
How Safe are Today's Tugs?

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SYNOPSIS

This paper examines safety on board tugs and looks at the different categories of tug in an attempt to answer the subject question. The concept of safety will be addressed and the assessment of risk, through the ALARP (as low as reasonably practicable) principle, used to rate tug safety.

Some tug categories have been separated to compare the risks encountered by harbour tug and salvage tugs. The paper looks at tug safety from a P&I Club perspective and at the issue of reduced crewing addressed from a safety aspect. Four recent tug casualties are discussed briefly in an effort to demonstrate the overall picture is one where tugs can be considered safe.

INTRODUCTION

My first memory of tugs goes back to 1951/1952 when the saga of *Flying Enterprise* and *Turmoil* hit the UK headlines. The tale has been told many times and images viewed of the severely listing *Flying Enterprise* and the heroics of *Turmoil*, where Ken Dancy leapt from it on to the *Flying Enterprise* with a heaving line attached to him that enabled the towline to be hauled over and attached to the stricken ship.

Pictures abound showing the tug and tow struggling and the classic picture, showing the master, Kurt Carlsen and Ken Dancy crouched on the funnel ready to leap to safety, truly evokes the image of salvage heroics. This was an epic occurrence and enough to spark my lifetime interest in tugs and salvage.

The term 'tug' has now become generic in that it is used to describe all manner of vessels that undertake tows. The basic risks that tugs are exposed to remain fundamentally the same, whatever the design. Tugs are required to place themselves in very close proximity to moving objects such as ships and oil installations. The 'advanced' risks tugs must take involve approaching casualties that may be afire, listing or otherwise exposed to danger. The question this paper asks is simple enough – how safe are today's tugs?

WHAT IS SAFETY?

There is no simple, one-line definition illustrating what is meant by 'safety'. Involved parties look at safety from different perspectives. The most obvious area where safety is paramount is the protection of life, and some might suggest that is as far as any definition should go.

Risk analysis will define a safe operation as one where the risk to life, limb and property is as low as reasonably practical, known as the ALARP principle. Judging by some of the health and safety edicts currently circulating, something is only 'safe' when there

is *no* risk to an individual. School children in the UK have been prevented from playing on snow-covered or icy playgrounds because it is too dangerous – which is not sound preparation for real life.

Using the ALARP principle when examining situations where safety is an issue does at least offer an opportunity for sensible consideration of the risks involved. The end result is that there is no guarantee of safety in all circumstances, but the awareness of the risks, at least by those undertaking the risk assessments, goes some way to contributing to the ALARP judgement.

Pragmatically, a safe operation might be considered as one where nothing of note occurs that may prompt a response or report. This approach may be too simplistic in that some incidents occur that are not reported, for whatever reason. Just because a report is not required, does not mean an operation was safe. Near-miss reports, such as those encouraged by the Nautical Institute MARS scheme, show how the safety of a situation need not be judged by injury or twisted metal.

The paper that follows looks at safety from the different perspectives of those closely involved in tug operations.

THE TUG OPERATOR

The harbour tug operator places his craft, when underway, in immediate proximity of sometimes very large moving ships. Heavy tow lines are passed and often crew members must work close to lines under tension. Sometimes a minor misjudgement can result in death, maiming or other serious injury.

No tug operator likes to deal with the consequences of an accident. If a vessel is damaged, crew member killed or injured or there is another type of incident, the tug owner or operator will face a barrage of questions

from many sources such as the underwriters, state accident investigators, other involved authorities and commercial interests. This onslaught of outside attention is hugely time consuming and expensive. A safe operation could be considered as one where no 'additional' work is generated through the operation of the vessel.

THE SALVOR

Many salvage companies are also tug owners, but nowadays there are very few private stationed tugs dedicated to solely salvage operations. This means that, when called upon to undertake or become involved with salvage operations, the owners may have to place additional crew with experience in salvage operations on board a responding tug.

Where a straightforward tow is required, a salvage operation may be just marginally more difficult than a regular ocean tow. However when a casualty is on fire, listing heavily or spilling oil, the response requirement changes significantly. To achieve the objective, the salvor must place craft and crew involved into a significantly riskier situation than normal operations accept. The ALARP principle should still apply – it is just the parameters that change. The tugs themselves are no less safe than before and the circumstances in which they operate can be much more hazardous.

No salvage or tug master will put himself, his crew or tug into reckless danger, but there is always the risk of the unexpected, just as the responding tugs found out when *Stora Korsnas Link 1* suffered an unexpected sodium chlorate explosion off Redcar, on the north east coast of England a few years ago.

I suggest that although the hazards are greater when a tug is undertaking salvage, the tug itself is as safe as it ever was.

THE P&I CLUB VIEW

When a vessel is exposed to salvage operations the underwriting risk changes and several P&I Clubs offer a tailor made 'salvors risk' cover; a specialist area within P&I insurance.

I was fortunate enough, when working at the Shipowners' P&I Club in 2009, to be offered access to the summary information of some tug claims that had been submitted between February 2004 and March 2008. I am pleased to thank Charles Hume for this access as it has allowed me an opportunity to answer the title question from a position of some vicarious knowledge. For obvious reasons confidentiality has remained intact and the information I have been able to use was extremely broad in nature.

I have not conducted a detailed analysis of these claims, but I was able to see the categories of claim that gave rise to the greatest exposure. My impression is that the largest number of claims fell within the personal injury category. It was possible to determine this in the

broadest sense without detailed analysis. Accidents that resulted in personal injury range from the minor bumps and scrapes through to major trauma, for example when a crew member was hit by a parting wire. Given the need to operate tugs in such close proximity to large ships, often in adverse weather, the number of serious claims is few. This is, again, my overall impression, rather than a result of detailed numerical analysis.

Many accidents are avoidable and even a broad reading of the underlying causes clearly points to the 'human error' factor. Tug crews are exposed to circumstances daily that deep sea crews might meet only four or five times a year.

Most of the expensive claims were invariably the result of collisions or allisions (where a moving vessel hits a stationary object). It is not really surprising that a relatively large number of claims arose from tugs coming into contact with their tows (or vice versa), bumping into bridges, or hitting offshore platforms. My own view is that very few claims are attributable solely to the fact that the vessel involved was a tug.

I would like to put tug safety, from a P&I point of view, into some sort of perspective. The previous paragraphs have highlighted the overall claim situation in just one P&I Club, which has about 4,500 tugs entered. In a four year period, some 2,430 tug claims were registered. When looking at the numbers, due consideration should be given to the type of close-quarters work undertaken and the daily operations carried out by tugs. The total of 0.14 claims per tug per year is, in my opinion, a remarkable safety record.

That is not to invite complacency. I am aware that there are some tug operators who need reminding of their poor record and sometimes slipshod approach to safety. The Loss Prevention Department at Shipowners' takes the safe operation of tugs very much to heart and offers sound advice to members, based on years of tug claim experience.

During my deployment, I was asked to look at some of the major tug and offshore craft incidents where the resulting claim amounts had been truly eye-watering. Some of the vessels involved were tugs, and others were offshore supply type vessels. In only one instance could the result of the casualty be attributed to the fact that the vessel was, or had been, a tug. However, closer examination showed that the crew were not familiar with the compartmental layout of the vessel. Overall the cause of most incidents was mistakes by crew on the bridge or in the engine room.

HEADLINE CASES

A paper on tug safety would not be complete without mentioning the few cases that have occupied the headlines. Invariably incidents attract the attention of the non-shipping media when there is loss of life. Worse still when there is a tragic family element involved as with *Bourbon Dolphin*. The outline facts of that incident are well documented and several issues were highlighted by the post incident investigations, including

design, stability and weight distribution arising from poor supervision during building. With hindsight it is easy to conclude that this incident was totally avoidable, but let us hope that the lessons arising from it are truly learned.

The *Flying Phantom* incident on the river Clyde in December 2007 was no less tragic and again highlighted the potential frailty of tugs when operating in confined waters when connected. It seems that the tug may have grounded and her charge did not realise what had happened in the fog and she continued her forward movement, thus 'girting' the tug.

The *Ijsselstroom* incident in 2009 may not be familiar to delegates, possibly because all on board were rescued. My understanding of events is that while acting as stern tug in a barge tow into Peterhead, she came broadside on to the direction of travel and girted, sinking very quickly.

Finally, the *Ocean Link* incident off Singapore in early January 2010 occurred with a loss of at least 13 crew. At the time of writing this paper there was little readily available information regarding causation.

I felt it was important to mention these four cases, if for no other reason than to show that incidents still happen and lives are still lost both at sea and in the confines of a river in a populated area.

REDUCED CREWING

A few years ago I undertook a study of tug operations at five locations all roughly at the same latitude. Manning levels on tugs in these ports was a fundamental issue. I was given free access to all the crews and their work schedules. In summary, crewing levels varied from the three-man crew, working alternately, ie two crews of three men per tug, to a five-crew tug with three crews per tug. All the tugs were carrying out the same basic operation, assisting tankers to and from a berth. I believe there are tugs employed in port operations where there is a crew of two men.

In my experience, tug owners operating on what are perceived to be 'reduced' manning levels, do not encounter any greater incidence of incidents than the tugs manned by larger crews. The awareness of individual crew members of the safety culture on board was, if anything, greater on the tugs with smaller crews.

During my study I investigated the on-board safety record and found that the number of crew was not a factor in accident causation. The tugs with the small crews were manned by dedicated staff with a sense of safety and looking after the job.

CREW TRAINING

The maxim that most accidents are the result of human action or inaction appears to be as true with tugs as it is with other classes of vessel or ship. Even when salvage tugs are exposed to a higher degree of risk, the accident record is remarkably good. I believe there are two major factors involved. Firstly, there is a greater awareness by the salvage crews that they are working in a hazardous environment, therefore they are more alert and less likely to make mistakes. Secondly, there is the comparatively high level of training salvage crews undergo. Interestingly, many modern salvage masters are former tug masters. This experience gives the tug master turned salvage master an excellent background when using tugs during salvage operations.

Having visited the salvage equipment depots of many salvage companies, it is clear to see where the training ethos has developed. Salvage crew members, including tug crews, are given in-house training on the use of salvage and emergency equipment.

HOW SAFE ARE TODAY'S TUGS?

It is accepted throughout the maritime industries that accidents will continue to occur. The records show that most incidents are the result of a chain of events some of which relate to design or poor build quality. However, the records also show that the human element still forms a significant factor in accident causation – not all the 'human element' stems from inadequate training. I have seen at first hand situations where tug crews are asked to work long hours over a prolonged period: weeks and sometimes months.

Sadly, I have to conclude that a significant factor in some tug accidents is fatigue. Equally, it must be said that where crews are small, monitoring of working practices is greater and fatigue less of a problem and where tugs are deployed on salvage operations it is customary for additional crew to be placed on 'non-salvage' tugs to take into account the extra workload.

In conclusion, I would suggest that today's tugs have a very good safety record.

