 2016

➔ A 9000+ TEU container ship was underway when a fire alarm sounded in cargo hold nine and smoke was seen coming from the hatch in the same area. The general alarm was activated and crew went to their muster stations. The Master reduced the ship's speed and altered course to direct the smoke away from the deck area.

Approximately 16 minutes after the alarm, a two man team equipped with breathing apparatus (BA) entered the cargo hold to find the location and extent of the fire. They had difficulty entering and manoeuvring in the hold, struggling with the pressurised fire hoses due to the hose couplings becoming stuck whenever passing a manhole. The firefighters saw no flames and felt no significant heat while searching for the fire. When the air supply was running out after about 20 minutes, they made their way back up without having been able to locate the source of the fire. Once on deck they briefed the second firefighting team.

The second firefighting team, also with BA gear, entered the hold to continue the search. They identified a container located between three and four levels down on the starboard side as the probable source of the smoke. At this point, the crew still had no knowledge of the extent and severity of the fire, nor the contents of the containers affected. While the firefighting teams were deployed in the hold, their colleagues on deck had established boundary cooling of the adjacent areas. With the information provided by the firefighting teams, it was decided to deploy the ship's CO_2 extinguishing system.

The first attempt to release CO_2 failed due to technical irregularities on the main pipeline. The main distribution valve to the cargo hold was then manually opened, and a second section of CO_2 cylinders was discharged, this time successfully. However, the CO_2 discharge did not give the required results.

Some time later, a team entered the fire area with the ship's special 'container firefighting equipment'; a cordless power drill, a hole saw bit and a spike nozzle. However, the power drill was not able to penetrate the container door. It was decided to close the hold, maintain the cooling, and allow the crew some rest and time to consider alternative approaches. Later, another attempt at placing the spike nozzle in the burning container was successful, this time using an angle grinder to cut the container open. A spike nozzle was inserted and water injected into the container; soon after, the fire was considered under control.

Spike nozzle inserted in container door of burning container

During the second day of the incident, smoke and steam in increasing amounts were again observed coming from the cargo hold. A firefighting team entered to investigate and evaluate the situation. When they returned, they reported elevated temperatures in the containers adjacent to the one which was burning. During the following 12 hours the situation was kept under observation. Another three teams entered the hold during that period to measure temperatures and check the water level in the hold. Based on these evaluations, it was decided to cut holes in the two adjacent containers and flood them with water as well. Since only one special container 'spike nozzle' was available and had already been used, the crew inserted standard fire nozzles into the two containers.

On the third day after the initial fire, as the vessel made way to a port of refuge, small amounts of smoke and raised temperatures were reported from cargo hold eight, just forward of the original fire location. The firefighting teams that entered hold eight reported smouldering charcoal spread around the decks in the hold as well as significantly raised temperatures in the containers nearest to where the smouldering charcoal was found. The ventilation and power supply to hold eight was cut, and firefighting teams equipped with hoses were able to extinguish the smouldering charcoal within 1½ hours.

As the vessel approached the port of refuge, four days after the initial fire outbreak, a salvage team came on board and was immediately put in charge of the firefighting efforts. Once berthed, the still burning container was discharged.

Lessons learned

- The fire originated from a container of charcoal that was susceptible to spontaneous combustion and should have been declared as a dangerous cargo – but was not. Mis-declared cargo, in containers and in bulk, continues to be a risk worldwide.
- Seafarers cannot be expected to have a level of experience equal to that of professional firefighters. Firefighting preparedness should be carefully considered when designing equipment and work procedures to be used in an emergency situation on board ships.
- Procedures, checklists and decision support systems alone cannot ensure a successful outcome of an emergency situation. Actual drills and equipment tests are an integral part of crew preparedness and effective response.
- The increased size of ships and their cargo capacity has seen corresponding amendments to regulations such as adding an increased number of fire hydrants and hoses. However, these regulatory changes have not included a reconsideration of the strategies and methods used in emergency situations on such ships.

■ **Editor's comment:** Vessel operators, managers and owners may also wish to consider how manning levels are to be evaluated given the size of their vessels and in light of realistic emergency responses that may be necessary, as highlighted in this report.

MARS 201659

Rudder stock proves vulnerable for ship security

➔ A bulker completed loading operations and officials conducted an underwater hull inspection with video recording as per port authority requirement. The vessel's hull was found free of any suspicious objects. At the same time, customs officers checked the vessel interior, including the rudder trunk, which was almost filled with water. Some parts of the rudder trunk were inaccessible and could not be checked but the vessel was cleared for departure all the same.

Later, during discharge of the cargo, a team of custom officers attended the vessel. During their detailed search drugs were found hidden in the rudder trunk. The investigation revealed that there was a lack of proper guards around the rudder stock (image below), allowing potential unauthorised access for drug trafficking purposes.

Lessons learned

- Even detailed searches prior to departure can sometimes be inadequate due to the inaccessibility of some areas of the vessel. Sometimes, the best defences are physical barriers on the inside and outside that limit entry (see images below.)
- While in port always remain vigilant; any suspicious activity around the vessel should immediately be reported to the Master.
- Is your rudder stock vulnerable to unauthorised access?

MARS 201660

ECDIS slip-up

➔ A cargo vessel had recently been changed over to paperless navigation using ECDIS units. While at anchor, the OOW carried out a performance verification of the vessel's ECDIS. After he had been relieved of his watch, the new OOW noticed that the chart alert settings for safety depth and safety contour had not been changed back to those specified in the active passage plan; they were still the same as those used during the performance verification. These were changed and the officer concerned was informed.

After the incident an informal bridge meeting was called by the Master and all officers were briefed on what could be classified as a near miss.

The company investigation found that the officer who had conducted the test was working on the equipment for the first time. Although the officer had completed a type-specific ECDIS course prior to joining the vessel, apparently performance data checks had not been discussed during the training.

Lessons learned

- Whenever any tests are carried out on any equipment which requires changing of basic settings for testing purposes, they should be reverted back to the original settings immediately after completion of the test.
- When in doubt or if you have not had the training to undertake a task, ask someone who knows.

MARS 201661

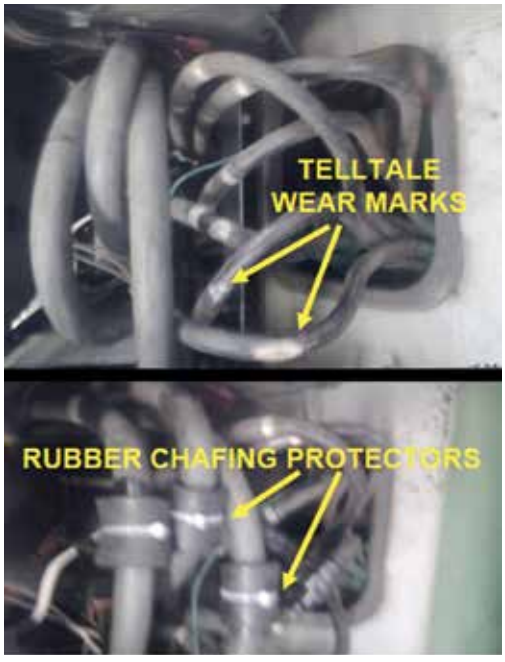
Vibration hazards

As edited from United States Coast Guard (USCG) Safety Alert 02-16

➔ A tow boat and associated tow were underway. Unexpectedly, the main generator tripped offline and electrical power was lost. Power was quickly restored by a standby generator and the vessel and tow remained under control.

It was found that one of the primary leads exiting the generator housing had chafed against its steel enclosure, causing it to ground out. Investigators determined that other vessels operated by the same company had similar generators and wiring arrangements. Inspection of those generators showed similar signs of chafing and abrasion, but the wiring had not yet reached the point of failure.

Before



After

Lessons learned

- Vibration is a well known causal factor in fuel oil spray fires. While this situation is different from a failed fuel line, the unsafe condition leading to the failure is similar.
- Always consider what could happen as a result of vibration. Inspect at-risk areas such as piping systems connected to the engine, engine mounts, pipe clamps, wire bundles, brackets, and areas where connected components pass through decks or overheads.

MARS 201662

No oil mist detector means a warning too late

➔ An oil/chemical tanker was underway. In the early morning hours a main engine lube oil separator alarm sounded on the bridge and, due to the vessel being UMS [having an unmanned machinery space], in the chief engineer's cabin. The chief engineer called the bridge and informed the OOW that he was entering the engine room. He went to the purifier room and noticed the lube oil separator's discharge pressure was low. He adjusted the discharge pressure but immediately the separator's alarm activated again. On his way to the engine control room to acknowledge the alarm, the chief engineer saw there was now smoke in the engine room. He also noticed that the main engine turbocharger was surging and the main engine was hunting.

He called the bridge and told the OOW to put the engine pitch to zero. He then stopped the main engine by emergency stop. The vessel was blacked out for a short time before a diesel generator came on line. The chief engineer now saw that all the crank case relief valves of the main engine were opened.

Meanwhile, the Master had come on the bridge and the vessel's position, set and drift were verified and the anchors prepared for use. After about 10 hours drifting the vessel reached favourable depths for anchoring, and was anchored. Meanwhile, it was found that the main engine crankshaft had seized, so repair by ship's crew was not feasible. Shortly thereafter the vessel started to slowly drag anchor. The Master and company emergency response team agreed to use tug assistance to proceed to a repair facility. Later that day the tow operation was begun and the vessel brought to a port of refuge.

The company investigation found that a crankpin bearing had turned in place, thereby clogging the oil cooling hole and causing the subsequent cascading sequence of damage that culminated in the crankshaft seizure. The company had always followed engine manufacturer's maintenance recommendations and was using manufacturer's spare parts.

Due to size of the engine (less than 2250 kW), and in compliance with SOLAS, it was not fitted with a crankcase oil mist detector or engine bearing temperature monitors.

Lessons learned

- Crankcase oil mist detectors or engine bearing temperature monitors are a very good investment even for smaller ships that are exempt from having them by international regulations; they can give an early warning of engine anomalies that, otherwise undetected, can cause serious damage.
- Planned maintenance should be at least as rigorous as manufacturer's recommendations. Consideration should be given to exceeding those recommendations in order to further reduce risks.

MARS 201663

A new ship – an old problem

➔ A tanker was undergoing ventilation of two cargo tanks in preparation for tank entry. Due to the fact that the vessel was new this was the first time the gas freeing fans had been used. Once it was determined that ventilation had been of sufficient duration to ensure safety, tank entry was attempted by crew equipped with personal gas alarm monitors. One of the monitors sounded showing high carbon monoxide and low oxygen so the crew exited the tank without consequences.

The investigation found that the ventilation equipment supplied was of insufficient capacity and so proper ventilation was not achieved as expected.

Lessons learned

- When entering a confined space always use personal gas monitors, properly calibrated and bump tested.
- Follow your company's enclosed space procedure to the letter.
- Never assume ventilation has been adequate simply based on a time-volume calculation; test before entering a confined space.

MARS 201664

A small spill gives important lessons

➔ An oil tanker, fully loaded with crude oil, was berthed and ready for discharge. Prior to discharge operations a safety meeting was conducted and the ship-shore safety checklist completed between the vessel and the terminal. Discharge commenced with three cargo arms. The deck, manifold and pump room were closely observed for any leaks. Discharging pressure was then increased without any signs of abnormalities.

As discharge continued, a deck watchman became aware of a black stain on the top of one of the shore cargo arms, although he did not see any actual leakage. He informed the cargo control room and the information was passed to the fire and safety watchman and the shore terminal.

Later, terminal staff arrived on board. With vessel staff, they tried to identify the reason for the stain. Shortly thereafter it was observed that oil was dripping from the shore cargo arm to the deck and manifold drip tray. Terminal staff stopped the leakage by pulling the vacuum relief valve handle. The discharge operation was not stopped, because everyone was convinced the source of the leak had been corrected. The vacuum relief valve and all shore cargo arm systems were kept under close scrutiny until the end of discharge operations with no further leaks observed.

During further investigation and checks by the terminal staff on their systems some oil was spotted on the water between the vessel and shore; some cargo had dribbled down from the shore cargo arm during the leakage from vacuum relief valve, probably less than one litre. The oil residue was quickly cleaned by shore staff.

The cause of this incident was the leaking vacuum relief valve located at the top of one of the loading arms, an area not easily visible. Apparently, this deficiency had been known to exist by shore authorities. Some stains were also seen on one of the other shore arms, though no actual leakage was observed there during cargo operations.


Stains seen on cargo arms

Lessons learned

- Since the vessel crew do not have specific knowledge about shore cargo arms, any potential risks should be discussed and highlighted to crew by the terminal during the pre-discharge safety meeting.
- For oil cargo operations, when any unusual event is encountered or suspected all operations should be stopped and the event fully investigated.
- Any apparent deficiencies of shore equipment seen by ship's crew should immediately be reported to the Master and port authorities.

Visit www.nautinst.org/MARS for online database

The Institute gratefully acknowledges the support of its Nautical Affiliate partners. Through their contributions, MARS saves lives, prevents injuries and contributes to a more effective and safer shipping community. Find out more about our Nautical Affiliate scheme on our website: www.nautinst.org/affiliate

AR Brink and Associates
www.arbrink.com
MARINE SURVEYORS

ABS
www.eagle.org
CLASSIFICATION SOCIETY

BMT Surveys
www.bmtsurveys.com
MARINE SURVEYORS

Britannia P&I Club
www.britanniapandi.com
P&I CLUB

Brazilian Towage Institute
www.tugs.com.br/en-gb
MARITIME TRAINING & CONSULTING

Caledonian MacBrayne
www.calmac.co.uk
FERRY OPERATOR

City of Glasgow College
www.cityofglasgowcollege.ac.uk
MARITIME COLLEGE

Carnival Corporation
www.carnivalcorp.com
CRUISE OPERATOR

Chalos & Co
www.chaloslaw.com
MARITIME LAW

Class NK
www.classnk.com
CLASSIFICATION SOCIETY

Commissioners of Irish Lights
www.cil.ie
LIGHTHOUSE AUTHORITY

Constanta Maritime University
www.cmu-edu.eu
MARITIME EDUCATION

Constellation Marine Services
http://constellationms.com
MARINE SURVEYORS

Epsilon Hellas
http://epsilonhellas.com
MARITIME TRAINING

EuroShip Services
www.euroshipservices.com
SHIP MANAGEMENT

Exmar
www.exmar.be
SHIP MANAGEMENT

Gard
www.gard.no
P&I CLUB

The Gdynia Maritime School
http://morska.edu.pl/en
MARITIME TRAINING SCHOOL

GNS
www.globalnavigationsolutions.com
NAVIGATIONAL PRODUCTS

Hindustan Institute of Maritime Training
www.himtmarine.com
MARITIME TRAINING

IMCS
www.imcs-group.com
MARINE CONSULTANTS

InterManager
www.intermanager.org
SHIPMANAGERS' TRADE ASSOCIATION

International Salvage Union
www.marine-salvage.com
MARINE SALVAGE

Louis Dreyfus Armateurs
www.lda.fr
SHIP OWNER

Maersk Training
www.maersktraining.com
MARITIME TRAINING

Marine Society & Sea Cadets
www.ms-sc.org
MARITIME EDUCATIONAL CHARITY

MES
www.myanmarexcellentstars.com
MARITIME TRAINING

Nea Gnosi
http://nea-gnosi.gr
MARITIME TRAINING

North of England P&I Club
www.nepia.com
P&I CLUB

New Zealand Maritime School
www.manukau.ac.nz
MARITIME EDUCATION

Norwegian Hull Club
www.norclub.no
HULL AND MACHINERY INSURER

The Port of London Authority
www.pla.co.uk
PORT AUTHORITY

The PTC Group
http://ptc.com.ph/
SHIP MANAGEMENT

IHS Safety at Sea
http://magazines.ihs.com
MARITIME SAFETY PUBLICATION

The Standard Club
www.standard-club.com
P&I CLUB

Steamship Mutual
www.steamshipmutual.com
P&I CLUB

The Shipowners' Club
www.shipownersclub.com
P&I CLUB

Stolt Tankers
www.stolt-nielsen.com
TANKER OPERATOR

The Swedish Club
www.swedishclub.com
P&I CLUB

Swire Pacific Offshore
www.swire.com.sg
OFFSHORE SUPPORT SERVICES

TMC Marine
http://tmcmarine.com/
MARINE CONSULTANTS

UK P&I Club
www.ukpandi.com
P&I CLUB

UK Hydrographic Office
www.ukho.gov.uk
NAUTICAL PUBLICATIONS & SERVICES

Videotel
www.videotel.com
MARITIME TRAINING

West of England P&I Club
www.westpandi.com
P&I CLUB