Bridge Team Management
The Next Generation from the Airline Perspective

1. Introduction

As we approach the end of the second decade of Bridge Resource or Team Management in shipping, we would be well advised to verify our current position. Much has changed within the industry since the early 1990s but the BRM concept has remained, more or less, in its original form. It has failed to evolve to meet the human challenges and it has, in my view, set off along a dangerous path.

Although originally based upon the airline world's Cockpit, then later, Crew Resource Management, it has never been taught in the same way and has taken on a "poor relation" character of its own. The most provocative question that has to be posed seriously at this juncture is, "What is the true motivation for BRM training within the shipping industry? Is it being carried out in order to satisfy a minimum requirement of a Charterer or are we serious about adopting the philosophy of "Best Practice" and raising our standards of safety? If the latter is the case, then BRM, as it is currently being taught, will continue to be no more than of minimal value with the risk that the concept will soon be deemed unfortunately to have failed.

My reasons for stating this are twofold.

Firstly, the constellation of the average ship's crew has changed radically in both culture and in size since the early '90s but the basic BRM syllabus addresses primarily a Western culture and Western attitudes.

Secondly, without the opportunity of practising newly-acquired human factors knowledge, all that the Officers will learn is what to do, not how to do it. You do not hone interpersonal skills interacting with a computer screen via a series of mouse clicks. If you wish to improve these skills, then the participants must be placed in an interpersonal environment - and that means a full mission simulator with a full bridge crew.

The over-riding philosophy here dates back to Aristotle .....

"To learn to play the flute, you have to play the flute."

In all complex industries where over 70% of incidents arise from human failure - aviation, healthcare, marine, nuclear power - approximately 60% of those errors emanate from poor communication techniques, methods and strategies. We seldom discover weaknesses in the crews' or teams' technical skills but their standards of communication can at times be termed as "high risk".

I should like to offer you some actual practical examples of the short-comings of BRM-qualified Officers observed during simulator training programmes.

2. BTM Communication – the Sharing of Mental Models

The first impression one obtains of a normal crew on the Bridge is a chronic lack of communication flow between them. It is not natural for them to talk to each other about operational matters, to comment, to question, to consult nor to seek additional information. They will simply stand there harbouring their uncertainties, their fears and their misconceptions - after all, consulting a colleague risks losing face, it risks enabling the colleague to show that he/she knows something that I do not - better just to keep quiet. This behavioural trait, as has been demonstrated to great cost on countless occasions, is lethal. By remaining silent, they are in effect consigning the ship to a single crewmember operation - a status for which the costly vessel, with its often equally valuable cargo, was not designed. The result is a plethora of "single points of failure" in the navigational system. The system lacks error tolerance.

Inhibitions, fears, cultural factors, call them what you will. Simply stated, this is not team performance and the BRM certificate that they all hold is doing nothing to aid their company's operational safety.

The increasing dominance of Asian cultures aboard the current day merchant fleet is further exacerbating this problem. There has always been, amongst Western cultures, a degree of fear added to the natural respect for someone of a higher rank but the Asian cultures add a mix of fear, pride and entrenched tradition to this dangerous cocktail. This can become so rigid that it can lead to a paralysis in bridge operations. The current course syllabi fail to address this matter adequately. It is extremely difficult to portray but, by some means we have to be able to instil into these young Asian officers that somehow they have to leave their national culture on the dockside.

Again, there is a parallel here in aviation. With the collapse of the Soviet Union 20 years ago, the Eastern European countries started to purchase modern Western aircraft that were designed for a two pilot operation. This contrasted greatly with the older Russian aircraft with 3-5 crewmembers. The Boeing 737 and Airbus A320 had been designed for a two-crew operation and that meant enhancing the responsibilities of the junior pilot. Without this change in status, we were risking a single-crew, in other words, untenable situation.

While one can develop bad habits, one can also be trained in a manner that will cultivate good habits and the full mission simulator is the ideal environment in which to build these skills and establish this behaviour.

To compare this with Flight Deck operations, there is no way that a pilot would alter the aircraft's course or altitude without either first consulting the other pilot or, at the very latest, telling him of the action while it is being carried out.

3. Situational Awareness

This worrying lack of open communication between team colleagues degrades their combined situational awareness - even modern navigational systems communicate with each other hundreds of times a minute for no other purpose than to update each other on progress and inform the other if one, for whatever reason, starts to deviate from course. Without this "cross-talk", as it is known, we are left with two or three independent systems and the autopilot will not know

which system or calculated course to follow. The exact same situation exists between the human crewmembers. Is this how the modern, technically sophisticated ship was designed to be operated? I, and I'm sure we, think not.

It is precisely because of the rapid increase in automation and integrated bridge systems that the need for this sharing of mental models has become crucial. Precisely as it was on the flight deck in the 1980s with the advent of the so-called "Glass Cockpits", the new human failings such as loss of situational awareness, mode confusion, target fascination and many others, entered our lexicon and led to new forms of incidents and accidents. The engineers' concept at that time of designing out human error was proving to be a complete fallacy; whereas many error-prone operations were successfully automated, the new, highly integrated systems demanded ever higher levels of system knowledge while, at the same time, opened up many sources of entirely new human errors. We paid the price and that price depended upon:

1. the age of the pilots and
2. the quality of the training - the level of investment!

Our CRM entered its 2nd and 3rd generations during this period as we struggled to address all these new issues. The pilots were losing the overview of what the systems were doing as they had no knowledge as to how they had been designed, programmed or interlinked by some "techno-guru" with no flying experience, in the sterility of a research institute. Former independent, mechanical systems were now linked to other totally unrelated systems as the word "INTEGRATION" started to take on an entirely new meaning. For example, why should the fuel controls affect the steering of the aircraft while on ground? Why should the flight control system be linked to the fuel transfer system? But they were.

And so it is now with the Integrated Bridge. We can fail a gyro and the OOW thinks he has a radar problem. While he stands there and thinks to himself - "I think there may be something wrong", his ship can swing 45°, 60°, 100°+ off course. If he comes up with another idea it may be that he has a steering failure but if in a close-quarters situation in restricted visibility, it may already be too late for him to take bold corrective action.

Let us add another deadly constituent to this mix, namely the young inexperienced Officer's inherent total belief that everything that appears on a screen is the TRUTH! How often have I seen a crew of three trouble-shoot without ever taking one reference from outside the windows? They need to be taught that "reality" is outside but no BRM syllabus that I know emphasises this point with adequate force.

It is essential to create such scenarios in the simulator in order to transfer this vital knowledge to the officers' long-term memory. You may be surprised at the power of emotions that can be created in a full mission simulator in real time. They can be so impressive that the experience will be taken back to the ship and will, with time, become indistinguishable from the experience gained at sea.

4. The Role of VHF

Another phrase or misnomer that is creeping into casualty investigation reports is that of the "VHF caused" or "VHF assisted collision". The reaction of the industry in general to this - including the salvoes aimed in my direction when I have spoken on the subject - is that VHF is to blame; we have Colregs therefore we do not avoid collisions with VHF.

In this distinguished company this evening, I am willing to stick my neck out again and face the consequences.

VHF does not assist nor cause collisions. If it did, we would have aircraft falling out of the sky every minute. The cause of the collisions in the majority of cases where VHF has been in use prior to impact has been systemic human error; error on the part of the crews who have received at the very best minimal training in VHF communication and error on the part of the industry for assuming that anyone can use VHF correctly. Many crewmembers do not even know how to speak into a microphone. Most critical of all is the total absence of structured VHF communication procedures or information highlighting the benefits and the dangers, the dos and don'ts of the system.

This is all the more regrettable considering the massive investment into the development and production of AIS to simplify ship identification and provide additional navigational data. There are also widespread reports that VHF is being abused in certain regions of the world such as the Persian Gulf. This latter fact is crying out for unequivocal IMO/PSC intervention.

It goes without saying that the concepts of "readback" and "hearback" are also absent from the average BRM course. It is essential that attitudes change towards this system as VHF is going to graduate from being a secondary navigational aid to a primary aid in the near future. Traffic densities and the increasing scope of new VTS systems will necessitate this. Additionally, Colregs are only valid if adhered to by 100% of marine traffic.

Professional discipline, a thorough familiarity with procedures and a sound knowledge of the English language will become paramount. The next time you read those phrases, "VHF caused" or "VHF assisted collision", say to yourselves quietly, yet another case of System Failure.

5. Leadership

When a senior officer undergoes training for his Master's Certificate, I should like to pose another couple of questions:

- Has he undergone psychometric testing beforehand in his marine career in order to ascertain whether he possesses the necessary attributes to lead a team and exercise the responsibilities of command?
- How much time and money has been invested in his training to instruct and practise his/her leadership and decision-making skills?

We are often confronted here with the dilemma that the Chief Mate or Master knows what to do but they are uncertain as to *how* to do what is required of them. They know that they are responsible for setting the style of leadership and

establishing the authority gradient or hierarchy on board but are uncertain as to how this is accomplished in practice.

This uncertainty extends to managing challenging operations, how and when to seek the input of others and how to structure their decision-making process. The main reason for these weaknesses lies not in their character make-up but more in the basic fact that they have received no leadership training or have gained very little experience. This is not the sort of training that can be carried out on board as no-one in their right mind would put their ship and cargo at risk so, once again, the full mission simulator is the best, the cheapest and the most effective training ground for demonstrating and practising correct behaviour under pressure and in real time.

Here, I am also speaking from my experience as an airline captain who was privileged to have worked for an airline that trained to achieve "best practice" - training costs were seen as an investment. I was blessed or cursed to have had a number of heavy emergencies thrown at me during my career with Swissair. On each occasion, we were congratulated on the successful outcome but, as much as I hated the hours spent in simulators, I must be totally honest and ascribe the calm operation, the clear thinking, the instinctively correct decision-making to those hours of practice, of drill, of feedback from instructors - and that comforting feeling of knowing that - I had "been there before".

These are the tools every ship's Master requires if he is going to carry out his/her duties at sea competently and with assured success.

My final concern relates to a topic that has been the subject of many articles recently originating most notably from P&I Clubs, organisations such as Intertanko and the Nautical Institute - the subject of .....

6. Pilot on Board

This sudden change in the Bridge Team balance - the moment a Pilot comes aboard - has been the source of numerous problems in recent years. It must be

accepted that there is a distinct shift in the "centre of gravity" of the team at this moment and, again, there are parallels in other industries - in aviation when a Check Captain is on the flight deck or two captains are flying together; with Healthcare in the operating theatre with the surgeon and the anaesthetist.

BRM training, if effective, should be able to handle this normal procedure if the correct company operating procedures are in place and the crew has had practical training in employing those procedures. I recently spent two days observing the work of the Liverpool Pilots on the Mersey and it was a most enlightening experience to witness the problems from the water looking up as opposed to the Bridge looking down.

The October 2009 edition of the Nautical Institute's "Seaways" magazine contains a very well written article on the decline of crew competencies from the Pilot's perspective - by Capt. Malcolm Goodfellow, a senior marine pilot from Newcastle in Australia.

Just to quote one of his statements: *"Good BRM principles would tell us that the marine pilot's role is supposed to supplement and increase the bridge team by one; however, what we see nearly every day is that in many instances, the pilot's presence on the bridge* ***reduces*** *the effective bridge team to one: the pilot himself."*

Effective team leadership by the Master, practised communication strategies, detailed passage planning and well-honed team skills are the solutions to this identified weakness. However, they are of little use gathering dust in operations manuals, they must be trained and practised - as a team.

7. Conclusion

This summary from an industry outsider may initially risk sounding arrogant, critical and interminably negative. If this is the case, then I humbly submit my

apologies. However, the marine industry has often stated its desire to learn from the airline world.

Well, we have been along exactly the same path with a string of failures on our record but also a few outstanding successes to our name. As I speak this evening, it saddens me to say that the airline industry is slipping back slowly towards the bad days and it will tragically take a few high-profile accidents to kick the industry out of its lethargy and into realising that the cost cutting has gone far enough. When the travelling public feels it is normal to pay more for the airport car park than the airline ticket to - say - Miami, then the airline industry is indeed in serious trouble.

Safety management is change management and that means that both the marine and airline industries have to face up to a change in practices. In both industries this will mean an increase in investment in training.

However, on a positive note, the majority of the problems within the marine industry have been identified and can be easily - yes, easily rectified. All that is required now is the will, the determination and the investment.

An investment in non-technical skills training is precisely that; it is an investment, it is not a cost. It is an investment in and an insurance to protect future earnings - it is, to quote a large Swiss bank, "wealth protection". After all, no company budgets for an accident, the cost comes directly out of net profit.

Many of the airlines' more successful Non-Technical Skills training methods may be adapted effectively to the marine environment and I can assure you that the results will be equally impressive.

BRM or MRM requires a radical overhaul both in content and didactic methodology. Ship designers can go a long way to engineering out much human error but first the legislators need to agree on certain industry standards - that is a subject for another time.

In the meantime, I call on everyone not to shy away from investing in quality, practical training - there really is no alternative.

If >70% of all incidents and accidents are truly being caused by human error, then it stands to reason that a similar percentage of the training budget ought to be directed towards improving the crews' non-technical or human factor skills.

I shall close with a worn out but still valid aviation safety saying .....

"Safety costs money but if you think that is expensive, try an accident!"

Please bear in mind that we humans create safety - without us, there is none; let us ensure that the crews have all those necessary human factors skills at their disposal to maximise the next decade's levels of operational safety.

"Learning is essential to keeping ahead of the constantly changing nature of Risk" - ***Sidney Dekker***

Thank you .....