

# Part 3 – Leisure Craft



Analysis of an accident always relates to the actions of people. Without training or experience they may have had little idea of what they were doing. They may have been well trained in theory but had little practical experience. They may have had great practical experience but little formal training. Or they may have been simply human, and despite good training and experience, done the wrong things anyway.

Thorough *training* includes theoretical and practical work. A defined framework equips a student with a set of skills that in a seagoing context must include an expectation of having to “think outside the box”. In the UK, training courses designed by the RYA (Royal Yachting Association) do an excellent job in a wide variety of applications. Offshore sailors now also have an ISAF (International Sailing Federation) course, much of which follows the IMO STCW (International Maritime Organization Standards of Training, Certification and Watchkeeping) model. In other countries, the member national authorities of ISAF also promote courses. The quality and value of RYA courses is recognised by their application in countries as far apart as the USA and Australia, and the expansion of training in the leisure sector ensures that standards of competence are steadily improving.

*Experience* may mean that you have sailed thousands of miles over a given period. However, its value depends on the conditions encountered, the types of boat sailed, and the circumstances and problems dealt with. Without training, experience alone can leave you exposed. In the Hobart 98, for example, one highly experienced yachtsman with many Hobarts to his credit admitted that performing the tricky task of boarding a liferaft was something he had never ever done.

But, in leisure sailing, as in all seagoing, however well training and experience is combined, there are always gaps. And this is exactly where the MAIB Safety Digest scores heavily.

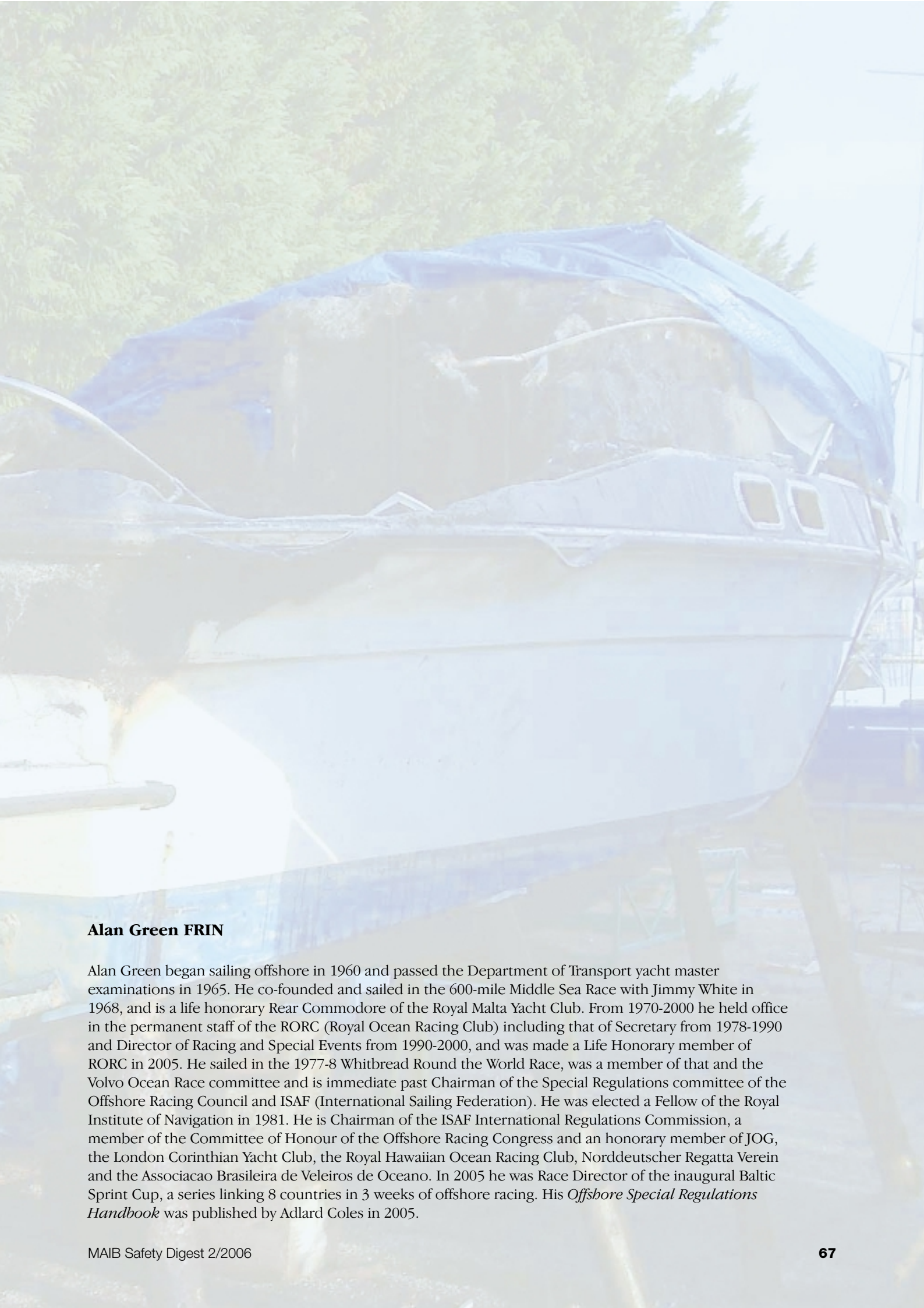
Here, distilled from thousands of hours of seafarers’ experience are real-life crises. Here we learn in simple, direct language how the problem was “set up”, how it developed, what the crew did about it, and what the results were. None of this is theory. In some incidents, people died or were injured. The reality of these cases is what gives them “bite” compared with imaginary scenarios invented in a classroom.

In my experience, presentations that command total attention are those given by real-life survivors. As they recount their experience in person their audience takes a deep, direct interest: “What would I have done?” “Would I have seen this coming?” “Have I ever behaved like this?” “How must I prepare, so this never happens to me?!” We get caught up in the drama. Lessons are learned almost as well as if the audience, too, had been there.

So it is with the Safety Digest. For this, MAIB, thank you.

*Aran Green*

25th May 2006



### **Alan Green FRIN**

Alan Green began sailing offshore in 1960 and passed the Department of Transport yacht master examinations in 1965. He co-founded and sailed in the 600-mile Middle Sea Race with Jimmy White in 1968, and is a life honorary Rear Commodore of the Royal Malta Yacht Club. From 1970-2000 he held office in the permanent staff of the RORC (Royal Ocean Racing Club) including that of Secretary from 1978-1990 and Director of Racing and Special Events from 1990-2000, and was made a Life Honorary member of RORC in 2005. He sailed in the 1977-8 Whitbread Round the World Race, was a member of that and the Volvo Ocean Race committee and is immediate past Chairman of the Special Regulations committee of the Offshore Racing Council and ISAF (International Sailing Federation). He was elected a Fellow of the Royal Institute of Navigation in 1981. He is Chairman of the ISAF International Regulations Commission, a member of the Committee of Honour of the Offshore Racing Congress and an honorary member of JOG, the London Corinthian Yacht Club, the Royal Hawaiian Ocean Racing Club, Norddeutscher Regatta Verein and the Associacao Brasileira de Veleiros de Oceano. In 2005 he was Race Director of the inaugural Baltic Sprint Cup, a series linking 8 countries in 3 weeks of offshore racing. His *Offshore Special Regulations Handbook* was published by Adlard Coles in 2005.

# Junior Powerboat Racing Accident Raises Safety Concerns



## Narrative

A 13 year old boy suffered a serious head injury during a national junior powerboat racing event. He had been the co-driver of one of 9 boats competing in a race for drivers aged 8 to 12. The field of boats was arriving at the first 90° turn marker, having completed a 400m long straight leg from the start line, when one boat *hooked* and effectively stopped dead in the water broadside on to the following boats. One of the following boats collided with it, and rode up and over the stationary boat, striking the young co-driver on the head and shoulder (Figure 1).

At some stage in the accident, the co-diver's safety helmet came off. It was later found in the water by one of the race safety boats: its chin strap was still done up. A paramedic, who had been stationed afloat on another safety boat, was quickly on scene to give vital first-aid treatment to the boy. The boy was transferred to the shore and then to hospital where he was found to be in a coma.

Junior offshore powerboat racing had been started 3 years earlier, with the intention of giving youngsters aged between 8 and 16 training and experience so that they could easily and safely transfer to compete in adult racing. In drawing up the rules of the new class, the organisers were aware that safety had to be paramount, but they had to juggle this requirement, to some extent, with the necessity to make the activity exciting and the need to mirror adult racing as far as possible. In forming the rules and introducing the new class, the organisers were monitored by the governing body for all offshore powerboat racing in the UK. The rules for the class were published in the governing body's annual powerboat racing handbook.

Prior to the first season, a commonly available 4.8m ski boat, with a 20hp outboard engine, was chosen as the standard boat for the class. The ski boat and engine combination had been trialled extensively by the organisers, who had concluded that it was responsive and handled positively and well. It was capable of attaining



Figure 1 – Following boat rides up over stationary boat

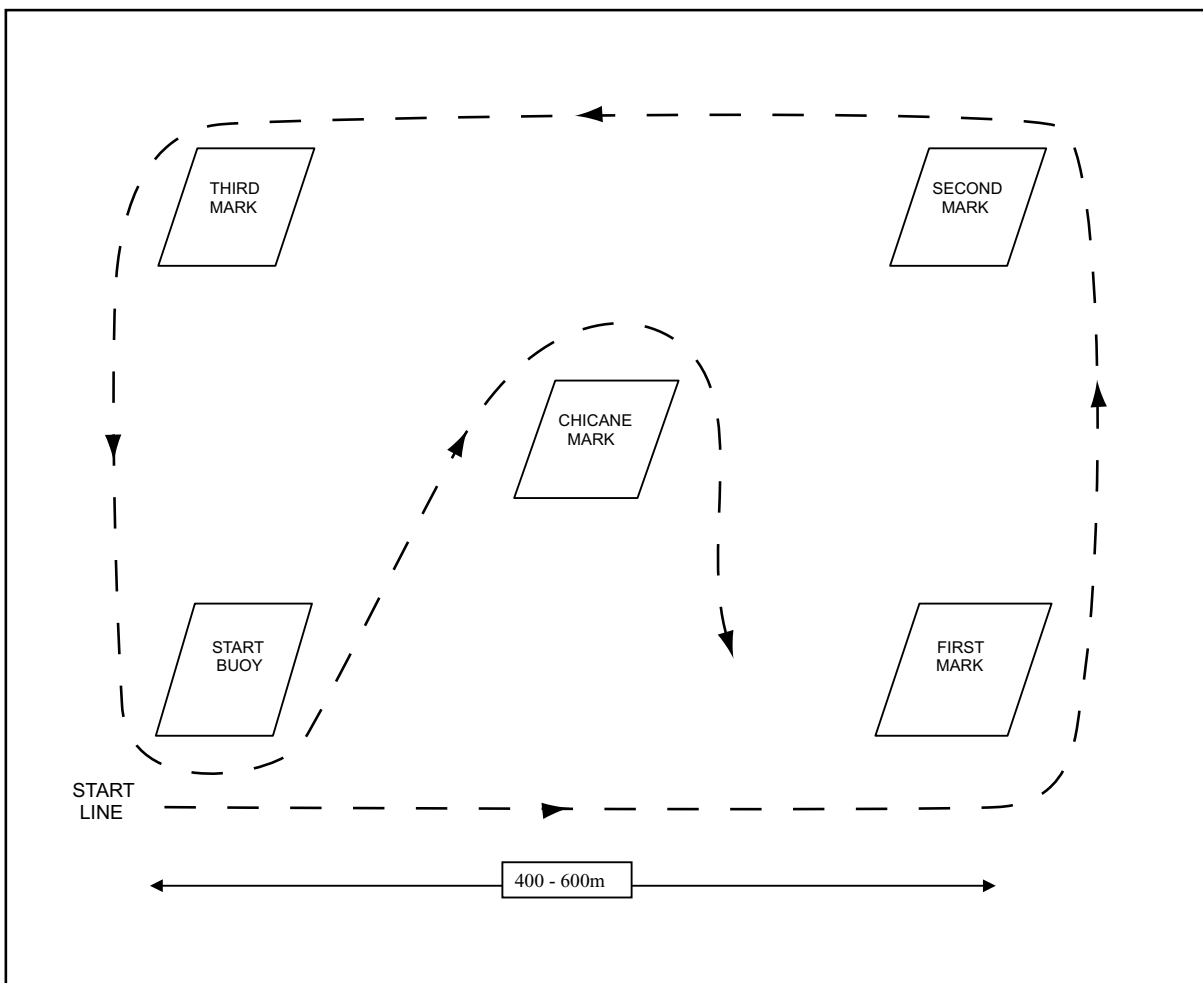


Figure 2 – Typical course

speeds of about 27mph in calm conditions. Consideration had also been given to the optimum standard race and course design for the new class. It was decided that head-to-head racing around a smaller, but similar, course to that used by adults, would best meet the objectives. The chosen course design was roughly rectangular, with a dog-leg in one of the longer sides (Figure 2).

Racing was designed to continue for about 10 minutes, before being brought to a finish.

The rules detailed the safety equipment and protective clothing requirements for all competitors. Among many other items, they each had to wear a crash helmet. There were no minimum training standards laid down, except that, in order to race, each competitor

had to have a licence issued by the governing body. The governing body only issued a licence when the class organisers were satisfied that the child was competent to race safely.

Prior to the first season, the would-be competitors underwent fairly extensive training both in the classroom and on the water. The training was provided by the class organisers and, at this early stage, overseen by the governing body. During the winter between the first and second season, new and existing competitors continued receiving training over many weekends. At this time, most new competitors had undergone at least 40 hours of supervised training before being issued with licences by the governing body. This high standard of initial training seemed to reduce prior to the third season, when the accident occurred. The 10 year old driver of the boat in which the injured boy was co-driver, had only undertaken 1 or 2 weekends of training before competing at the first race of the season. Both the 11 year old driver, and the 12 year old co-driver of the following boat, had each received only 1 weekend of training before being issued their licences.

For the third season, the size of the engine was increased to 25hp because the original choice of engine was no longer readily available in the UK. This had the effect of increasing the top speed to 30mph.

Throughout the inception and first years of junior powerboat racing, the organisers considered the safety of the children as their first priority. The practical organisation of the race days, the frequent safety briefings, and the resource and effort put in to monitoring the safety of the race events, was faultless. However, there were some shortfalls in other aspects of safety management. From the first

season, a number of minor accidents and incidents occurred which were not fully investigated, and lessons were not learned. The formal reporting of accidents by the class organisers fell short of requirements, and this was not noticed by the governing body.

One accident that did result in safety improvements occurred during the first season, when one boat collided with another that had stopped ahead of it at the first turn, in a very similar way to the accident in question. On that occasion, both the driver and co-driver were taken to hospital for a check-up; fortunately neither was seriously hurt. This accident highlighted the vulnerability of the driver and co-driver of the boat which was hit, and resulted in anti-intrusion bars being fitted to all boats to try and prevent injury in the event of one boat riding up over the stern of another. However, the detail of the design of the anti-intrusion bars, including their strength, was left to the boat owners (mainly parents), and the factors which had led to that accident were not put through a formal risk assessment process by either the organisers or the governing body. Had either done so, they might have realised that the combination of head-to-head racing, ski boats with low freeboard, a course design with all competitors arriving bunched at the first 90° turn, and young inexperienced drivers, provided too high a risk for the children's safety. Better still, these factors could have been used to inform a risk assessment when the rules for the new class were being considered.

It is not known whether the injured boy's helmet becoming dislodged during the accident contributed to, or indeed mitigated, the injuries he received. Despite rigorous analysis of video and witness evidence, it could not be established at what stage it had come

off. However, the investigation did discover that many of the children were wearing marine safety helmets that had only been tested for adult head sizes, and that there had never been a proper risk assessment to establish the

most suitable helmet type and strength for powerboat racing in general. As a result, the MAIB issued a Safety Bulletin which made recommendations to the governing body and powerboat racers on this subject.

## **The Lessons**

1. Both at the inception of the new class, and then after incidents and accidents, junior offshore powerboat racing lacked detached and objective oversight. More formal risk assessment processes should have been applied to the principal elements of the sport to ensure that it was fully safe. Following a formal process can and does uncover and highlight risks that otherwise may go undetected.

2. Accidents and incidents provide a valuable opportunity from which lessons can be learned for improved safety. Don't waste the opportunity by only paying lip service to accident and incident reporting: do it properly, it may save your or someone else's life.
3. All users of safety or crash helmets should ensure that their helmet is tested for their head size, is fit for purpose and is properly fitted and secured.

## Almost a 'Deadman's' Handle

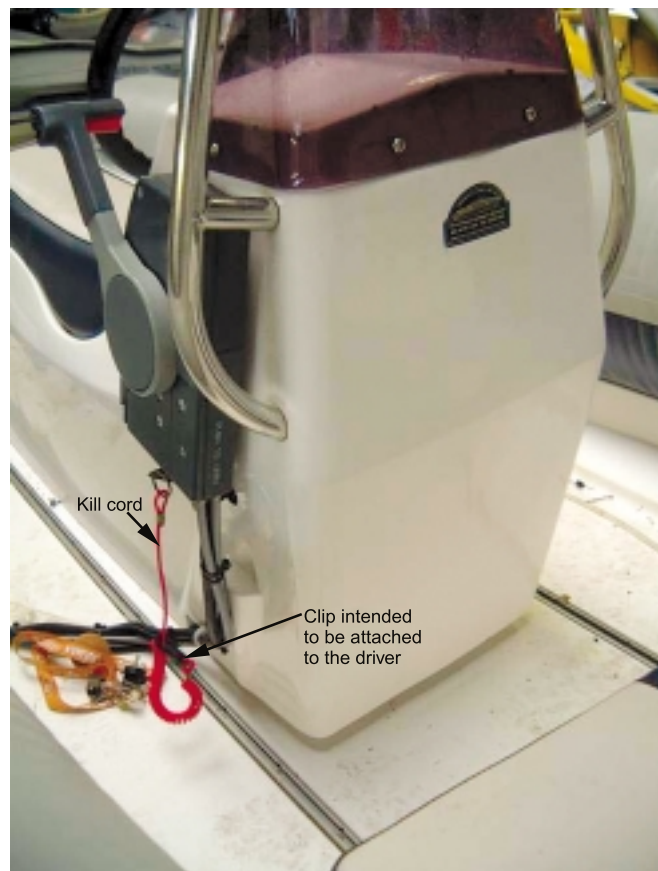


Figure 1 – Photograph showing console and kill cord

### Narrative

As a 4.5m RIB with three teenage occupants approached the beach to pick up a wakeboard, it passed a line of markers indicating the boat was entering an area in which a 4 knot speed limit applied. The driver reduced speed to about half throttle, and commenced a slow left-hand turn. During the turn, the console on which the driver was sitting, and to which the steering wheel was mounted, detached from the deck (Figure 1). The driver was unable to maintain his balance, and fell over the boat's port side and into the sea.

The RIB immediately turned sharply to starboard, and a passenger who had been sitting on the rubber tube to the driver's left was thrown into the water. He was immediately struck by the RIB's rotating propeller. A few seconds later, the remaining passenger panicked, and jumped out of the

boat, leaving the now unmanned RIB to circle in a clockwise direction, at a speed of between 10 knots and 15 knots. While circling, the RIB passed sufficiently close to the driver, who was assisting the injured passenger, for its propeller to rip his fleece top. None of the RIB's occupants were wearing buoyancy aids.

Fortunately, the accident was seen by another powerboat in the vicinity, which managed to pass a line to the people in the water and tow them clear. The injured passenger sustained deep lacerations to his chest and left side (Figures 2 and 3), and was taken to hospital by air ambulance. He remained hospitalised for 3 weeks. The RIB, escorted by a local lifeboat, circled for about 30 minutes until it finally beached in an area which had been cleared of many other, varied activities by local authority officials. The flares carried on board the RIB were found to be out of date.



Figures 2 and 3 – Injuries to passenger

## The Lessons

1. Had the kill-cord fitted to the RIB been used, the injuries caused by the propeller would have been avoided. A RIB driver does not expect to be thrown from his or her boat, and therefore it is not difficult to see why some drivers might see the wearing of kill-cords as unnecessary, or even as an insult to their ability. However, this accident shows that the unexpected does happen, and that people do get seriously injured as a consequence. It is common sense to use the kill-cord; it is foolish not to.
2. Although many boats' fittings and accessories might appear to be secure, this should not be taken for granted. Wear and vibration take their toll over time, and can result in catastrophic failure of some fastenings, particularly on high-speed craft. Periodic inspection of these items takes little time, and increases the probability of the detection of loose items in time to allow remedial action to be taken and potential accidents averted.
3. Speed limits are usually imposed for several reasons including the prevention of wake damage, and the reduction of the risk of collision in busy areas of diverse activities. Disregard for such limits is potentially dangerous, not only for the vessel in question, but also for the other water users in the same area, which includes swimmers, divers, and young children paddling, who are unable to move out of the way quickly should the need arise.
4. A buoyancy aid is of no use whatsoever unless it is worn. On this occasion, it was fortunate that the injured passenger did not lose consciousness. Had he done so, his chances of survival without a buoyancy aid or lifejacket would have been considerably reduced.
5. Thankfully, most boat owners never have to use their emergency flares in danger. However, all flares must be periodically checked and renewed when past their "use-by" date. Otherwise they may fail to work, when needed.

# When Danger Lurks Between the Sheets

## Narrative

Two recent accidents on board identical yachts bear remarkable similarities in every respect including, regrettably, the nature of the very serious injuries suffered by a crew member of each boat.

The yachts were both Jeanneau Sunfast 37s which were rigged for racing, on bareboat charter, and were sailing in the Solent in winds exceeding 30 knots.

One accident occurred as the yacht was manoeuvring before the start of a championship race while the other happened as the vessel was entering Portsmouth Harbour when racing had been cancelled due to freshening winds.

The yachts were sailing under mainsail only; one with a single reef and one with 2 reefs in the main, and in both cases the injuries occurred as the boats were gybed. Both injured persons were struck by the fine tuning block (Figures 1 and 2), which is part of the falls of the main sheet, as the boom passed across the cockpit.

The crews of the boats all had previous sailing experience, although in some cases this was limited to smaller boats. One crew was an experienced racing team while the other had not raced together as a team before.

Both skippers were very experienced, competent, yachtsmen, as required by the charterer, who had significant previous sailing experience on similar boats.

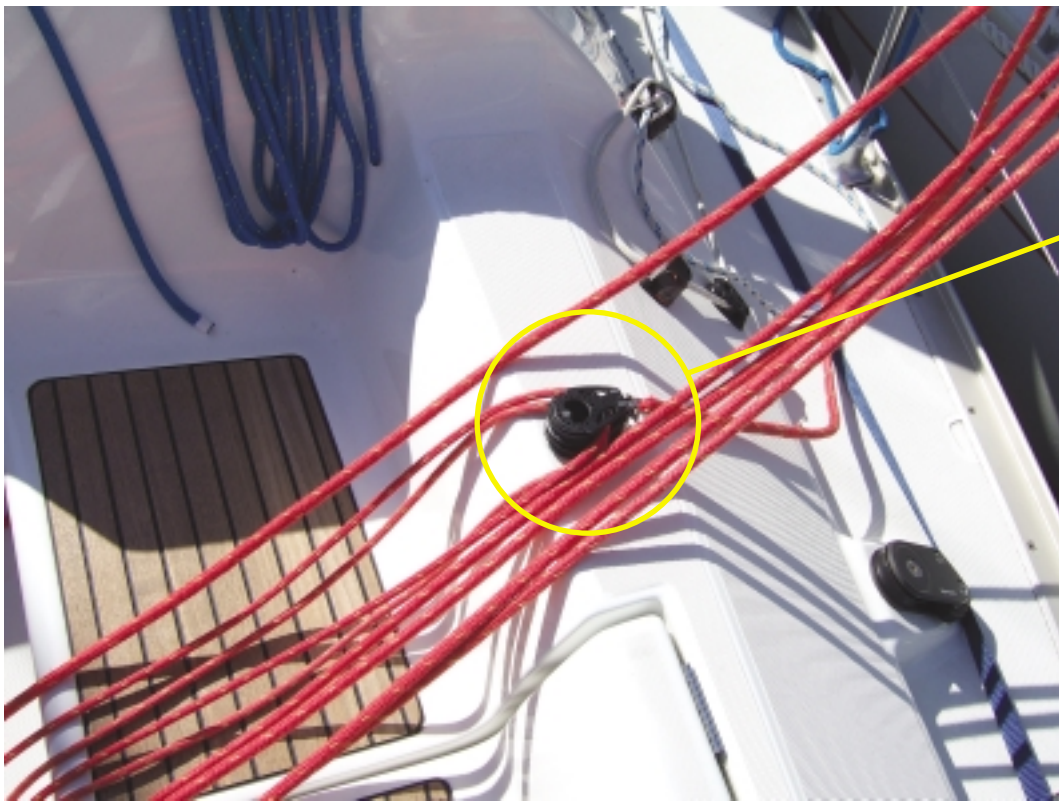
The gybe manoeuvre was planned and properly forewarned in both cases, though in one case the manoeuvre could be considered a crash gybe, as the crew were physically forcing the main across during the manoeuvre in order to position the boat in a favourable position for the start of a race.

As the boats were gybed the injured persons were both struck in the head by the fine tuning block and were thrown against the side of the cockpit. Both suffered life threatening injuries as a result of the accidents and spent a considerable time in the intensive care unit of the same hospital.

## The Lessons

1. Skippers should ensure that their crew briefing takes account of the individuals' previous experience and their familiarity with the rig and fittings on the boat.
2. The main hazard associated with a gybe is generally perceived to be from the boom. This accident shows that all crew must be aware of the dangers of being struck by the sheets and associated gear as the boom passes safely overhead.
3. Charter companies should take into consideration that the members of a crew taking a boat on bareboat charter might not have sailed together before, and their handover briefing should include reference to the particular hazards on the vessel which the less experienced members of the crew might not have previously encountered.

# CASE 25



Fine tuning block

Figure 1



The fine tuning block is at head height when sailing — crew should keep clear of this, particularly during a gybe

Figure 2

# Smoke Without Fire

## Narrative

An inland passenger craft with 55 people on board was on a sightseeing tour of a large inland waterway. At 1732, she was approaching lock gates when her engine started to overheat and a sudden reduction in power was experienced. The skipper then saw what appeared to be black smoke coming from the engine compartment, and decided to put the vessel alongside adjacent to the lock gates. The vessel berthed at 1735 and, after the skipper ordered everyone to abandon ship, using the public address system, the vessel was clear of passengers by 1740.

The skipper then broadcast a “Mayday” via VHF channel 16. The broadcast was acknowledged by the coastguard, which requested an exact position. In order to save time, the skipper opted to send this information by activating the vessel’s GMDSS DSC alarm. This alarm was

not received by the coastguard, but sufficient information had been given during the initial broadcast to despatch the fire service to the correct location. The skipper readied the vessel’s fire extinguishers, activated the fuel cut off switch and removed a gas cylinder from the galley. Fumes continued to come from the engine room vents, but the space was not entered until the fire service arrived at 1753. It was discovered that there was no fire, and that the fumes were engine exhaust gases that had escaped from a rubber hose, which had melted.

Investigation revealed that during the skipper’s checks before sailing, a rubber ‘O’ seal had been misplaced from a screw top while cleaning out the weed trap associated with the engine’s cooling water system. Consequently, air had been drawn into the system, starving the engine and its exhaust system of its cooling water.

## The Lessons

1. GMDSS DSC is a simple and effective distress alerting system with which all UK coastguard stations are equipped. However, users of inland waterways should note that the UK VHF DSC network is predominately oriented seawards, and might not provide DSC communications on inland waterways. In these waters, the use of VHF radio remains the primary means of distress, safety, and calling communications.
2. After working on any pressurised system, it is important that all seals are checked before the system is used. It is also good practice to ensure that the seals are re-checked shortly after start up.
3. Had there been a fire in the engine room, the prompt action taken by the skipper to get his passengers clear of danger, and to request assistance, would probably have prevented serious injury, or even saved lives.