

Report on the investigation of
the collision between

Two Cardiff Bay Yacht Club RIBs

resulting in injuries to three students

27 October 2010



**Extract from
The United Kingdom Merchant Shipping
(Accident Reporting and Investigation)
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GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS

CBYC	Cardiff Bay Yacht Club
CHA	Cardiff Harbour Authority
COLREGS	International Regulations for Preventing Collisions at Sea, 1972
GRP	glass reinforced plastic
hp	horsepower (1 horsepower = 0.746 Kilowatts)
IOCA	International Optimist Class Association (UK)
knots	A measure of speed in nautical miles per hour
LNTM	Local Notice to Mariners
m	metre(s)
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
PB2	Powerboat Certificate Level 2
PMSC	Port Marine Safety Code
RCD	Recreational Craft Directive
RIB	Rigid Inflatable Boat
RTC	recognised training centre
RYA	Royal Yachting Association
SMS	safety management system
UTC	Universal Co-ordinated Time
VHF	very high frequency
WYA	Welsh Yachting Association

Times: All times used in this report are UTC + 1 unless otherwise stated

SYNOPSIS



On 27 October 2010, two Rigid Inflatable Boats (RIBs) belonging to the Cardiff Bay Yacht Club (CBYC) collided while transporting a number of children across Cardiff Bay. As a result of the impact three children were thrown into the water, while others suffered abrasions and muscular injuries.

The children, all girls, were participants in an International Optimist Class Association (UK) (IOCA) training event. Following an evening social activity, the group were being ferried from the clubhouse across Cardiff Bay to their accommodation.

The two RIBs carried no navigation lights or torches and were proceeding at about 20 knots in the dark. They were being driven by 17 year olds who held Royal Yachting Association (RYA) Powerboat Level 2 certificates, a qualification that did not equip them for night-time operations.

A Cardiff Harbour Authority (CHA) 'common sense regulation' which stated that '*persons under the age of 18 years must not take charge of a power driven vessel with an engine exceeding 5 horse power*' was in force at the time of the accident. However, the CBYC chief instructor was unaware of the regulation when he appointed the drivers to the two RIBs, which were equipped with 50 horsepower engines.

The investigation identified a number of safety issues. These include a lack of planning and risk assessment for the night-time ferrying activity, poor awareness of harbour regulations, and shortcomings in the CBYC's maintenance and safety procedures for its boats.

A recommendation has been made to the Cardiff Bay Yacht Club which seeks to improve the club's safety management system and control of risk. Recommendations have also been made to the Cardiff Harbour Authority to confirm the appointment of a designated person and measures to improve stakeholders' awareness about the statutory role of the authority

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF CARDIFF BAY YACHT CLUB RIBS AND ACCIDENT

Vessel details

RIB 1	:	Ribcraft 4.8 Pro
Built	:	2010
Construction	:	GRP hull with rubber inflatable tubing
Length overall	:	4.8m
Engine power and type	:	50hp, Suzuki Four Stroke
Service speed	:	20 knots

RIB 2 Tornado Multi Purpose 5.4

Built	:	1997
Construction	:	GRP with rubber inflatable tubing
Length overall	:	5.4m
Engine power and type	:	50hp, Yamaha Four Stroke
Service speed	:	20 knots

Accident details

Type of marine casualty or incident	:	Serious Marine Casualty
Time and date	:	2008 on 27 October 2010
Location of incident	:	Cardiff Bay, approximately 250m north-east of Cardiff Bay Yacht Club
Persons on board	:	RIB 1: 7 (driver + 6 girl students) RIB 2: 6 (driver + 1 adult + 4 girl students)
Injuries	:	One girl suffered injuries which were later diagnosed as a “traumatic brain injury of moderate severity” and post-concussion syndrome; another suffered cuts, bruising and torn rib muscles; and a third suffered whiplash and injuries to her thoracic and lower spinal regions.

1.2 BACKGROUND

The role of the International Optimist Class Association (UK) (IOCA) is to govern and promote the sailing and racing of Optimist¹ dinghies and to encourage and facilitate training of young people to sail and race. IOCA is run on a voluntary basis with funding support for some activities, coaching and international team squad training, provided by the Royal Yachting Association (RYA).

IOCA organises an annual programme of yacht racing and race coaching events for its members, and runs four major competitive events annually in accordance with RYA Junior Racing policies². The participants in these events are typically members of the national and intermediate sailing squads. The teams which represent the UK in international sailing competitions are selected from these squads.

IOCA normally undertakes thorough, documented, risk assessments and provides the race officers, safety boats and competent drivers for these events.

In addition to the structured training and racing events, an open race coaching week, specifically for girls, is held annually in October. During the summer of 2010, the IOCA committee member responsible for girls' training made arrangements with the chief instructor of the Cardiff Bay Yacht Club (CBYC) to hold the 2010 girls' training week in Cardiff Bay. The chief instructor was an RYA qualified sailing instructor, who had organised several similar IOCA events at different venues in the past.

This was the first time the event had been held in Cardiff; previously it had been staged at a sailing club with on-site accommodation for the participants.

The CBYC has no on-site accommodation and, therefore, rooms were booked for the participants at a suitable youth hostel near Mermaid Quay on the opposite side of Cardiff Bay from the yacht club (**Figure 1**). It was agreed by the chief instructor that the girls would be ferried daily between the hostel and CBYC in club boats.

No risk assessments were undertaken by either IOCA or the chief instructor in respect of the event or the journeys across the bay in CBYC boats.

The event was held in the school half-term with 24 girls aged between 10 and 14 taking part. Their sailing abilities varied between racing novices and members of the Optimist national and intermediate squads.

1.3 NARRATIVE

1.3.1 Joining instructions

On 19 October 2010, IOCA informed the participants' parents by email that the girls should arrive at CBYC by 1000 on 25 October and that the event would finish at 1600 on 28 October.

The joining instructions gave information regarding accommodation and meals, and provided advice about clothing requirements for both sailing and the planned evening activities, which included swimming and ice skating.

¹ The Optimist sailing dinghy is 2.36m in length and is the entry level dinghy for junior sailing (for sailors up to 15 years of age).

² The RYA publishes a range of policy guidance for junior sailing which can be viewed at: <http://www.rya.org.uk/racing/youthjunior/information/Pages/Policies.aspx>



Cardiff Bay

IOCA made arrangements for three of the parents to stay with the girls for the duration of the event to act as “house mothers”.

1.3.2 Training event

The girls arrived at CBYC on the morning of Monday 25 October and were advised of the programme for the training event. They were divided into four groups, each supervised by an RYA sailing coach, and then went afloat to commence their training.

The first day’s sailing completed at about 1600 and the girls then changed into their leisure clothing prior to their evening activity, which on this night was swimming in a pool close to the yacht club. They returned to the club at about 1800, where they had their evening meal. It was dark by the time the girls were taken from CBYC to Mermaid Quay (**Figure 1**) in four RIBs owned by the club.

For the passage to Mermaid Quay, the girls all wore the buoyancy aids that they had used while sailing during the day. The majority of these buoyancy aids were dark coloured and none had lights attached to them. During the trip, the girls predominantly sat on the tubes of the RIBs, as the boats had insufficient seats to accommodate all the passengers.

The following morning the girls, together with two of the house mothers, were collected from Mermaid Quay and returned to the yacht club in the four RIBs. The chief instructor watched the boats as they crossed the bay and saw some of the

RIBs being driven in an apparently reckless manner. He later reprimanded the relevant drivers, informing them that such behaviour was not acceptable and should not be repeated.

The previous evening, the IOCA committee member who was organising the event had noticed that none of the club's RIBs carried navigation lights. She discussed this with the chief instructor during the morning, and he advised her that the boats did not need to show navigation lights.

On completion of the second day's sailing the girls had their evening meal at the club and were taken back to Mermaid Quay, again in the four RIBs, where they arrived at about 1730. They returned to the hostel and then went ten-pin bowling. Several of the coaches also attended this activity and returned across the bay to CBYC in the club RIBs later that evening.

On Wednesday 27 October at about 0900, the girls and two of the house mothers were collected from Mermaid Quay by the four RIBs and taken across the bay. One or two of the RIBs were occasionally swerving, so as to thrill the occupants, some of whom appeared to encourage this action. Two of the house mothers were quite concerned about this behaviour, but did not consider they could comment to the drivers on the operation of the boats.

The day was divided between group training sessions, debriefs ashore, lunch and then races in the afternoon. The girls finished sailing at 1630 and changed into leisure clothing they had brought with them in the morning, for the evening activity of ice skating.

The ice rink was located close to the yacht club and the girls were there from about 1700 to 1830, after which they returned to the club for their evening meal. At about 1950 the girls finished their meal and packed their sailing kit into bags to take back with them to the hostel.

During the ice skating, one of the girls had fallen heavily and had hurt her back so she, together with three other girls and two of the house mothers, returned to the hostel by car.

1.3.3 The collision

At about 2000 the remaining 20 girls donned their buoyancy aids and boarded the four RIBs for the trip to Mermaid Quay.

The chief instructor was driving the lead RIB, and the second RIB was driven by a sailing instructor who held an RYA advanced powerboat certificate. Both drivers were carrying very high frequency (VHF) radios. The two remaining RIBs were driven by two 17 year old sailing instructors who did not have VHF radios with them.

In the darkness, the four RIBs left the pontoons and proceeded at slow speed through the mooring area adjacent to the club. Once clear, the first two RIBs increased speed and headed directly towards Mermaid Quay.

The RIBs driven by the two 17 year olds were behind the leading boats when they cleared the mooring area. As they entered clear water, the last two boats increased speed to about 20 knots and started to separate. One, a dark blue tubed Ribcraft

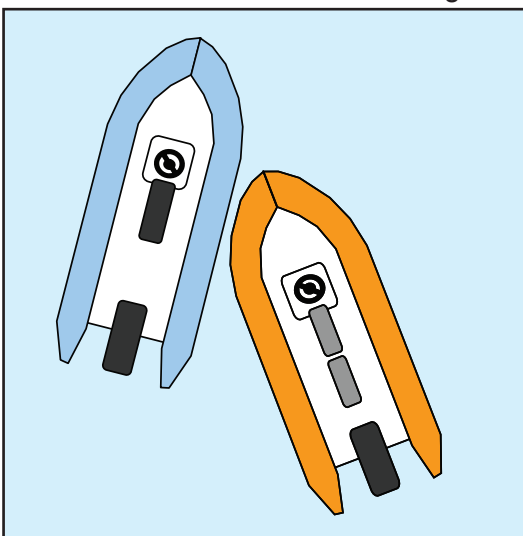
RIB, with its driver and six girls on board, set off to the left of the track taken by the first two RIBs. The other, an orange tubed Tornado RIB, with its driver, a house mother and four girls on board, set off to the right, passing close to moored craft on the outer edge of the moorings (**Figure 2**). The driver of this RIB soon became concerned about approaching too close to the locks, and swung the boat back to port towards the centre of the bay.

Figure 2



Track of the RIBs prior to the collision

Figure 3



Angle of RIBs at time of collision

The Tornado RIB was probably heading towards the mouth of the River Taff when the driver suddenly saw the starboard side of the Ribcraft RIB very close ahead. Although the driver reduced the boat's speed and started to turn to starboard, collision could not be avoided (**Figure 3**).

The driver of the Ribcraft RIB had not seen the other boat before the collision occurred. On impact, the Ribcraft RIB heeled over to port and the port buoyancy tube of the Tornado RIB momentarily went under the starboard buoyancy tube of the Ribcraft RIB before the boats separated.

1.3.4 Post-collision

As a result of the collision three girls fell overboard, while others were thrown around within the boats. One girl was ejected from one boat into the other at the point of impact.

Of the three girls who entered the water, one managed to cling onto a buoyancy tube grab rope at the side of her boat while another, who had been sitting on the port buoyancy tube of the Ribcraft RIB, fell into the water away from the boat.

A third girl, who had been sitting on the port buoyancy tube of the Tornado RIB close to the steering console, was ejected backwards out of the boat. As she was thrown overboard her legs probably struck the steering console and her head and shoulders are believed to have made contact with the starboard buoyancy tube of the Ribcraft RIB, causing her to lose consciousness for a brief period, before she fell into the water between the two boats.

In addition to the girls who fell overboard, some of the girls' clothing bags were thrown into the water as a result of the collision.

The two young drivers quickly stopped their boats after the collision and conducted a headcount. This was confused because one girl had been thrown from the Ribcraft RIB into the Tornado RIB thereby initially masking the fact that a girl had fallen overboard from the Tornado RIB.

The girl who was holding onto the buoyancy tube grab rope of the Ribcraft RIB was quickly recovered. The recovery of the remaining two girls began immediately the headcount had been completed, but this was hampered by the darkness and the floating clothing bags that were initially mistaken for heads. Notwithstanding these difficulties, the girls were soon successfully recovered back into their boats.

Around the time of the collision, the chief instructor noticed that the two RIBs were not following him as he had expected, and he turned back from the middle of the bay to check on them. When he arrived on scene, the young drivers informed him of the collision, and that some of the girls had fallen into the water but had all been recovered. He instructed the drivers to continue their passage to Mermaid Quay, where the girls disembarked from the RIBs to return to the hostel.

All four RIBs then returned to the yacht club where the chief instructor and the club's Commodore interviewed the two drivers involved in the collision.

1.3.5 Post-accident care

When the girls arrived back at the hostel they were accompanied by the house mother who had been on one of the RIBs involved in the collision. This house mother was medically trained, and she ensured that the girls who had been in the water took hot showers and were given warm drinks.

The other two house mothers, who had travelled by car, then arrived at the hostel. One of these was the event organiser, who was also medically trained; she immediately re-checked the condition of all the girls who had been involved in the collision, particularly those who had been in the water.

Once she had assured herself that none of the girls appeared to require medical attention, she telephoned their parents to inform them in general terms of the accident. She also checked the condition of the girls again before going to bed, and they all appeared to be well.

1.4 INJURIES SUSTAINED

Although not immediately apparent, several girls from both boats suffered bruising and soreness following the collision. Three girls in particular received injuries which required subsequent extended medical treatment.

The girl who is believed to have made contact with the buoyancy tube of the other boat as she was ejected backwards into the water became quite unwell 2 days after the accident, and was admitted to hospital for observation. She has been diagnosed as having sustained a “traumatic brain injury of moderate severity” and suffered concussion with post-concussion syndrome. She also experienced blurred vision and migraine episodes with accompanying fatigue and light sensitivity which remained unresolved at the time of publication of this report. This required specialist medical treatment which affected her education.

One of the girls had been thrown forward within one of the boats and made contact with the steering console. As well as sustaining small lacerations, she had a stiff back which became progressively worse. She was subsequently diagnosed as having suffered an acute side bending strain, resulting in muscle hypertonia at T2/3 and T8/9 segments of her thoracic spine. She still required osteopathic treatment for these injuries at the time of publication of this report.

Another girl, who had been sitting on the deck in the bow of one of the RIBs, suffered whiplash injuries to her neck, and also spinal injuries to the thoracic and lumbar region. These required physiotherapy treatment for several months after the accident.

1.5 ENVIRONMENTAL CONDITIONS

On the day of the accident, sunset occurred at 1755, and at 2000 it was dry and clear with a south-westerly wind blowing at 11 knots. The air temperature was 12.9°C, and the water temperature was 10°C.

1.6 PERSONNEL

1.6.1 CBYC chief instructor

CBYC’s chief instructor was an experienced yachtsman who had sailed for many years in the Cardiff area. He held RYA qualifications as a Sailing Instructor level 3, and as a Powerboat Instructor.

He had organised several previous open training events for IOCA as well as training events and competitions for the IOCA national development squad. He had also coached sailing events for other RYA Class associations.

During the week of the accident he was responsible for other training events, involving dinghies from different classes, that were also taking place in Cardiff Bay and based at the CBYC.

1.6.2 Driver of Ribcraft RIB

The driver of the Ribcraft RIB was 17 years old at the time of the accident. She held an RYA National Powerboat Certificate Level 2³(PB2), which she had obtained at the CBYC in 2009 following examination by the club's chief instructor.

She was an experienced dinghy sailor, having been sailing at the club under the tutelage of the chief instructor for 8 years. She had represented Great Britain in international yacht racing events and was an RYA qualified dinghy instructor.

1.6.3 Driver of Tornado RIB

The driver of the Tornado RIB was 17 years old at the time of the accident. She also held a PB2, obtained at the CBYC in 2009 following examination by the club's chief instructor.

She was also an experienced dinghy sailor, having sailed at the club for 5 years, and had represented Great Britain at international yacht racing events. She, too, was an RYA qualified dinghy instructor.

1.7 BOATS AND EQUIPMENT

1.7.1 Boat coding/licensing

The RIBs were not coded as 'small vessels in commercial use for sport or pleasure'⁴ and were not licensed for the carriage of passengers. Cardiff Harbour Authority issued licences to vessels plying for hire within Cardiff Bay. As a condition of granting the licence, appropriate vessels were required to hold a valid small commercial vessel code certificate issued by the Maritime and Coastguard Agency (MCA). No CHA licences had been issued in respect of any of the RIBs owned by CBYC.

1.7.2 The Recreational Craft Regulations 2004

Schedule 1, 2.2 of these regulations states:

Builder's Plate

"Each craft shall carry a permanently affixed plate mounted separately from the boat hull identification number, containing the following information:

- *Manufacturer's name*
- *CE Marking*
- *boat design category*
- *manufacturer's maximum recommended load derived from section 3.6 excluding the weight of the contents of the fixed tanks when full*
- *number of persons recommended by the manufacturer for which the boat was designed to carry when underway".*

³ RYA National Powerboat Course Level 2. The syllabus for this course does not include any elements of night operation.

⁴ Such craft are often referred to as "code boats". See Maritime and Coastguard Agency, Marine Guidance Note (MGN) 280. (<http://www.mcga.gov.uk/c4mca/mcga-mnotice.htm?textobjid=C423704CA95E9786>)

1.7.3 Ribcraft RIB

The Ribcraft RIB (**Figure 4**) was built in 2010. Fitted with blue buoyancy tubes and a single jockey seat for the driver, it was powered by a 50 horsepower (hp) outboard engine that, subsequent trials demonstrated, gave the boat a top speed of 25 knots with a similar weight loading to that at the time of the accident.

The builder's plate (**Figure 5**) located on the transom showed that the boat's manufacturers recommended that the RIB could carry up to six people while underway. At the time of the collision there were seven persons on board.

The boat was observed to be in very good fabric condition.

1.7.4 Tornado RIB

The Tornado RIB (**Figure 6**) was built in 1997, prior to the introduction of the Recreational Craft Directive (RCD), and no builder's plate was fitted. Fitted with orange buoyancy tubes and two jockey seats, it was powered by a 50hp engine. The boat was observed to be in a generally poor fabric condition.

1.7.5 Equipment and fittings

When MAIB inspectors attended CBYC the only equipment found in the boats involved in the collision was an anchor and warp. Four, time expired, pyrotechnic flares were found in a locker on the Tornado RIB involved in the collision. It was noted that the grab rope was missing from one of the other boats in use during the week.

1.8 CARDIFF BAY YACHT CLUB

CBYC is a popular members' club with yachting, fishing and motor boat sections. The club members elect a management committee, which in turn employs staff to run the club on a day to day basis. The club maintains an accident book; no record of the collision was entered into this book.

CBYC is affiliated to the RYA and is also a member of the Welsh Yachting Association (WYA).

1.8.1 RYA Training Centre

CBYC was an RYA recognised training centre. The training centre was managed by the chief instructor who was self-employed and not a club employee. The chief instructor controlled the training centre's budget, which was set by the club's management committee.

1.8.2 CBYC Operational and Safety handbook

The club had produced an Operational and Safety handbook, which was "*designed to ensure that all coaching staff, race officers and volunteers are completely conversant with the CBYC's general and specific safety policies in each of the activities organised by the training centre*".



Figure 4

The Ribcraft RIB involved in the collision



Figure 5

The Recreational Craft Directive plate in the Ribcraft RIB



Figure 6

The Tornado RIB involved in the collision

The entry in the club's handbook under the heading *Safety Equipment* stated that:

“First aid kit, survival bag, knife and whistle should be carried at all times. Grab bags MUST be taken out in rescue and teaching boats. In addition, specialist items may be needed for other activities”.

At the time of the accident there were no safety equipment grab bags on the boats involved in the collision.

1.8.3 RYA Annual Inspection, 2010

The CBYC training centre was inspected annually by the RYA to ensure it continued to meet the RYA's required standards for the teaching of sailing and powerboating.

The 2010 inspection was carried out on 15 September when the RYA inspector noted in the action plan (**Annex A**) that the club's powerboats *“when operating in the Bay don't carry all equipment on check list but they do when outside the Bay”*. However, no entry was made in the action plan column headed *“To be completed by”*.

The checklist referred to by the inspector was the Powerboat checklist contained in the Guidance Notes for RYA training centres in the UK (**Annex B**).

When MAIB inspectors visited CBYC some 5 weeks after the accident, they were advised that no grab bags were available for the boats.

1.9 CARDIFF HARBOUR AUTHORITY

Cardiff Bay is a 200 hectare freshwater lake and is home to two sailing and boating clubs. There are a number of licensed passenger craft based in the bay who share the area with a variety of craft, including canoes and water skiers based at the popular water activity centre.

The Cardiff Harbour Authority was formed in 2000 under powers conferred by the Cardiff Bay Barrage Act 1993. CHA is the statutory harbour authority for the waters of Cardiff Bay inside a line drawn close to seaward of the barrage (**Figure 7**).

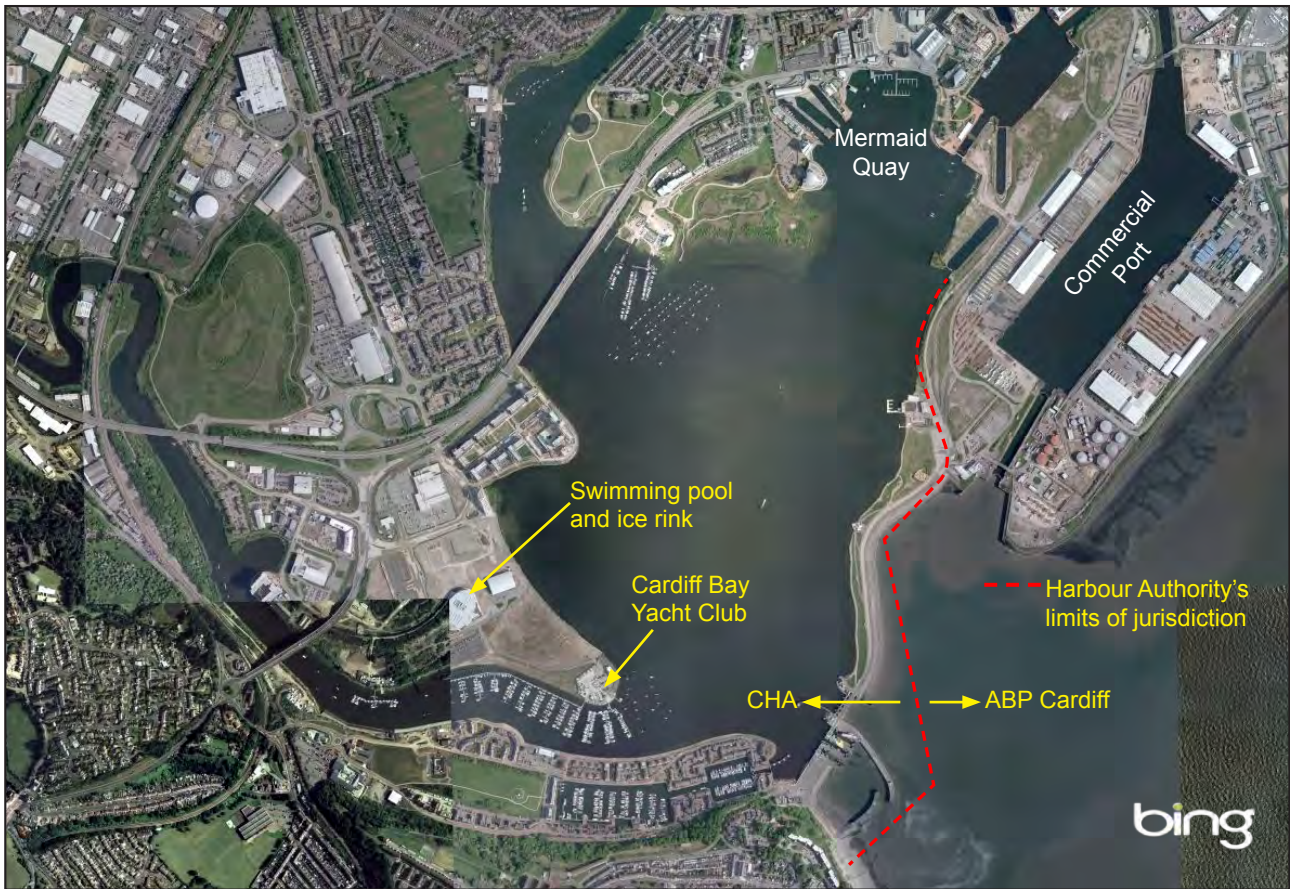
The strategic management of CHA is undertaken by Cardiff Council. Although a formal compliance statement had not been provided to the Department of Transport, the Council considered CHA to be fully compliant with the voluntary Port Marine Safety Code (PMSC)⁵ and the Council's executive held collective and individual responsibility as the 'duty holder'⁶.

⁵ PMSC. First introduced by the UK Government in 2000 and updated in 2009 the Code has been developed to improve safety in UK ports and to enable harbour authorities to manage their marine operations to nationally agreed standards. It provides the standard against which the policies, procedures and the performance of harbour authorities can be measured. It also describes the role of board members, officers and key personnel in relation to safety of navigation and summarises the main statutory duties and powers of harbour authorities. As well as complying with these duties and powers, the authority must develop an effective marine safety management system based on formal risk assessment. When fully implemented, the Code should reduce the risk of incidents occurring in harbour waters and provide some protection for the duty holder if an incident does occur.

⁶ Each harbour authority must have a "duty holder" who is accountable for its compliance with the PMSC and its performance in ensuring safe marine operations in the harbour and its approaches. For most harbour authorities, the role of duty holder is undertaken by members of the harbour board who are (both collectively and individually) accountable for marine safety under the PMSC.

An operations manager, who reported to a chief officer of Cardiff Council, was responsible for the day to day operational management of CHA. The harbourmaster worked for the operations manager and was responsible for the safety of navigation in Cardiff Bay, although he was not responsible for the operation of the barrage.

Figure 7



Cardiff Bay showing the Cardiff Harbour Authority's area of jurisdiction

1.9.1 Designated Person

Section 2.8 of the PMSC refers to the appointment of a designated person and states that *“Each harbour authority must appoint an individual as the designated person to provide independent assurance directly to the duty holder that the marine safety management system, for which the duty holder is responsible, is working effectively. Their main responsibility is to determine, through assessment and audit, the effectiveness of the marine safety management system in ensuring compliance with the Code”*.

At the time of the accident, a designated person had not been appointed within CHA.

1.9.2 CHA harbour byelaws

The CHA harbour byelaws were confirmed in January 2009 and are enforceable through judicial process.

Byelaws 11 and 12 (**Annex C**) require masters of vessels and users of pleasure craft to report collisions, which have caused damage to other vessels, to the harbourmaster as soon as is reasonably practicable.

1.9.3 CHA harbour regulations

In addition to its byelaws, CHA has harbour regulations, which are posted on the authority's website.

Regulation 6.0 states: "*Persons under the age of 18 years must not take charge of a power driven vessel with an engine in excess of 5 horse power*".

1.9.4 Bay Users Guide

CHA publishes an annual Bay Users Guide which includes information about the procedures for locking in and out of the barrage and contains a section on navigation in the bay. This section lists a number of "*common sense regulations to ensure that all users are able to enjoy the Bay*".

Regulation 1 states "*Except where stated otherwise, the international Regulations for the prevention of Collision at Sea (Rules of the Road) apply within the Bay*". [sic]

The numbering of the regulations listed in the Bay Users Guide did not correspond to that used by the harbour regulations posted on the CHA's website.

1.9.5 Local Notices to Mariners (LNTM)

LNTM 34 of 2010 (**Annex D**), issued on 5 October 2010, related to the visibility of low freeboard craft navigating in Cardiff Bay and the rivers Taff and Ely. The notice specifically identified the local requirement for such craft (primarily rowers and paddlers) to show bow and stern high intensity lights during the winter months. This enhanced the requirements in the International Regulation for Prevention of Collisions at Sea (COLREGS), Rule 25 d (ii)⁷ for such vessels to carry a torch or lantern.

LNTM 34 also prohibited low freeboard vessels from navigating in the main bay during poor visibility or in darkness.

1.9.6 Marine Safety Management System

In 2002, CHA employed consultants to undertake marine risk assessments and produce a marine safety management system (SMS) in order to comply with the requirements of the PMSC. No formal review of the SMS had been undertaken since its adoption in 2002. However, prior to the accident, CHA had commenced work to update its SMS.

⁷ COLREGS Rule 25 d (ii) A vessel under oars may exhibit the lights prescribed in this Rule for sailing vessels, but if she does not, she shall have ready at hand an electric torch or lighted lantern showing a white light which shall be exhibited in sufficient time to prevent collision.

1.9.7 Stakeholder consultation

CHA holds regular meetings with its stakeholders at which a range of topics are discussed. At a meeting held in October 2010, the requirement for all accidents to be reported to the harbour authority was reiterated to stakeholders. The importance of maintaining records of all such accidents, to facilitate the effective review of navigational risk assessments, was also emphasised to the stakeholders present at the meeting, which included representatives from CBYC.

1.9.8 Flotsam

CHA annually removes approximately 1000 tonnes of flotsam from Cardiff Bay, consisting of a range of items from tree trunks and branches to domestic rubbish and other debris (**Figure 8**). While 80-85% of the debris is captured by booms on the rivers Taff and Ely, the remainder is blown onto the banks of the rivers or onto the shoreline of the bay and is collected from there. Semi-submerged items which pose a hazard to surface navigation, are occasionally reported in the main body of the bay and recovered by CHA debris collection vessels.

Figure 8



Examples of flotsam recovered from Cardiff Bay

1.10 REPORTING THE ACCIDENT

The RYA became aware of the accident on the morning of 28 October, and later that day received an interim report from CBYC's chief instructor. A more comprehensive report was prepared by members of CBYC and sent to the RYA on 24 November 2010. The accident was reported to MAIB on 25 November 2010, and to the harbourmaster on 14 December 2010.

1.11 PREVIOUS ACCIDENTS

In August 2008⁸, a female passenger on board a 9m RIB suffered a lower back wedge compression fracture. The boat was conducting a 'thrill ride' in the Bristol Channel and the injury occurred when the passenger landed heavily on her seat after she had been momentarily lifted into the air due to the motion of the craft.

In February 2009, a RIB operating from the Plas Menai National Watersports Centre in Wales capsized while carrying a party of school children, injuring one of them. At the time of the accident the children had completed the main activity of the day and were being taken from the centre for an evening trip to go kite flying.

The MAIB conducted an investigation into the accident and published a report⁹ which concluded that the RIB had capsized when it encountered rough water during an unauthorised deviation from a planned powerboat trip. The investigation identified a number of safety issues, which included shortcomings in planning, control, leadership and communications.

As a result of this accident the MAIB made a recommendation to the RYA to produce guidance for RYA training centres offering powerboating activities other than RYA recognised tuition (**Annex E**). The report made recommendations to the Plas Menai Centre to review its risk assessments and to provide staff with guidance on, inter alia, considerations for 'journeying'¹⁰ and similar activities.

Some of the CBYC members who undertook the club's investigation of the collision were aware of the Plas Menai accident but were not aware of the MAIB investigation or the RYA guidance to training centres.

In January 2011 the MAIB issued a report¹¹ following the investigation of an accident in which a passenger travelling in a RIB received serious spinal injuries while not seated in an appropriate seat.

⁸ http://www.maib.gov.uk/publications/investigation_reports/2009/celtic_pioneer.cfm

⁹ http://www.maib.gov.uk/publications/investigation_reports/2009/rib_6.cfm

¹⁰ Journeying: the term given when RIBs or other boats at a training centre are used as a means of transport rather than for powerboat training or tuition.

¹¹ http://www.maib.gov.uk/publications/investigation_reports/2011/delta_rib.cfm

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 PLANNING OF THE EVENT

2.2.1 IOCA

The girls' open race training event, although a regular feature of the IOCA calendar, was not subject to the rigorous planning and risk assessments undertaken by IOCA for race meetings and other major sailing events.

The arrangements for the race training week, including the transport of the girls across Cardiff Bay were, in the main, left to CBYC's chief instructor to organise. This led to IOCA having a lack of oversight of the event, even though the participants and their families could reasonably have expected that it would be subject to the same high standards of safety apparent at the other IOCA events.

There is no evidence to suggest that the race training, which took place during the day, was not conducted safely. However, the fact that IOCA was not involved in assessing the risks involved in transporting the children across Cardiff Bay at night was a significant omission in the planning of this event.

2.2.2 CBYC chief instructor

When the CBYC chief instructor agreed to stage the open race training event in Cardiff Bay, hosted by CBYC, he was bringing the event to waters he knew intimately.

He had sailed the waters of Cardiff Bay for many years and, as chief instructor at CBYC, had organised and run sailing events from the club in the past. This familiarity might have led to a degree of complacency regarding the hazards involved, and thus the need to undertake a specific risk assessment for this event was not recognised.

This was the first occasion on which, as part of a sailing event based at CBYC, participants were to be transported across the bay at night. At no stage was the planning for this part of the event given the consideration required for such a potentially hazardous passage.

2.2.3 Selection of the RIB drivers

From the initial planning discussions for this event, it was known that there would be a requirement to operate power-driven craft at night to ferry the girls between CBYC and their accommodation.

The syllabus of PB2 does not include powerboat operation by night and the CHA 'common sense regulations' for Cardiff Bay did not permit anyone under the age of 18 to operate power-driven craft with engines of more than 5hp at any time.

The CBYC chief instructor should have recognised that the two 17 year old coaches were not sufficiently trained or experienced to safely operate power-driven craft at night without close supervision. He should also have been aware of the harbour authority's stance, ie that they should not operate the club RIBs in Cardiff Bay at any time.

If an appropriate risk assessment had been undertaken for the evening trips, the unsuitability of the young drivers for the task would have been recognised.

2.3 THE ROLE OF VOLUNTEERS

Participation in sailing events like the IOCA training week is undoubtedly beneficial to children, both for the improvement of their sailing skills and for the development of their self-confidence and resilience. However, when involved in such events, adult volunteers and coaches must ensure that they remain vigilant at all times to the potential risks to the children.

During the week, some of the RIBs were observed being driven inappropriately, apparently to thrill the children at their request, when journeying between Mermaid Quay and the club. Although house mothers were present on the boats when this activity took place and were concerned, they did not indicate to the drivers that this was inappropriate behaviour. This was probably due to uncertainty as to whether it was appropriate for them to question or challenge aspects of what they considered to be an inappropriate activity.

Organisers of events involving volunteers should ensure that the volunteers are provided with clear guidelines as to their responsibilities to raise any concerns they have about the conduct of activities, and the means by which they should do so.

2.4 THRILL SEEKING BEHAVIOUR

Driving RIBs at speed through waves and across the wash of other craft, known commercially as "thrill rides", can be carried out safely providing all the risks are properly identified and mitigated.

The MAIB reports listed in Section 1.11 all concern accidents where an activity was not well considered, or the injured passenger was not appropriately seated, or both. In two of the cases the passengers suffered serious spinal injuries. The safety issues arising from these investigations highlight the importance of careful risk consideration prior to the trip, proper driver training, and the necessity for appropriate passenger seating.

At an early stage of the IOCA event some of the RIB drivers, including one of the drivers involved in the collision, had been seen to drive in such a way as to make the ride more exciting for their passengers. These drivers did not have the training or experience required to appreciate the potential dangers of such behaviour.

The CBYC chief instructor reprimanded the drivers involved in "thrill seeking behaviour", but did not take the opportunity to review their suitability to be in charge of the boats while ferrying the girls to their accommodation at night.

2.5 NAVIGATION LIGHTS

As the two unlit RIBs approached each other before the collision, their respective aspects were such that, against the dark backgrounds of the River Taff and the barrage, neither was seen by the other until it was too late. The fact that the occupants were, in the main, wearing dark coloured buoyancy aids and clothing, and that one of the boats had dark blue buoyancy tubes, made the unlit boats and their occupants even more difficult to see at night.

All four of the CBYC RIBs were operated during darkness, without navigation lights, on both evenings prior to the collision. This practice had continued even after the absence of any navigation lights had been queried by the IOCA committee member.

To operate a boat at night without lights is in contravention of the COLREGS. If there was any doubt regarding their application in Cardiff Bay, CHA Regulation 1 clarifies that, “*except where otherwise stated*” the COLREGS apply within the bay.

Ironically, the only departure which CHA has made from the application of the Colregs in Cardiff Bay is the issue of LNTM 34 of 2010, which requires low freeboard craft (primarily rowers and paddlers) to display high intensity lights. This is a prudent enhancement of the requirements of Colreg Rule 25 d (ii) regarding the lights required to be shown by vessels under oars in the two rivers flowing into the bay.

Good local knowledge of a particular area does not obviate the fundamental requirement to comply with the COLREGS. That the CBYC chief instructor was content to allow high speed power-driven craft to operate at night, without navigation lights, demonstrates either a basic lack of knowledge and understanding of the COLREGS, or a failure to recognise the risks associated with four high speed RIBs crossing the bay in darkness in an uncoordinated manner.

2.6 SAFE SPEED

The RIBs were probably travelling at about 20 knots immediately before the collision; equating to approximately 10 metres per second, which afforded the drivers very little time in which to react to unlit objects.

The requirement to proceed at a safe speed is fundamental to the safe navigation of all vessels. Rule 6¹² of the COLREGS defines a safe speed and instructs mariners that they must be able to take proper and effective action to avoid collision and stop within a distance appropriate to the prevailing conditions.

Notwithstanding the lack of navigation lights, the RIBs were being driven by drivers who had not achieved a relevant qualification or gained experience in night navigation. They were proceeding at speed, in an area known to contain the hazards of unlit marks, unlit vessels on moorings, and flotsam. Further, the young passengers were sitting on the RIBs' tubes, so any sudden manoeuvre or collision would have the likely consequence of ejecting them from their boats.

¹²Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

Proper consideration of the night passage across the bay could have identified these hazards, and appropriate control measures including transiting at a safe speed could have been established.

2.7 SEATING ARRANGEMENTS

The Ribcraft RIB was fitted with one seat for the driver while at the time of the accident there were 7 persons in the boat, one more than the maximum recommended on the builder's plate. The other boat involved in the collision had two seats but was carrying six persons.

There are currently no regulations preventing persons in RIBs from sitting on the buoyancy tubes, and at low speeds this could be deemed acceptable. However, at high speeds, passengers who are not seated in appropriate seating have an increased risk of falling overboard and, as highlighted in recent MAIB reports, are at significant risk of suffering musculoskeletal injuries.

The guidance issued by the RYA to its training centres following the Plas Menai accident (**Annex E**) included advice that boat passengers should, where appropriate, be provided with a seat. In the case of a RIB, where passengers sit on the buoyancy tube, all passengers should have suitable handholds. CBYC should ensure that the capacity of its boats as marked on the builder's plate is not exceeded, and provide guidance on the use of its boats for the carriage of persons in excess of the available seating.

2.8 USE OF BUOYANCY AIDS ON OPEN POWER BOATS

The girls were transported across Cardiff Bay at night wearing their own buoyancy aids which, being intended for daylight sailing use, did not have lights attached.

RYA guidance on the use of personal buoyancy aids and lifejackets states that the device needs to be appropriate to the activity. The advice given recommends that a buoyancy aid is not suitable when on an open boat (eg small powerboat or RIB) when a lifejacket should be worn¹³. A buoyancy aid does not have the necessary properties to turn a wearer's face up in the event of entry into the water and a loss of consciousness. The girl who lost consciousness briefly was extremely fortunate she regained consciousness so quickly, otherwise the accident could have had fatal consequences.

The transportation of the participants across Cardiff Bay at night should have been properly assessed in advance of the event. The supply of suitable lifejackets, fitted with lights and whistles, for these journeys should have been considered as an essential control measure.

2.9 CARE OF THE INJURED GIRLS

When the girls returned to the hostel after the collision they were checked for injuries and were warmed up by taking showers and hot drinks. Their condition was monitored throughout the evening and on the following morning. The parents of those girls who had entered the water were informed of the fact during the evening.

¹³<http://www.rya.org.uk/aboutus/mediacentre/ryastatements/pages/lifejackets.aspx>

A few days after the accident it became apparent that the injuries to some of the girls would require prolonged medical attention for post-concussion syndrome, whiplash type injuries, torn muscles and strains. The fact that this was not readily apparent, even to observers with extensive medical training, reflects the resilience of the girls involved and their unwillingness to complain of personal injury in front of their friends, given the dynamics of a group situation.

The reaction of the girls immediately post-accident masked some of their injuries. To avoid recurrence, the immediate care and treatment offered to children involved in high impact accidents should be considered as part of the event risk assessment. The requirement to seek prompt medical attention should be included in the event's contingency measures.

2.10 BOAT EQUIPMENT

2.10.1 Condition and fabric maintenance of CBYC RIBs

Although the Ribcraft RIB was in good material state, the poor fabric condition of the Tornado RIB involved in the collision reflects gaps in the care and maintenance of the safety boats belonging to CBYC, an RYA recognised training centre.

CBYC should review its system for the care and maintenance of club boats to ensure they are always fit for task.

2.10.2 Safety equipment grab bags

The club's Operational and Safety handbook required that grab bags containing safety equipment were carried in rescue and teaching boats. Despite deficiencies in the carriage of grab bags having been identified during the RYA annual inspection in September, grab bags were not carried during the night of the ferrying activity on 27 October, and were still not available 5 weeks after the accident. That the only safety equipment found on board the RIBs was one set of time-expired flares, is further indication that insufficient attention was being paid to safety equipment at CBYC.

The carriage of safety equipment, maintained in a good condition and stowed in appropriate containers is a prerequisite for the operation of a safety boat. The fact that this equipment was not available for the IOCA training week indicates that the club should review its safety management system in relation to the operation and maintenance of its boats.

2.10.3 VHF radios

The CBYC Operational and Safety handbook states that VHF radios are expected to be carried by all operatives on tidal waters. However, there was no requirement for VHF radios to be carried on the waters of Cardiff Bay, which are where the majority of youth sailing events take place. Although the instructors used hand-held VHF radios when they were supervising sail training during the day, the drivers involved in the collision did not have radios with them that evening.

It was completely by chance that the chief instructor returned to the scene of the collision, and it was fortunate that all the girls had been recovered onto the boats when he arrived. In differing circumstances the drivers' inability to summon assistance in a distress situation could have had very serious consequences. CBYC

should review the provision and use of VHF radios, with the aim of ensuring that all its water-borne activities have an appropriate means of raising the alarm and communicating during emergency situations.

2.11 RYA TRAINING CENTRE – ANNUAL INSPECTION

The RYA's annual inspection of the CBYC training centre took place in September 2010. The RYA inspector noted on the inspection action plan (**Annex A**) that the craft, when operating in the bay, did not carry all the equipment specified on the checklist. However, no requirement for remedial action was stipulated in the report.

The annual report entry was too vague to be of value to the club. Entries in an inspection action plan must be concise and focused, and should clarify the responsibility and time scale for any remedial action required.

The RYA should ensure its inspectors complete inspection checklists proficiently, highlighting items requiring attention together with the responsibility and time scale for the recommended remedial action.

2.12 CARDIFF HARBOUR AUTHORITY

2.12.1 PMSC compliance

Cardiff Harbour Authority was established by legislation in 2000, and in 2002 consultants were employed to undertake a navigational risk assessment as required by the Port Marine Safety Code.

However, contrary to the requirements of the PMSC, no documented review of the authority's safety management system had been undertaken. This omission was being addressed at the time of the investigation, and revisions for its safety management system were due to be presented to the duty holder, Cardiff City Council, in April 2011.

Nonetheless, the duty holder should take action to ensure that this situation is not repeated in the future.

2.12.2 Designated person

The duty holder had not appointed a designated person when the investigation was conducted. A person with a thorough knowledge of the PMSC and associated port and marine legislation, with direct access to the executive of the city council to provide independent assurance to the duty holder, should be an essential component of the CHA's safety regime.

With no designated person appointed, the duty holder is not complying with the requirements of the PMSC and is denying itself a source of independent assurance and advice. Cardiff City Council should, therefore, consider the appointment of a designated person as soon as is practicable.

2.12.3 Harbour regulations and accident reporting

Senior members of CBYC with considerable collective experience of the bay, were not familiar with the CHA's regulations. In particular, the chief instructor was not aware of the 'common sense' Harbour Regulation 6, issued several years before this accident, which stated that "*persons under the age of 18 years must not be placed in charge of a power driven vessel with an engine exceeding 5 horse power*". Neither was he aware of the requirement to report accidents to CHA, despite this being a topic of a recent stakeholder meeting attended by club representatives.

Although CHA promulgated its regulations both on its website and in the annually published Bay Users Guide, the two sets of regulations did not correspond, giving scope for potential confusion in the minds of bay users as to exactly what regulations did apply.

The lack of knowledge of essential marine safety information demonstrated by the chief instructor and other senior members of CBYC, a major port stakeholder, suggests that there is insufficient understanding of the CHA's roles and responsibilities among some bay users. CHA should take further measures to clarify its regulations and to raise its profile both afloat and ashore to ensure that harbour users understand and respect the role of the statutory harbour authority in maintaining a safe marine environment in Cardiff Bay.

2.13 LESSONS LEARNT FROM PREVIOUS ACCIDENTS

In 2009, following an MAIB recommendation made in the Plas Menai investigation report, the RYA issued guidance to its training centres (**Annex E**) regarding powerboating activities other than recognised RYA tuition.

The guidance included reference to the need for additional risk assessments to be carried out when vessels are operated in higher risk areas, as well as the requirement for effective communications.

It is regrettable that the lessons from a previous, similar accident were not apparently recognised or understood by senior members of CBYC. The club should ensure that the safety lessons from previous accidents and RYA guidance, particularly in relation to risk assessments, are disseminated to, and properly understood and put into practice by all its key staff and officials.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE RESULTED IN RECOMMENDATIONS

1. The CBYC chief instructor should have recognised that the two 17 year old coaches were not sufficiently trained or experienced to safely operate power-driven craft at night without close supervision. He should also have been aware that the CHA had published a 'common sense regulation' which directed that they should not operate high-powered vessels such as the club RIBs in Cardiff Bay at any time. [2.2.3]
2. The guidance issued by the RYA to its training centres following the Plas Menai accident (**Annex E**) included advice that boat passengers should, where appropriate, be provided with a seat. CBYC should ensure that the recommended maximum capacity of its boats as marked on the builder's plate is not exceeded. It should also provide guidance on the use of its boats for the carriage of persons in excess of the available seating. [2.7]
3. CBYC should review its system for the care and maintenance of club boats to ensure they are always in a good and serviceable condition. [2.10]

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION ALSO LEADING TO RECOMMENDATIONS

1. The CBYC chief instructor reprimanded the drivers involved in thrill seeking behaviour but did not take the opportunity to review their suitability to be in charge of the boats. [2.4].
2. With no designated person appointed, the duty holder is not complying with the requirements of the PMSC and is denying itself a source of independent assurance and advice. Cardiff City Council should consider the appointment of a designated person as soon as is practicable. [2.12.2]
3. The lack of knowledge of essential marine safety information demonstrated by the chief instructor and other senior members of CBYC, a major stakeholder, suggests that there is insufficient understanding of the CHA's roles and responsibilities among some bay users. CHA should take further measures to clarify its regulations and to raise its profile both afloat and ashore to ensure that harbour users understand and respect the role of the statutory harbour authority in maintaining a safe marine environment in Cardiff Bay. [2.12.3]
4. It is regrettable that the lessons from a previous, similar accident were not apparently recognised or understood by senior members of CBYC. The club should ensure that the safety lessons from previous accidents and RYA guidance, particularly in relation to risk assessments, are disseminated to, and properly understood and put into practice by all its members. [2.13]

3.3 SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION WHICH HAVE BEEN ADDRESSED OR HAVE NOT RESULTED IN RECOMMENDATIONS

1. There is no evidence to suggest that the race training, which took place during the day, was not conducted safely. However, the fact that IOCA was not involved in assessing the risks involved in transporting the children across Cardiff Bay at night was a significant omission in the planning of this event. [2.2.1]
2. This was the first occasion on which, as part of a sailing event based at Cardiff Bay Yacht Club, participants were to be transported across the bay at night. At no stage was the planning for this part of the event given the consideration required for such a potentially hazardous passage. [2.2.2]
3. Organisers of events which require the use of volunteers should ensure that the volunteers are provided with clear guidelines as to their responsibilities to raise any concerns they have about the conduct of activities, and the means by which they should do so. [2.3]
4. Good local knowledge of a particular area does not obviate the fundamental requirement to comply with the COLREGS. That the CBYC chief instructor was content to allow high speed power-driven craft to operate at night, without navigation lights, demonstrates either a basic lack of knowledge and understanding of the COLREGS, or a failure to recognise the risks associated with four high speed RIBs crossing the bay in darkness in an uncoordinated manner. [2.5]
5. The boats involved in the collision were being driven by drivers who had not achieved a relevant qualification or gained experience in night navigation. They were being driven at speed and without lights, in an area where flotsam was a known hazard and with passengers sitting on the buoyancy tubes. Proper consideration of the night passage across the bay could have identified these hazards, and appropriate control measures, including transiting at a safe speed, could have been established. [2.5, 2.6, 2.7]
6. The transportation of the participants across Cardiff Bay at night should have been properly assessed in advance of the event. The supply of suitable lifejackets, fitted with lights and whistles, for these journeys should have been considered as an essential control measure. [2.8]
7. To avoid recurrence, the immediate care and treatment offered to children involved in high impact accidents should be considered as part of the event risk assessment. The requirement to seek prompt medical attention should be included in the event's contingency measures. [2.9]
8. The carriage of safety equipment, maintained in a good condition and stowed in appropriate containers is a prerequisite for the operation of a safety boat. The fact that this equipment was not available for the IOCA training week indicates that the club should review its safety management system in relation to the operation and maintenance of its boats. [2.10.2]
9. CBYC should review the provision and use of radios, with the aim of ensuring that all its water-borne activities have appropriate means of raising the alarm and of communicating during emergency situations. [2.10.3]

10. The RYA should ensure its inspectors complete annual inspection checklists proficiently, highlighting items requiring attention together with the responsibility and time scale for the recommended remedial action. [2.11]
11. The lack of any formal review of the authority's safety management system for almost 9 years is contrary to the requirements of the PMSC, and the duty holder should take action to ensure that this situation is not repeated in the future. [2.12.1]

SECTION 4 - ACTION TAKEN

4.1 THE INTERNATIONAL OPTIMIST CLASS ASSOCIATION

IOCA has:

- Completed a review of the circumstances of this accident and undertaken to ensure that, in the future, this type of event will be planned and assessed to the same high standard as its structured training and racing events.
- Ensured that safety grab bags will be available for all safety boats used in IOCA events.
- Commenced a review of actions to be taken in the event of serious, or potentially serious, accidents including high speed collisions. This review will include consultation with qualified medical advisors with a view to producing appropriate guidelines regarding removal of injured persons to the nearest Accident & Emergency department.

4.2 THE ROYAL YACHTING ASSOCIATION

RYA has:

- Undertaken a re-inspection of the CBYC training centre; and, remedial training for the chief instructor with regard to safety standards and management.
- Provided refresher training for all RYA inspectors in Wales with emphasis on the requirement for specific dates and actions as part of each action plan.
- Reviewed the lessons learnt from the accident with the chief instructor.
- Developed a “lessons learnt” document which has been presented at RYA instructor conferences and promulgated to all RYA instructors via newsletters.

4.3 CARDIFF HARBOUR AUTHORITY

CHA has:

- Carried out its own investigation, which identified a number of recommendations. This report has been published on its website, and the main recommendations have been identified to stakeholders directly.
- Appointed consultants to assist in development of the navigational safety management system.
- Established an internal Navigational Management Team with representation from all departments having a marine function within the Authority to provide a broader focus for navigational management.
- Published an online incident report form and revised its website to ensure consistency of information with its Bay Users Guide.

- Amended the agenda and attendance of stakeholders at meetings to improve communications.
- Developed safety objectives and measures to be included in its business plan for 2011/12.
- Provisionally appointed a designated person subject to confirmation by Cardiff City Council.

Additionally, Cardiff Harbour Authority intends to:

- Undertake a thorough review of its Navigational Risk Assessment by December 2011.

4.4 CARDIFF BAY YACHT CLUB

CBYC has:

- Established a committee to review its risk assessments for training and all associated activities including major events and other activities run by the club.
- Appointed staff with risk assessment experience to manage the sailing school activities associated with the club.
- Reviewed and revised the internal incident reporting system to ensure all incidents are reported in a timely manner to club officers.
- Introduced procedures for:
 - reporting accidents to the Cardiff Harbour Authority and the MAIB as appropriate
 - ensuring the club's boats are not operated during the hours of darkness unless properly equipped
 - ensuring that safety equipment grab bags and VHF radios are carried on club boats
 - preventing persons under 18 years of age from taking charge of club RIBs.

SECTION 5 - RECOMMENDATIONS

Cardiff Bay Yacht Club is recommended to:

2011/130 Review its safety management system to ensure that:

- Effective risk assessments are carried out for all activities hosted by the club.
- Lessons from previous accidents, and RYA guidance where appropriate, are disseminated.
- Its boats are maintained to a high standard.
- Procedures are introduced to ensure the competence and experience of drivers of club boats is appropriate for all events.
- The guidance and regulations issued by the Cardiff Harbour Authority are followed and complied with at all times.
- The recommended maximum capacity of its boats, as marked on the builder's plate, is not exceeded, and that guidance is provided on the use of its boats for the carriage of persons in excess of the available seating.

The **Cardiff Harbour Authority** is recommended to:

2011/131 Confirm the appointment a designated person, as required by the Port Marine Safety Code.

2011/132 Take measures to raise the profile of its role as the statutory harbour authority with its stakeholders.

**Marine Accident Investigation Branch
October 2011**

Safety recommendations shall in no case create a presumption of blame or liability

RYA 2010 inspection action plan of Cardiff Bay Yacht Club's training centre

INSERT CARD BEFORE USE



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RYA TRAINING CENTRE INSPECTION ACTION PLAN

Name of Training Centre CARDIFF BAY YACHT CLUB

Date of Inspection 15/SEPT/10 page 1 of 1

Action/No Action required (please delete as appropriate)

Items requiring attention	Action required and by whom	To be completed by
INSTRUCTORS CERIS	INSTRUCTIONAL STAFF A RECORD OF QUALIFICATIONS TO BE KEPT IN OFFICE WILL BE PUT IN PLACE	NEAT INSPECTION
PB EQUIPMENT	THE CRAFT WHEN OPERATING IN THE BAY DO NOT CARRY ALL EQUIPMENT ON CHECK LISTS BUT THEY DO WHEN OUTSIDE THE BAY	
CUSTOMER FEEDBACK	YES FOR PB COURSES - NEEDS TO BE REINSTATED AGAIN FOR DINGHY COURSES	ASAP
INSPECTION REPORT	KEEP BOAT REGISTRATION NOT REQUIRED AT THIS TIME	

15/9/10
14/9/10

SIGNATURE [Redacted] NAME [Redacted] DATE 15/9/10
Inspector

Declaration by Principal/Chief Instructor
I have read this report and agree to carry out the actions indicated by the dates shown

SIGNATURE [Redacted] NAME [Redacted] DATE 15/9/10
Principal/Chief Instructor

White copy to Centre

Yellow copy to RYA Training

Blue copy to RYA Training

Extract from guidance notes for RYA training centres in the UK

- Dinghy, Keelboat & Multihull
- Windsurfing
- Powerboating
- Personal Watercraft

Guidance Notes

For

RYA Training Centres in the UK

January 2011



Royal Yachting Association

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3. Mast bases must operate correctly and be well maintained. The downhaul should be free to move and cleat effectively. Any quick-release system must operate correctly and be well maintained
 4. Booms should have a secure clamp that does not slip while in use, yet may easily be adjusted to suit the height of the user. The boom must be the correct length for the sail and the grip surface must be in overall good condition
 5. An uphaul must be fitted on all rigs, for beginner rigs a thick rope with elastic return (attached approx 1/3 from the bottom) should be used. Elasticated cords can be used for more advanced rigs
 6. The downhaul and outhaul ropes should be in a sound, unfrayed condition and be of a suitable diameter for the fittings being used.
 7. Centres offering tuition beyond Start Windsurfing should ensure harness lines in sound condition are fitted to booms.
- D** The board and rig joint (UJ) must be in good condition, free from wear and should be immediately replaced should any signs of deterioration be apparent. Operation of any quick-release system should be capable of being performed by the student whilst afloat.
- E** Recognition for junior courses requires that junior boards, with suitable fins and junior rigs in a variety of sizes are available in sufficient quantities. Suitable rigging sticks should be provided.
- F** Boards and rigs should be stored in a secure and safe manner and should be easily accessible for instructors and students. Instructors should be trained to lift and carry equipment and students should be supervised as necessary.
- G** Basic simulators should be available. Simulators must be in a good state of repair, stable, low and well damped. The board should be representative of the type used afloat, have a good non-slip surface and be securely attached to the simulator. The simulator should be positioned so that students will not injure themselves or others should they fall off.
- H** A static simulator for teaching the coaching formula, harness and footstraps must be available at all centres wishing to be recognised for intermediate levels and above. The board should be representative of the type used afloat, positioned securely and depending on design a sail-less rig should be attached. Care should be taken to ensure that the device representing the pull of the wind is safe and in good condition. This device should also be adjustable for different wind strengths and student size. The simulator should be positioned so that students will not injure themselves or others should they fall off.
- I** A range of harnesses in suitable sizes must be made available by centres offering tuition above Start Windsurfing.
- J** T15 Clubs:
1. Team 15 clubs can only operate at RYA Training Centres under the supervision of an SI.
 2. Team 15 sessions should be led by a Windsurfing Racing Instructor, where a Racing Instructor is not available a qualified RYA windsurfing instructor may deputise.
 3. The safety boat ratios in Safety L should be observed.

Powerboat/PW Fleet Checklist

- A** Ideally both planing and displacement powerboats should be available.
- B/C** 1. Safety boats operating at coastal centres should carry as a minimum the following;
- Paddles or Oars (or appropriate alternative propulsion)
 - Bucket or Bailer
 - Bridle secured to suitable strong points
 - Towline
 - Spare starting cord and tool kit
 - Survival bag or thermal protective aid
 - Waterproof First Aid Kit containing (minimum) 2 large wound dressings, 2 medium wound dressings and triangular bandages.
 - Anchor and chain or warp as appropriate to the area

Distress flares – 2 orange smoke and 2 pinpoint red, or 2 day/night flares
Sharp knife, preferably serrated
Spare kill cord (except heavy displacement craft)

Boats used for Powerboat Level 2 courses should in addition to the above carry;
GPS, either fixed or handheld
Fixed steering compass (coastal sites only)

Boats used for Intermediate and Advanced courses should in addition to all the above carry:
Navigation lights
VHF radio, either fixed or handheld
Echo sounder
Torch
Laminated charts
Tide tables

2. Personal Watercraft equipment;
Fire extinguisher
Flares minimum 1 pinpoint red and 2 orange smoke
Torch
Knife with serrated edge
Tow rope
Small first aid kit
Small grapnel anchor
Tool kit and spares

PW's accompanied by a suitably equipped support boat do not need to carry the above.

3. The Intermediate and Advanced Powerboat courses can only be run at coastal centres using planing boats. Centres are advised to use a buddy system as far as possible. Centres applying for Intermediate and Advanced courses should submit a detailed plan comprising their intended course program, a chart defining their intended training area and a detailed description of the salient teaching points. In addition they should submit an emergency procedures plan for the hours of darkness.
4. Normally only schools with advanced powerboat recognition may offer the intermediate course.
5. The centre must ensure that all persons participating in Advanced courses wear a 150 Newton Lifejacket as minimum with a DoT approved light.
6. Guidance for the centres wishing to run the advanced course is available in the handbook G19.
7. Where the PWC or Powerboat used for tuition is not owned by the school, it should be available for inspection along with a written agreement for its use.

D All powerboats in use should be seaworthy, in good condition and fully operational:

1. Engines should be serviced on a regular basis and be in good order.
2. Outboard engines should be securely mounted.
3. Fuel tank and battery fixings should be secure and adequate.

E Except in the case of heavy displacement craft, where kill cords may not be practical, kill cords must be fully functional and must be fitted and used at all times when under way. A spare kill cord should be carried for emergency use.

F Centres wishing to run the RYA Safety Boat course should have a good variety of sailing and windsurfing craft available for use. It is unlikely that centres not attached to dinghy sailing/windsurfing clubs or centres will be recognised for this course.

G The centre should ensure that trolleys/trailers are suitable for the craft and in a serviceable condition. The trolleys should enable the craft to be safely launched, recovered and manoeuvred on land without risk of injury to the users.

- H** Centres offering powerboat tuition to 8 – 11 year old students must have two effective kill cords fitted, one for the student and one for the instructor.

ADMINISTRATION

Administration is important to the safe, efficient running of a centre. Centres should ensure that administration is conducted efficiently. The administration that the RYA requires is to protect the centre, its staff and its users. Documentation should be brief, clear and representative of what actually happens in the centre to ensure that all activity is both safe and enjoyable.

- A** The Principal is responsible for ensuring that adequate insurance covering all of its training activities is in full force and effect while the centre is recognised by the RYA. All the centres activities should be covered.

The Principal will be required to sign a self-declaration, stating that they are fully aware of their responsibilities and that they have sought professional advice to assure themselves that they hold adequate cover.

Should the RTC not have adequate insurance the RYA reserves the right to suspend or withdraw recognition with immediate effect.

- B** Booking forms should include information about any pre-course requirements and emergency contacts. If the centre is aware that a student has a medical condition, they should seek further advice from the student.

Centres should hold contact details and records of correspondence with their students for a minimum of 12 months.

- C** The centre should have a written record of the qualifications of all instructors, which should be available for inspection. There should be a system for checking qualifications of instructors.

- D** Centres working with children or young people under 18 should have a child protection policy and procedures in place. See the RYA website for more information (under "Working with Us")

- E** It is the responsibility of the Principal to obtain references for key instructors working with children.

- F** An Accident Book must be used. It should be reviewed regularly and action taken to prevent repetition of injuries. In the case of a major serious incident or near miss the Principal should contact the RYA, who can provide advice and assistance, as well as disseminating any lessons learned.

- G** A record of near misses should be kept. These are events which could have caused an accident or injury. The record should be similar in content to an accident book entry. Such incidents should be reviewed regularly and lessons learned recorded with actions taken to avoid reoccurrence.

- H** All instructors should undergo induction training in the running of the centre and should sign that they have read and understood the operating procedures.

- I** A system for receiving and reviewing customer feedback and complaints should be in place. Every effort should be made by the Principal/Chief Instructor to resolve any complaints as quickly as possible. Receipt by the RYA of an unreasonable number of substantiated complaints against a school may result in suspension/withdrawal of the school's recognition.

- J** The advertising, brochures, booking forms, joining instructions etc. should be clear and accurate. They must not give any mis-representation, either by implication or omission, that the facilities, services and courses offered, qualifications of instructors or level of RYA recognition differ from those implicit in the recognition already granted. The centre must not use the RYA's trademarks to advertise any activities other than the specific RYA training for which it is recognised.

Cardiff Harbour Authority Byelaws 11 and 12

Collision - Reporting to the Authority

11. The Master of any Vessel or user of Pleasure Craft or Owner of a Mooring involved in a collision causing any damage with any other Vessel or Pleasure Craft or structure in Cardiff Harbour shall report the incident to the Harbour Master as soon as reasonably practicable.
12. The Master of a Vessel or user of Pleasure Craft which has collided with or cut adrift a navigation mark or buoy or which by reason of accident, fire, defect or otherwise is in such condition as to affect its safe navigation or to give rise to danger to other Vessels or Pleasure Craft shall report to the Harbour Master as soon as reasonably practicable and provide in writing full details of such incidents.

Cardiff Harbour Authority Local Notice to Mariners No 34 of 2010

Visibility of low freeboard craft navigating in Cardiff Bay and the rivers Taff and Ely

No: 34 of 2010.

As we approach winter, and the increased duration of darkness each day, use of the rivers by low freeboard craft (primarily rowers and paddlers) in low light conditions will increase. As in previous years, low freeboard craft are to show the following lights when navigating on the rivers Taff and Ely when appropriate:

At the bow, visible in the forward 180° arc, a flashing, high intensity (strobe type) white light.

At the stern, visible in the sternward 180° arc, a fixed, high intensity white light.

Mariners should note that these **do not correspond** with the requirements given in Colregs for craft powered by oars, but it is the view of the Harbour Authority that these light characteristics make low freeboard vessels more visible, and therefore reduce the chance of collision.

As always, mariners are requested to remain vigilant for low freeboard craft when navigating in the rivers, to pass them at slow speed and to be aware of wash.

Rowers and paddlers should note that low freeboard vessels are **prohibited** from navigating in the main Bay in poor visibility or in darkness.

ID: 232 Revised: 5/10/2010

Guidance for RYA training centres offering powerboating activity
other than RYA recognised tuition

**Guidance for RYA Training Centres
offering Powerboating activity other
than RYA recognised tuition**

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Introduction

In addition to running recognised RYA Powerboat courses, many multi-discipline activity centres offer other forms of powerboat activity. It can be delivered in many ways, as a site seeing journey, a river study or just a ride on a boat. Some RTCs also provide introductory lessons to promote participation in future RYA courses.

The Inland Waters Small Passenger Boat Code gives safety advice to operators of small commercial vessels (carrying up to 12 passengers) using the UK's inland and estuarial waters. The Code is not regulatory but gives best practice guidelines. In addition to the advice given in the Code there is also guidance on Powerboat introductory lessons.

This summary covers the following key areas;

1. Crew Qualifications
2. Crew / passenger ratios
3. Seating, comfort and safety
4. Communications
5. Weather limitations
6. Safety equipment
7. Introductory lessons.

Crew Qualification

Centre Principals should satisfy themselves that the person in charge of the vessel is competent both to handle the vessel and to deal confidently with passengers.

It is recommended that the skipper holds RYA Powerboat Level Two.

It is the responsibility of the Centre Principal to ensure that the skipper and, where necessary, the crew of the vessel have, in addition to any qualifications, recent and relevant experience of the type and size of vessel.

In some cases, vessels will operate in higher risk areas –e.g. through locks and tunnels- and also have higher risk passengers on board. In these instances it is recommended that an additional risk assessment be carried out. The Centre Principal should ensure that there are sufficient persons on board with relevant experience to cope in the case of an emergency.

Crew / Passenger ratio

The maximum number of passengers carried must never exceed 12. More than twelve and the skipper will require a National Boatmaster licence issued by the MCA.

The Centre Principal should determine the maximum number of persons that can be safely carried on the vessel. In many cases this will be far less than the maximum 12 allowed.

Seating, comfort and safety

Where appropriate, passengers should be provided with a seat. In the case of a RIB, where passengers sit on the inflatable collar all passengers should have suitable hand holds.

Operate at a safe speed. Do not operate the vessel in a reckless manner in order to provide a “thrill ride” experience.

Communications

Effective communication is essential. If using marine VHF radio check the effective range from the centre to vessels on the limits of your operating area.

Many Centres use their own private channels, however, in times of emergency, when the rescue services are involved change to channel 16 so that everyone can communicate.

Weather limitations

When planning a trip on a given day always take into account the weather forecast and make an assessment of the conditions that maybe encountered. Choose a safe operating area accordingly.

If the conditions are less than favourable consider reducing passenger numbers and limiting speed.

Safety Equipment

The vessel should be equipped to the standards laid down in the current guidance notes for centre inspection appropriate to the operating area.

Powerboat Introductory lessons

Centres that offer short introductory sessions to encourage future participation in certificated courses, (e.g. taster sessions as part of multi-activity courses) may operate at a student to instructor ratio greater than that specified for certificated courses, providing the boats are not overloaded and taking into account the type of boat and conditions. The exact ratio is at the discretion of the Centre Principal, with due consideration to the RYA guidelines. The Centre Principal should be aware that increasing ratios for all such sessions may not be appropriate.

Powerboat Introductory lessons should be supervised by a qualified RYA Powerboat Instructor.

The Inland Waters Small Passenger Boat Code is available via the MCA website www.mcga.gov.uk under Guidance and Regulations and then Inland Waterways.

