Use of Checklists Onboard Ships



THE HONOURABLE COMPANY OF MASTER MARINERS

Published 16th March 2023

Introduction

The maritime industry takes much from the airline industry in terms of operational parameters. Crew Resource Management came across to the maritime sector as Bridge Resource Management (BRM). The idea behind this was that the traditional hierarchical structure of bridge teams is replaced by a more functional and cohesive team, where team members feel encouraged to speak up, air their opinions and question orders given, drastically improving maritime safety.

Checklists are an essential tool for the aviation industry and have now also come over to the maritime industry. Many companies' SMS procedures require the use of various checklists in order to complete operations. From pre-arrival and pre-departure checklists, to pilot briefing checklists, emergency action checklists and watch handover checklists, there are a plethora of these documents used by companies. These checklists are not confined to the bridge and engine control rooms, many permits to work operate a checklist format, where many different safety requirements must be completed before a task can begin.

The aim of this paper is to encourage discussion, requiring the reader to ask themselves the following questions:

- Is the reader comfortable and experienced with checklists?
- Is the way in which the reader has been trained to use checklists adequate, if indeed any specific training has been given?
- Does the reader think there is a particular technique to using checklists that the reader particularly likes?
- Is there a difference in the way the reader uses checklists in normal operations vs emergency situations and if not, does the reader think having a different approach would be useful?

Historically, the aviation industry seems to have a better safety record than maritime. But why is this? The maritime industry is globally much larger, and seems to have more problems. Is it training, better equipment or procedures that make the aviation industry safer? It is probably a mixture of these things. This paper, however, focuses purely on checklists, and the techniques and use thereof.

Checklists in Normal Operations

During normal operations, checklists form an invaluable part of a ship's Safety Management System or SMS. In recent years, checklists have become more and more prevalent. From the perspective of a ship's bridge, checklists detailing arrival and departure checks, watch handovers, pilot exchanges, briefing memos, etc. have become a staple in daily life. But are they actually useful?

The HERALD OF FREE ENTERPRISE incident was the maritime disaster that prompted ISM. However, we could ask ourselves the question, what if there had been a pre-departure checklist that included the requirement for the officer of the watch to ensure the bow doors were closed? Would the disaster have been averted as someone would have had to physically tick a box prompting them to check. On the other side of the argument, if checklists are too long, are people prone to checklist fatigue and simply tick the box because the doors are always closed; therefore, in their mind, there is no requirement to check?

Certainly, throughout the years, checklists have evolved and lengthened. Watch takeover checklists in particular. Some officers state that they hate the checklist, because you simply end up repeating what you've been told parrot fashion, and particularly early in the morning, they have taken the watch, sat down and must check elements of the take-over because they can't remember what they were told and repeated back five minutes ago. Is getting rid of takeover checklists and relying purely on the officer's professional judgement to look at what they feel they need to know to take over the answer? It is a question that is difficult to answer.

Large companies now have a multitude of checklists covering all different elements of shipboard life. On the bridge of a modern-day passenger vessel, it is not uncommon to have over forty checklists. This can create a problem audit-wise for ships. Ensuring all checklists are constantly updated to the latest specification from the company can be difficult. People working in the office regularly make updates according to what they feel these checklists should involve, often to the annoyance of officers onboard ships, which creates a paper exercise often thought of as unnecessarily complicated.

With that said, the use of checklists can help ensure that a certain standard across a fleet is maintained. To the best of their ability, the parent company is setting a minimum standard for information to be exchanged and certain tasks completed in a certain way on a normal operational basis. This is believed to be a generally positive thing.

Checklists in Emergency Situations

A fact of life at sea is that, at some point, all of us will experience an emergency situation. Mariners become well versed in responding. Many reading this paper will be familiar with the rush of adrenaline felt when things start to go awry. When the first alarm sounds and you confirm it is reality, things start to happen quicker and quicker and your time to think is reduced. A term often used in the emergency services is 'red mist'. This specifically relates to driving under 'blue light conditions' and applies particularly to volunteer emergency services such as coastguard rescue teams, RNLI, mountain rescue and rural volunteer fire and rescue services, who often are woken in the middle of the night and have to drive to the scene of incidents under 'blue lights'. As they drive in a just woken state, sirens blaring and lights flashing, whilst operating a radio and thinking about the scene of the incident they are about to attend, 'red mist' can close in, distracting them from the critical task of driving and subsequently causing accidents. Of course, checklists will not help in this case, but it simply shows how the mind can become overwhelmed during emergencies. Emergency checklists on

ships are designed to help mitigate that 'red mist' and assist the operator in completing the steps necessary to deal with the problem.

Using emergency checklists in the right way is critical to the outcome of an emergency. Yet as BRM develops, particularly in the passenger ship industry, we are seeing specific ways of using checklists. These techniques often seem in contrast with the aviation industry, which makes it all the more interesting to look at.

Airlines generally use what is called a 'QRH' or 'Quick Reaction Handbook' to deal with emergencies. This is probably best demonstrated in the movie 'Sully', which gives the VDR equivalent account of what happened in the cockpit that day when Flight Cactus 1549 successfully landed on the Hudson River, with zero fatalities. The use of 'Miracle on the Hudson' is an example because the emergency demonstrated two particularly interesting nuances regarding checklist usage. Mere seconds after the bird strike, the captain turned on the APU, allowing the pilots to have basic aeronautical instrumentation as well as cabin lights, PA system and radios. This step was far down in the checklist, and the captain turning on the APU represented a significant departure from the checklists. After taking charge of flying the aircraft, the co-pilot began working through the checklist. Several steps such as sending a 'mayday' had already been done before he pulled the checklist out, but many steps were not. The checklist guided the pilots, and although ultimately unsuccessful at helping them restart critically damaged engines, did the checklist help them to execute a successful ditching? It is also worth noting the NTSBs observation that the engine failure checklist was designed for cruising altitudes and not for immediately after takeoff. In that case, could the checklist have made it more unlikely for such a positive outcome? Certainly, a question to consider.

Why is this specific example used, especially in a paper designed for the maritime industry? As previously stated, passenger ship companies in particular are giving specialist training to their officers in the use of checklists, specifically focused on a 'do and read, read and do' technique. This training requires the checklists to be broken up into two distinct parts, with the user required to memories the first part, known as 'initial actions'. The thinking behind this is to induce a quicker reaction time in emergencies. Officers are already highly trained, and when faced with an emergency, will react quickly by automatically completing the most important initial actions without any prompting. After that, another person can go through the checklist and ensure those initial actions have indeed been completed. After that, the team, as there is generally a two-person watchkeeping team on passenger ships, completes the 'read – do' section step by step, going through the checklist until all required actions to deal with the emergency have been completed. This is a quick and effective way of using checklists. It uses a combination of user training and the officers' experience, without overreliance on the checklist itself, in essence it meets checklist usage versus pure experience in the middle.

An argument often made is that checklists in an emergency can cause skill fade, overreliance on a checklist walking you through each action required in emergencies diminishes the need for such professional training. In an argument once overheard, an officer said, *"why not just put stewards up here if the checklist is going to tell me what buttons to press in which order to solve the problem, there's no need for 3 years training to do that!"* Does overreliance on checklists during emergencies

cause a certain amount of skill fade? In general terms no, however, there must be a fine balance between using a checklist exclusively, at the cost of actual professional analysation. Years of experience at sea dealing with emergencies is invaluable to an emergency being handled correctly.

Conclusions

In this short paper, there are probably more questions than answers, but the purpose is to spark a debate whether checklists, whilst generally accepted as useful, are becoming too cumbersome?

In emergencies do checklists help an officer respond effectively? There is an argument that, yes, checklists do help. However, the argument made by fellow officers that they feel over reliant on checklists, and that their professional judgement is somewhat hindered because they feel 'slaves to the checklist' is understood.

In the introduction to this paper, the reader was requested to ask themselves four questions;

- Is the reader comfortable and experienced with checklists?
- Is the way in which the reader has been trained to use checklists adequate, if indeed any specific training has been given?
- Does the reader think there is a particular technique to using checklists that the reader particularly likes?
- Is there a difference in the way the reader uses checklists in normal operations vs emergency situations and if not, does the reader think having a different approach would be useful?

However, it is hoped the reader now perhaps has several more. Ultimately, many others who have debated the issue have accepted that checklists are here to stay, and that is no bad thing. It is believed, however, that in many large companies the process for updating and writing checklists could be improved. A takeover watch checklist is useful, but do we really need a checklist which marks out the steps for conducting a debrief? The art of debriefing and motivating a team to speak up should be covered in leadership training, and therefore unnecessary; however, we know that leadership training in the Merchant Navy is woefully inadequate. Perhaps the final question we should ask ourselves is, if training standards were improved within the industry, would the need for such checklists be diminished.