IFSMA – 31st General Assembly

"Missing the point - the failure of regulation. So back to basics?"

Jon Gray, Individual member.

Bio data.

Jon Gray is a director of Inserve Ltd, a company set up in February 2003 by the bringing together of four like-minded surveyors and consultants. The firm now has seven surveyors, four in the UK and others in Greece, Panama and Shanghai. Inserve primarily carries out risk assessment surveys of ships and companies on behalf of hull and machinery insurers, very often for London underwriters. Inserve's clients now write "subject to an Inserve risk assessment or technical appraisal" or similar in many policy wordings.

Jon is the master mariner on the team and he also makes use of his experience as an ISM Code lead auditor and an ISPS Code auditor. Jon was 18 years deep sea on various ship types although mainly tankers; he also spent some time offshore and on coastal ships. He was an ISM and QA auditor in Lloyd's Register of Shipping at the time of the inception of the ISMA Code and the ISM Code, and was one of the first qualified auditors. He set up his own company after leaving LR and still carries out ISM audits as well as audits of Recognised Organisations and ship inspections on behalf of Flags.

Introduction.

ISM has stagnated. ISPS is a dangerous knee jerk reaction. Class has lost its way. Flags are more interested in revenue. Increased multi-cultured / national crews. IMO toothless. Charterers a lost cause. No job security. Inconsistent & inappropriate manning levels. Increased paperwork, advanced fatigue. Criminalisation of the Master.

There is an increasing widening gap between what is fact on board and what is necessary.

Perhaps risk based loss prevention is the answer?

Inserve has carried out hundreds of risk assessment surveys in the past two years and have found worrying holes - with potentially far reaching consequences.
This paper shows the problem areas and suggests that the practical risk assessment approach should be the way forward for all.

Where are we now?

While the statements above may offend some, while there may be many who would dispute some or all of what is said, I believe that all these statements are true and are having a significant effect on the industry – a detrimental effect.

The regulators and those with the power and / or ability to deal with the situation are increasing the amount of prescriptive legislation, saying that it is risk based, but we see little evidence that it is having an effect.

We know that more than 80% of failures are due to human error and some organisations are looking at high tech methods and complex ways to deal with human issues on board. While these may be appropriate to some of the blue chip operators, the basic issues of lack of experienced officers and ratings, multi-national and multi-cultural crews, insufficient manning, inadequate training, language difficulties and lack of appropriate maintenance are problem areas that seem to have been ignored.

It is easy to blame the industry for the conditions that we see but we continue to be astonished at the lack of basic care that some crewmembers and company managers appear to have; they seem to have no consideration for their own lives, their families or their workmates.

It is true to say that the number of insurance claims has reduced slightly but this is mainly due to higher deductibles and changing insurance conditions. From the perspective of hull and machinery insurers, the spectres of fire, catastrophic machinery failure and total loss are still there.

What is the evidence?

Fire.
Fire is still the largest category of loss in terms of cost. All fires can be prevented. Fire is the seafarer's worst nightmare and yet we still find that little thought is given to fire prevention other than the typical no smoking regulations - and even these are not always adhered to.

Older ships often have combustible material in the bulkheads, cabins or deckhead linings in the accommodation and there may be open stairwells. Even where the stairwells are enclosed, doors are removed or lashed back. Consequently, any fire in the lower part of the accommodation will quickly spread and so will the smoke, which may well be toxic.

Simple battery operated smoke detectors fitted at various locations in the accommodation are a cheap method of giving early warning. Carry out a weekly check and change the batteries annually and the risk of the crew being caught by fire is greatly reduced. Keeping the fire doors closed or even fitting vertical subdivision to some of the stairwells will reduce the spread.

Galleys are still areas of concern with oil soaked filters on exhaust trunking. We have seen passenger ships where the oil in the trunking from the main galley is oozing out through the vents to the decks some metres away. Fire doors to galleys, usually fitted with remotely operated electro-magnets, are wedged open or do not close fully as the deck tiling is so uneven.

Laundries on passenger ships are another area of concern with build up of lint in the vent trunking or lint leaking from the trunking into the deckhead space. Often the trunking will pass through various accommodation decks with no fire damper between the laundry itself and the open deck.

Regular cleaning and inspection of galley and laundry trunking, fitting of fixed cleaning systems or removable filters in the hard to access areas of the trunking will help. Consideration of fitting additional dampers to long runs of trunking will reduce any spread of fire. Regular testing of thermostats and breakers on deep fat fryers and other cooking equipment will provide added confidence.

Wiring on older ships is usually a collection of new and old with cropped sections where redundant equipment has been removed. The insulation may be breaking down, often in unseen areas such as where it passes through bulkheads or in deckhead spaces. The result may be a hot spot and a resultant fire.

Regular checking of wiring and checks inside deckhead spaces can be built into the on board maintenance system.

If fire in the accommodation is a worry, fire in the machinery spaces is worse. The machinery spaces are cited as the area most likely to have a fire yet we still find that little attention has been given to the hazards. Oily bilges are still found although this must have been a primary target for regulators in recent years.

However, of more concern are the various hot surfaces in the machinery spaces. SOLAS has gone some way to address the subject. Any surface above 220 C is a hazard. Any flammable liquid, and this includes hydraulic or lubricating oil, at above atmospheric pressure can ignite when sprayed onto a hot surface.

Even now, we continually find exhaust pipes, indicator cocks and other hot surfaces unlagged and with unprotected pipework containing flammable liquid close to it, often directly above or below it. Fuel lines may be loose, vibrating or chafing and a prime source of a leak. Flexible pipework, e.g. rubberised, may be used instead of steel; it is easier to connect but, unless there is a real need for it, steel is far safer – there is no need to worry about wear or perishing.

Hydraulic packs for waterjets, stabilisers and even passenger deck lifts, continue to be fitted with flexible hydraulic hoses where these are not necessary. Diesel engines continue to be installed in ships, fitted with rubber hoses as a means of fuel supply. There is seemingly little consideration given to the failure of these hoses, which casualty investigations show, so often occurs.

In addition to the fire risks associated with hot surfaces and pipework, there is the potential source of fuel for a fire from the contents of storage tanks. We find perspex or plastic gauge glasses which will quickly melt in case of a fire. In addition, because the tank is not fitted with deadweight or spring loaded closers, or if they are, they are secured in the open position, the contents of the tank will fuel a fire. Generally toughened glass gauge glasses should be used and closers shut unless in use.

Deadweight closers on sounding pipes is another issue. Apart from contributing to flooding and pollution in case of impact damage to a tank, any leak oil will also fuel a fire. Again we find the closers lashed open or the sounding tapes or funnels left inside when not in use.

We regularly raise queries over the fire doors in engine rooms. While we understand that ventilation can be a problem, lashing open the fire door between the steering flat (where the emergency fire pump is located) and the engine room is not a sensible approach. Any fire in the machinery spaces could spread to the steering flat, disabling the fire pump and making access to fight the fire more difficult. If there are ventilation problems, we have found that ventilation can be improved by changing the way the fans are used or even moving the motors around.

Emergency equipment and actions.

Should there be a fire we always hope that there will be prompt action to deal with it as soon as possible and prevent it from getting out of control. However we find that training the crew to know what to do if they discover a fire is woefully inadequate - and yet this can save the ship. Simple actions such as closing doors, shutting off the fuel supply and ventilation can have an immediate effect without putting the individual at risk.

We have witnessed fire drills where great amounts of time are spent putting on BA sets and rigging equipment when an attack team could have dealt with the fire or reduced the spread with extinguishers and local equipment.

Most crews seem reluctant to carry out fire drills in the machinery spaces – and yet there are more fires in machinery spaces than anywhere else. The company may leave it up to the master to decide on the location of each fire drill; risk clearly is not a consideration in the programming by either the company or the master.

It is clear from what we witness that many drills, especially for the machinery spaces, that they have not been practiced. A number can only be described as shambolic and if it was not so serious, laughable. They are a clear indictment of the lack of adequate management on board and sometimes of the severe cultural and language differences.

The SMS documentation may indicate that a drill has been carried out but, after a few questions, it is clear that the fire teams never set foot in the area mentioned – it has been discussed but not practiced.

We advocate pre planning drills to ensure that they are realistic and then to have a debrief with all those involved to identify positive and negative points. All these can be fed back to the company so that other ships may benefit.

Should the fire get out of control, the crew know that, in the machinery space in particular, they can use the fixed fire extinguishing system. The industry has moved some way along and satisfactory alternatives have been found for Halon. However we have always had little confidence in CO2 systems. There are always too many subjects to consider when using it; checking crew are clear, shutting ventilation off, closing dampers, boundary cooling. It is also necessary not to wait too long to set it off or to go back in too early.

Despite the less than perfect system, CO2 still seems to be the system most seen, but numerous crews do not know how to operate it - even the instructions are illegible or indecipherable. Sometimes the system cannot be operated because the wires have been disconnected or the activating weights have been wedged to prevent them moving. We have found that the door to the CO2 room cannot be opened without levering with steel bars – a clear indication that no one has been in to check the system.

Hi Fog seems to be the system for the future. It is more expensive to fit than other alternatives to Halon but it has so many advantages. The system can be set off without any worries of people in the area or shutting off ventilation; the system directs the water over the source of the fire while other machinery can still be running; it has cooling effect; the supply of water is endless. We hoped that more shipowners would fit Hi-Fog but it seems that most have chosen the cheaper option without considering the risk reduction opportunities.

With respect to shutting fire flaps and dampers, despite regulators looking at these regularly, they are often poorly maintained so that it may be difficult or impossible to shut them in an emergency. Engine room skylights also may be held open with rusted chain blocks, or jammed open with timber. All this again with the SMS paperwork showing that they have been checked and operated regularly.

Security is a subject that has been commented upon, particularly in connection with possible conflicts with safety. We have seen various emergency escapes secured from the outside, as has been highlighted in the press. We have also seen the normal access doors in the engine room locked with keys from the inside, with only the chief engineer with the key. It is clear that no one has given much thought to the situation.

Watertight integrity.

One of the areas where we are most concerned with respect to watertight integrity is the use of watertight doors. While we have been concerned to see watertight doors continually left open on dredgers working close to obstructions and in busy shipping lanes, we are even more concerned with the use of watertight doors on passenger carrying ships.

Some Flags have provisions for leaving certain doors open in particular situations but it is clear that many companies and masters are more likely to have all the doors open rather than any closed.

Unfortunately to support our view, we have been involved with a number of passenger ships and ferries which have had severe losses due to watertight doors being open when in hazardous situations. The casualties have included a ship passing through a narrow channel. The stabilizers were in use and one of them hit the mooring chain of a buoy in the channel. The stabilizer was pushed back into the hull, piercing it in way of the generator room and consequently progressive flooding affected the main engines in the next space. The ship managed to reach a nearby port with the assistance of tugs but was severely damaged. There was a similar situation with the ferry *Express Samina* when it hit a rock, with resultant loss of life.

Adopting the risk based approach, there are a number of influencing factors. The comment most often made by the crew is that if the doors in machinery spaces are closed it takes more time to pass through when carrying out normal duties. There is a risk that someone passing through the door could become caught if the door closes. Our view is that, provided the crewmembers are correctly trained and the doors appropriately maintained, the risks are tolerable, particularly when they are balanced against the risks of a major casualty caused by flooding. The closed doors may be considered an inconvenience but it will only take a short time before they become normal operational practice.

There is also the view that where the doors are designed to be closed remotely, should there be an incident they will all close within a short period. However, should the ship have impact damage, it is likely that door frames will be buckled, hydraulic pipework damaged or foreign objects will block the doors, all perhaps preventing the doors from closing correctly.

The other thing that crews often forget is to close watertight doors in case of fire to reduce the spread. In a lot of cases, watertight doors are also fire doors.

Our view is that watertight doors should normally be closed when sailing/ arriving, in restricted visibility, in restricted waters, when there is a limitation of the depth of water

compared to the draft, or in any other hazardous situation. Some doors should be closed at all times and some should be closed unless work is being carried out in the adjacent space.

We were impressed to note that, when travelling on a short sea ferry in northern Europe, the watertight doors in the passenger areas were closed prior to sailing and then opened one hour after. It may have inconvenienced the passengers but no one seemed to mind.

In addition to risks of flooding from outside damage, there are always risks of internal flooding. While seachests and sea valves are included in class surveys, we have been surprised, on some occasions, at the poor condition of these and in particular doublers and glassfibre patches on a seachest on a passenger ship. We were also surprised to find that the condition of internal pipework does not seem to come under Class requirements; the Class surveyor that we spoke to was concerned at the condition of the various temporary clamps and patches on large bore cooling water and other lines in a passenger ship engine room but was unable to require owners to deal with them. The ship sailed from drydock with the pipework in the same condition. While any flooding from failed cooling water lines would have been reduced by closing the sea suctions, the loss of cooling water could have risked damage to the machinery or, by shutting down the engine(s), to loss of manoeuvrability.

Machinery.

As well as fire, the main area of concern is catastrophic machinery failure. While a prudent ship operator, supported by a good Class society, will have implemented a maintenance system that addresses all critical components, we come across many where the maintenance system is totally inadequate. In addition, we often find that the engineers are not fully familiar with the types of failures that can occur with the types of engines that they are operating and the specific precautions that are necessary. Again, it is often lack of training or experience, or perhaps insufficient interest.

For example, the greatest area of failure with medium speed four stroke engines is to crankshaft bearings. Crankpin and connecting rod ovality have often been overlooked and resulted in bottom end bearing failures, with serious results. Apart from the damage to machinery, there can be injury to the crew.

Connecting rod bolts have a fatigue limit and these should be renewed according to running hours, but this is also sometimes overlooked. In addition, crankshaft counter-balance weights are known to have caused damage when the securing bolts have failed.

These risks are particularly related to older medium speed engines but can all be reduced if suitable checks are built into the maintenance system.

A number of engineers and companies do not seem to consider these factors.

One of the best ways to identify potential problems is by the analysis of lubricating oil. We have found this to be a weak area with only the minority of operators carrying out regular detailed analysis and reviews of results. Those who do carry out the analysis often do not study the results to establish the meaning of the figures; the applicability of these will often vary with each type of engine.

We are surprised that greater use is not made of the services provided by oil suppliers, particularly as they are often free of charge. Failures of bearings and contamination of lube oil can be identified early on. We suggest that analysis is carried out of the oil from the

main engines and generator engines, and of the tailshaft seal oil, at three monthly intervals. If the engineers also take weekly lube oil checks for viscosity and water using simple on board test kits, there will be further early warning of problems. Relying on the oil mist detector is not enough, by the time that it alarms it is generally too late to prevent damage. Bearing temperature monitoring would be far better.

I mentioned the importance of checking the tailshaft lube oil. The other significant item for the tailshaft is the temperature. This is particularly important for single shaft ships - failure of a bearing could be catastrophic. However again we see that, although the watchkeepers may be checking the tailshaft temperatures regularly, often no one is noting that the temperature is slowly increasing day by day. We always suggest recording the temperature in the log book to assist with this.

There are numerous protective devices on the machinery – low lube oil pressure, high temperature, overspeed, low tank levels - and the crew will rely on these to give early warning of problems and to reduce the risk of major failure. However, to be confident that they will alarm off or slow the engine down at the right time, they need to be regularly checked. We find that most engineers do check them but they often only check that the electrical connections work or look at the gauges as the engine is stopped to see that the alarms go off at approximately the right level. However this does not test that the probe itself or verify the set point properly. To us this rough check is not really enough for protective devices which are designed to prevent serious damage. We always suggest that there is a system for taking out the probes as necessary, testing high temperature probes in an oil bath, physically checking tank level alarms and therefore having real confidence that the devices will work when they are needed.

Overspeed trips are always a difficult subject and they have to be tested with care. Of equal importance is that the crew know how to reset them when needed. There is at least one case where a major casualty occurred to a ship in heavy weather with the engine room flooding and the main engine overspeed trip operated. The crew did not know or were unable to reset it, making the situation worse.

Again we would expect the ship's SMS to address these types of critical devices as well as the fire detectors and bilge alarms but this is rarely the case.

We often carry out surveys shortly after a ship has been taken over by the new owners. We are surprised by the apparent casual attitude shown by some. There may have been no pre-purchase survey, particularly where there is the lure of an imminent lucrative charter, and consequently the new owners find all sorts of problems resulting in an extended repair period before the ship can sail and, in some cases, insurers unwilling to cover the ship until it is brought up to a good standard. Accepting the previous owners' Class and statutory survey certificates is, unfortunately, no guarantee of anything.

Often the newly purchased ship will not have any maintenance records on board and the crew will describe how they found the previous crew burning them in an old drum on the poop. While we are disappointed that any professional crew would act in this manner, it would seem simple for the new owners to have stipulated in the conditions of sale that maintenance records must be included.

The standard of maintenance records and of the maintenance systems themselves is very variable. While we do not suggest the type of maintenance system that there is or how the records should be kept, in many cases, it seems hard for the engineers to see when the last

work was carried out, what it was and when the next is due. Consequently, overhaul of key items such as the crankshaft bearings mentioned earlier, may be missed.

We suggest that the system should show for each component, the time last done (either calendar or hours based), the time between overhaul (TBO) and the time when next due.

Paper.

Although we do not generally concern ourselves much with paperwork, there are two types of paper that we come across – the ship's and crew certificates and the management system. We find various problems with both.

As I have suggested, the ship having valid class and statutory survey certificates is no guarantee that the ship is suitable. All the situations that we commented on previously have been found on ships with a full set of valid certificates and often recent surveys. We regularly have ship managers waving the certificates in the air, claiming that they prove the ship is in fine condition when what we have reported on shows that there are significant risks that have not been addressed by the company, the class society or the flag. We also remind the managers that ultimately the Company, as defined in ISM and other instruments, is responsible.

With respect to crew certificates, despite the best efforts required by STCW 95, there is the ongoing problem of the competency of the certificate holders. We find that there is the view that, as soon as an individual holds the certificate, he is suitable to take over the rank that the certificate qualifies him for. There seems to be little consideration given to the experience needed to be gained first.

There have been various comments made in the press about the perceived stagnation of the ISM Code. This is certainly the impression we have; often the SMS has not been updated since it was implemented in 1998. We always hoped that the SMS would be amended and improved as the company gained more experience but this doesn't seem to have happened too much.

As expected there are numerous checklists in the SMS and, provided that they are used sensibly, we support their use. Carrying out a specific check may reduce the risk of a casualty. However we often find that the "tick the box" approach has been taken, with checklists sometimes photocopied with all boxes ticked off or items checked as correct when the ship does not carry that item. We have recently found checklists written in English where English is not the working language of the crew and it is clear that there is not a clear understanding of each item. When we have questioned this, we have been told that the company required it in English so that port State control and other inspectors would be satisfied.

Language continues to be an issue, both in the SMS and on board generally. Passenger ships, unsurprisingly, have the most difficulty in ensuring that there is a common language. While the ship may be able to operate adequately under normal circumstances, when fire teams need to work together, lack of a common language causes major problems. Few companies have resolved this problem satisfactorily.

Navigation.

We hoped that navigation and bridge watchkeeping standards would have improved in the past few years but it seems to us that, perhaps related to the apparent reduced standards of training and the increased use of electronic systems, there continue to be weak areas.

Over-reliance on electronic charts and electronic position fixing has caused at least one casualty where we have been involved as well as various near misses. We have had a situation where the electronic chart system has failed and while the officer tries to re-boot the computer, a course alteration is missed and the ship goes aground. The fact that it was a hazardous inshore route at night, with only the officer on the bridge compounded the situation. Other incidents seen have involved errors on the GPS systems that fed the radar and a difference of more than half a mile between the two bridge GPS units. No one noticed while the ship navigated half a mile off the coast.

We have been concerned to witness totally autocratic masters working on ferries navigating around islands and through narrow channels – no one on the bridge carried out any monitoring of the position, the helm or engine movements and the master continued to operate at high speed within seven cables of the berth. We found the situation frightening. When we suggested that bridge team management could be improved, the company superintendents did not comprehend the term and considered it outrageous that any officer would monitor the master's actions. The situation when a pilot is on the bridge is similar; often the bridge "team" heaves a collective sigh of relief and pass the time of day while the pilot navigates – on a passenger ship too.

Generally the passage planning that we see could be much improved. It is extremely rare to see a useful and comprehensive passage plan and particularly rare for a passage plan to build in "abort points" or contingency plans or otherwise consider the hazards involved.

It is worth remembering that this may be happening on the bridges of the ships that have the watertight doors open, the machinery maintenance inadequate, the protective devices untested and the CO2 system inoperable.

Class and Flag.

While everyone may think that all these problems were found on ships classed with non IACS members and registered with disreputable flags, we find that really there is not much difference between them. It is only the out and out "rust buckets" that are with non IACS class societies or not classed at all, and are flagged perhaps in a country with no experience of ships. It seems that the confidence that was previously given to insurers by IACS class and reputable flags is no longer there.

How much are Class and Flag really involved with the human side of operations? The majority of minimum manning levels are disgracefully low. With respect to fatigue, records of rest hours may be checked but we find that the majority of these are falsified. Few flags require drills to be carried out when they carry out inspections. The Marshall Islands is a notable exception we know of and the UK flag, we are pleased to see, often include a drill in the ISM Code audit; they are also realistic with the inspector/ auditor choosing the scenario and those involved. By having a drill, so much can be seen about how the crew work together, how they are managed, how much they know about the equipment, does the equipment really work. If a suitable drill cannot be held, it is unlikely that the ship will operate well on a day to day basis.

With respect to the condition of ships, we know that, despite what efforts some Class societies and some Flags have expended, there is still inconsistency in the way surveys are carried out. We still do not understand how standards can be maintained if perhaps three renewal surveys are carried out by one surveyor in one day. Perhaps the class societies

have been put in the unenviable position of feeling that they must please too many parties; certainly they seem far more commercially minded than before.

Risk assessment.
All the items that I have referred to above have been identified by our surveyors using basic risk assessment techniques. Rather than just look at the condition, they have asked what are the risks involved. This will involve the crew and the management system, as well as the physical condition of the hull and machinery. To them, all these have been readily apparent and often, when we point them out to the crew, they become clear to them too. What we do not understand is why the crew, the superintendents, the safety officer, the Designated Person, the class surveyor, or the flag inspector did not see what we saw or asked the questions that we asked.

When we began risk assessment surveys, we simply described the situations that we found. More recently we have used the simple matrix as found in the Code of Safe Working Practices for Merchant Seamen to give a "risk factor". We think that this helps the owner and the insurer to see the extent of the problem and to prioritise the corrective actions. We also hope that the company may consider it a useful tool for future use.

	Slightly Harmful 1	Harmful 2	Very Harmful 3
Highly Unlikely 1	Trivial Risk 1	Tolerable Risk 2	Moderate Risk 3
Unlikely 2	Tolerable Risk 2	Moderate Risk 4	Substantial Risk 6
Likely 3	Moderate Risk 3	Substantial Risk 6	Intolerable Risk 9

We see no reason why the practical risk assessment approach cannot be used more in the industry. It may not be perfect but it is simple and far removed from the complex solutions that are suggested elsewhere.

Back to basics – keep it simple (and safe).

Jon Gray
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