

Fatigue onboard

Raising awareness: The Nautical Institute reporting plan

David Patraiko BSc, MBA, FNI
Director of Projects

The International Federation of Shipmasters' Associations (IFSMA) asked The Nautical Institute to outline and articulate Institute members' views on fatigue to the 37th meeting of the IMO STW sub-committee in January.

This article is based on David Patraiko's presentation.

Fatigue on board ships exists, leads to accidents and incidents and left unchecked, will create an environment where the retention of qualified crews will be increasingly difficult. Due to a culture where there can be a general disrespect for regulations (not to be confused with the compliance culture) and a 'can do' attitude of seafarers, it is difficult to gauge the extent of the problem because work/rest hour logs do not reflect a problem. However, anecdotal evidence constantly reported to The Nautical Institute indicates that fatigue and manning levels are of major concern to mariners. In response to this the Institute has begun work on a programme to raise the awareness of fatigue on board and promote best practices for management and mitigation techniques.

The Nautical Institute represents about 7,000 members from more than 110 countries – and it is from these members and others that we hear what a major concern fatigue is. In the recent President's questionnaire, 64 per cent of respondents (the highest level) reported that fatigue was their major concern (followed by manning, 60 per cent; collision avoidance, 60 per cent and leadership, 54 per cent). Within the last year the Institute has held five major international conferences in Norway, the UK, India (Mumbai and Delhi) and Singapore, none of which were targeted at fatigue but in all of which discussions quickly came round to the problem. Further reports come from MARS, letters to *Seaways*, meetings and

ship visits. Pilots are quick to recognise fatigue in vessels arriving in port, with one reporting:

'It is sometimes obvious that the master on a master-plus-one-mate coaster is exhausted on occasion. This is exacerbated in poor weather. I have boarded such vessels and it is not uncommon for the master to be resting when the pilot boards or disappear soon afterwards, blatantly ignoring his responsibilities. It could, of course, be argued that it is better he rests and is available at a more critical point in the passage.'

However, perhaps more alarming are comments from pilots about how tired the crews are when they leave again.

It is for this reason that The Nautical Institute wants to participate with the industry to get these issues out in the open, where they can be addressed. One major problem that needs to be recognised is that STCW/ILO work- and rest-hours logs are routinely falsified on some vessels. We do not know how widespread this is but it is more than an inconsequential percentage. It has been reported to us in public forums, in correspondence, in MARS reports and in person.

I myself recall that during an inspection a few years ago, while working as a surveyor, I inspected an immaculately maintained work-hours log indicating that everything was within regulations; it was only afterwards, during a casual conversation with the chief mate, that he confessed how tired he was because he

had been working flat out for three days preparing for the inspection.

The seriousness of this practice of 'flogging logs' extends beyond the issue of falsifying records because it leads to the undermining of authority and general disrespect for the application of all regulations. Another member recently reported:

'I really do not enjoy asking my crew to sign off anything that is not true, or at the very least useful in some way... After complaining to management soon after I joined about time-wasting paper exercises, I was told in no uncertain terms that it is normal and the only possible way to comply.'

Regulations and research

All this is happening despite some very good, comprehensive regulations and guidelines on fatigue and safe manning. One of the best is IMO's own 'Guidance on Fatigue Mitigation and Management' (MSC/Circ. 1014 – part of which is reprinted on pp 7-9). Regulations are explicit and implicit in STCW, ILO, the ISM Code, guidance provided by the US Coast Guard (in its Crew Endurance Management practices) as well as a wealth of knowledge from a wide range of other industries. Other sources of research and guidance include the UK MAIB (bridge watchkeeping safety study); recent studies reported to the IMO from the governments of the Netherlands and Korea; Seafarers International Research Centre (SIRC); the Swedish Transport Institute (VTI); and the Hong Kong Shipowners Association.

Fatigue can be hard to define and measure, it can incorporate many issues such as work, boredom, circadian rhythms and the quality and quantity of rest. Lack of rest and fatigue can accumulate; in fact long-term fatigue even within recommended work hours is becoming more prevalent. Our manpower shortage in some sectors is leading to longer sea terms due to the inability to find reliefs. To many mariners, however, a simple definition of fatigue could be: long hours plus stress. If we accept that the seafaring profession

has traditionally required long hours to be worked, the causes of stress in our current environment need to be examined.

Stress at sea/in port

Although the IMO's guidance on fatigue management extensively details sources of fatigue, some areas of increased stress on mariners are worth reviewing:

- Physical environment – issues of temperature, vibration, motion, light etc;
- Commercial environment – more demanding targets for effective operations at sea and in port (real or perceived);
- Political environment – lack of respect from shore workers and management, fear of criminalisation and liabilities; and
- Personal environment – look at family problems, mental health, shore leave, drugs and alcohol abuse.

The best way to recover from fatigue is by rest; but the ability to relax on board can be compromised by the difficulty of finding time (often impossible in port); the fact that 'hours of rest' are not always spent asleep but are used for eating, sleeping, studying and so on; the need for the physical environment to be conducive to rest; the need for a social environment; and training for the crew in relaxation techniques.

This final point is a tricky one. As the issue of fatigue becomes better recognised, it is far too easy for people ashore to talk of fixing the situation through diet and exercise. However motivation is the key – you can't take a mariner who has a penchant for fried food and movies and ask him to eat salad and exercise in order to become a more commercially efficient employee.

Increased stress for officers at sea includes the following factors:

- Ships are larger, faster and navigate to closer tolerances of navigational hazards;
- Navigation watches have fewer people and more technology. Although properly designed and implemented technology can help, technology often needs to be individually monitored. It can be distracting in cases of alarms or poor human-machine interfaces (HMI);
- Poor training can result in technology appearing intimidating;
- Increased environmental regulation workload;
- Risk of piracy and terrorism;
- Non-navigational tasks being performed on the bridge such as communications (GMDSS, VTS, commercial) and cargo monitoring;
- Commercial pressure for speed in reduced visibility;

Seaways March 2006

- Emphasis on paperwork and documentation.

Once mariners retuning to port after a rough sea passage could look forward to a bit of rest in port but times have changed and ports are often far more stressful than time at sea. Stress for officers in port has increased due to:

- Pressure for fast turnaround times, often to catch weather or port movement windows;
- Proliferation of inspections, often carried out with hostile attitudes and always during cargo operations;
- Extra burden of security;
- Environmental regulations workload;
- Liability and criminalisation risks.

With these increased demands, why do mariners take the self-defeating step of falsifying work hour logs? I suggest this comes out of the 'can-do' attitude of seafarers. The very nature of the job breeds a culture of self reliance, which is admirable in general, but often leads to the continuance of bad design, unworkable procedures and poor regulations. In many cases, if conscientious mariners don't alert management to pressures and stresses, they cannot hope for anything to be changed for the better. Unfortunately, however, I suspect that in many cases management does not want to hear about problems: in extreme cases employment can be at risk for those intent on compliance with regulations. There can also be vast discrepancies in the interpretation of 'work' and 'rest' hours. If a chief mate remains on deck due to lack of confidence in a junior officer during cargo operations, is he 'working' even though he may be 'off duty'? And if day workers are knocked off for a few hours during the day for 'rest hours' if a late departure is anticipated, will they actually rest?

Incident reporting

The Nautical Institute is encouraging the reporting of situations that have resulted in fatigue. The objective is to make these reports publicly available via our website so that all those dealing with this issue may better understand the reality of the situation onboard ships around the world. They are not meant to apportion blame but rather to provide illustrative accounts of onboard environments as they exist today. The reports are, therefore, 'hypothetical' and confidential.

Here are a couple of typical examples from received reports:

- **Container ship.** *Coming from Australia through Sunda straits and Gelasa straits, the crew is*

continuously on anti-piracy watches; at night on bridge we have continuous lookouts. Then approaching the sunken wreck off Horsburg lighthouse at midnight, we transit the straits of Singapore at 20 kts en route to Malaysia ETA 0500 hrs. High speeds have higher stresses, as when overtaking in such narrow traffic separation scheme at a closest point of approach of two cables at times. We get pilot on arrival then berthing stations followed by cargo ops. There are three gantry cranes in operation, which means that besides the duty officer and gangway ISPS watch, there are two more seamen on deck to check for any container damage, reefers plugging and unplugging etc. The Chief is off, being busy with preparing IMDG cargo lists, reefer lists and checking stability and ballasting/deballasting operations. In addition, in port there are mandatory items like lifeboat lowering (though not every voyage) or checking the pilot-side access door's watertightness through the underdeck passage (can maintain these only in port). Completed cargo ops around 1400 hours. Departure station, mandatory stowaway search as per ISPS, undocked and pilot off around 1530 and then transit Singapore straits to arrive eastern boarding grounds around 1800 for pilot, berthing around 1900 hrs.

Arrival Singapore: cargo ops again, three or sometimes four cranes and to top it, there is crew change, provisions, stores and bunkers. This continues till 1300 hrs the next day followed by departure stations and then transit Singapore straits. Bridge manned by master, duty officer, lookout and at night, anti-piracy watches for two nights transiting Gelasa and Sunda straits for the next two nights. So whichever way you look at it, no one on board is spared the fatigue levels. Rest hours are violated every voyage.

Considering the high traffic density, entering and departing Singapore is a very stressful exercise for the master in particular and the ship in general.

- **Joining for the first time as a tanker master.** *It is planned that you join your vessel in the US after briefing at an Asian city. Generally contracts and tickets are given a few hours' prior to flying. Once you*

arrive at the city after a long night flight, you are asked to make your own hotel arrangements. After getting freshened up you go to the office for briefing. Still jet-lagged, you are given a briefing that is often done in such haste that you will reach the ship totally confused and tired. Everyone wants to brief on their section without bothering to see if you understand it or not. Towards the end you are asked to sign a briefing form. In the office you are informed that ship is due to complete loading and you will get about four hours for takeover. In this time I think you can only take over the cash and sign and get ready to face the consequences as and when they come. Anyway, too late to react. Once you are seen off with good wishes from the office, you are in the hotel not to take rest but for your next flight. After picking up your luggage you are at the airport with a stopover in some country to change flights.

After such a long flight, by the time you arrive in the US you are tired, exhausted and terribly jet-lagged. From the airport you are thrown on to the ship where another anxious person is waiting for you to listen to him, take over the cash so that he can wash his hands of it and say goodbye with the parting shot that his tenure was beautiful and he never had any problems. Now, if something goes wrong who will be responsible?

The next port from Houston is about 33 hours away. There you have discharging operations. After discharging, you sail back to Houston for loading. In this time you have to prepare tanks for loading, send all mandatory messages to USCG, get familiarised with the vessel, certificates etc. If before joining the master is supposed to go to the office for briefing, isn't it necessary for the master to be adequately rested before reaching the vessel? Can't this briefing procedure be done over three days so that it is done in a proper way and the master gets enough rest?

What to do?

We want to encourage all mariners to report issues leading to fatigue, both as 'hypothetical' situations and confidentially. All reports will be vetted for 'realisticness'; disidentified and posted on our website.

We also encourage all those in the industry to use these reports to better acquaint themselves with these realistic situations in order to promote practical solutions.

Crew fatigue on board is a complex issue that will require the cooperation of all industry sectors and stakeholders. We must certainly take a closer look at the manning levels in relation to the tasks that need doing. A blanket proposal to add another crew member to all vessels will not be the best answer for the industry (even if they could be found) but, adding the correctly skilled person to certain types of ships on certain runs may be the best solution. Arthur Bowring's article on pp 10-12 outlines some of these options. All new regulations should be assessed for their 'task impact' on crews, including any excess workload involved in implementation. We need to ensure that all operational workloads, including management and commercial, are taken into account when setting 'safe' manning levels and we must create an environment for honest work-hour reporting so that the industry can better assess and manage fatigue.

Much more can also be done to manage and mitigate fatigue onboard within existing manning levels. The US Coast Guard's Crew Endurance Management practices outline how a small team can take ownership of fatigue issues onboard, identify issues and work with management to address them. In one example, a crew identified that a single door between an accommodation space and the engine room was allowing heat, fumes and noise to disturb the rest of anyone in the area. After consultation with management, a secondary door was installed to reduce the disturbance. Many companies have also experimented with alternate watch schedules, and we hope to feature some of these in future issues of *Seaways*. Others have looked at the practices of other industries and found some success with models such as aircrew fatigue evaluation (SAFE); and Fatigue Audit InterDyne (FAID).

The Institute will also look at the possibility of applying the artificial intelligence tool known as 'constraint based reasoning'. This technique is increasingly used to schedule logistics and may be used to create more realistic manning models.

Other options exist to augment onboard manning, such as increasing personnel in port to assist with inspections or cargo operations or by reducing onboard administrative burdens through the use of

information and communication technology. With the advent of fixed-price, high bandwidth ship-shore communication links, it will be possible to delegate many time-consuming administrative duties to shore-based personnel. There is also no excuse for anyone concerned with onboard fatigue not to raise awareness of the problem with those on the ship and address some of the basic issues relating to diet, exercise, relaxation techniques and physical condition, as outlined in the IMO documentation and elsewhere.

For our part, The Nautical Institute will continue its cooperation with IFSMA and other organisations to raise the awareness of fatigue issues on ships. We shall work through our members, branches, the human element initiative and publications to promote best practice for managing and mitigation techniques. We also strongly urge shipowners/managers and government administrations to more clearly define task management and realistic manning levels for safety and effectiveness. We would like to see the creation of an environment for the realistic reporting of work/rest hours and of fatigue problems, and the encouragement of research into the effects and mitigation of fatigue. A concerted effort to reduce the effect of criminalisation and poor respect of shipboard personnel by those ashore will also be crucial for reducing fatigue as well as retaining quality crew. An international workforce of competent and capable (non-fatigued) seafarers benefits all those in the industry and the world.

■ All projects, documents and research mentioned in this report will be available or linked to from www.nautinst.org/fatigue

Fatigue reporting

All mariners are encouraged to report issues relating to fatigue to The Nautical Institute either as a hypothetical example and/or confidentially. After being assessed and disidentified, these reports will be placed on publicly accessible database located at www.nautinst.org/fatigue

Reports can be submitted to fatigue@nautinst.org or filed anonymously via our web-based reporting form, or sent by post to Fatigue Reports, The Nautical Institute, 202 Lambeth Road, London SE1 7LQ, UK.

Trainers in particular are encouraged to promote reports from their students.