

Report on the investigation of the capsizing of
Plas Menai RIB 6
while undertaking unauthorised RIB riding activity
near Caernarfon, Wales, 1 July 2008,
resulting in one injured student

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The United Kingdom Merchant Shipping
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Regulations 2005 – Regulation 5:

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CONTENTS

	Page
GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS	
SYNOPSIS	1
SECTION 1 - FACTUAL INFORMATION	2
1.1 Particulars of Plas Menai <i>Rib</i> 6 and accident	2
1.2 Plas Menai – The National Watersports Centre for Wales	3
1.2.1 Background	3
1.3 Environmental conditions pre-departure	3
1.4 Narrative	4
1.4.1 Shore-based preparations and the voyage to Abermenai Point	4
1.4.2 Preparation	4
1.4.3 Outward trip	6
1.4.4 Events leading up to the capsiz	7
1.4.5 Capsize and inversion	8
1.4.6 Initial rescue	9
1.4.7 Rescue service alerting	10
1.4.8 Subsequent events	10
1.4.9 Environmental conditions - accident location	11
1.5 Clients – the school party	12
1.5.1 School	12
1.5.2 Students	12
1.5.3 Adult Volunteer Helper	12
1.5.4 School teachers	12
1.5.5 Student casualty	12
1.6 Plas Menai personnel, including freelance instructors	13
1.6.1 Duty officer	13
1.6.2 Instructors in charge	13
1.6.3 Senior instructor in charge	13
1.6.4 Junior instructor in charge	13
1.6.5 Assistant instructor	14
1.7 Centre requirements – instructor qualifications	14
1.8 Communications – VHF radio and mobile telephone	14
1.8.1 Hand-held VHF radios	14
1.8.2 VHF radio sets in Plas Menai RIBs	15
1.8.3 VHF radio base station at Plas Menai Centre	15
1.8.4 VHF radio coverage at Abermenai Point	15
1.8.5 Emergency VHF radio calls	16
1.8.6 Mobile telephones	16
1.9 Personal protective clothing and buoyancy aids	16
1.9.1 Protective clothing	16
1.9.2 Buoyancy aids	16
1.10 Boats and equipment	17
1.10.1 Boat coding/certification	17
1.10.2 Plas Menai <i>RIB</i> 6	17

1.10.3 Plas Menai <i>RIB</i> 5	18
1.10.4 Plas Menai <i>RIB</i> 7	18
1.10.5 Safety equipment	18
1.11 Electronic data evidence	18
1.11.1 <i>RIB</i> 6 - GPS	18
1.11.2 <i>RIB</i> 6 - Outboard motor	18
1.12 Categorisation of waters	19
1.12.1 MCA categorisation of waters	19
1.12.2 Plas Menai categorisation of waters	19
1.13 Plas Menai safety management system	19
1.13.1 Centre management, inspection and approvals	19
1.13.2 Safety and operations handbook	20
1.13.3 Authorised, scheduled activity and “journeying”	20
1.13.4 Group operating areas – the “away day” form	21
1.14 Centre regulation, licensing and inspection	21
1.14.1 Regulation	21
1.14.2 Adventure Activities Licensing Service	21
1.14.3 Royal Yachting Association	22
1.14.4 RYA inspection of Plas Menai Centre	22
1.14.5 Caernarfon Harbour Trust	22
SECTION 2 - ANALYSIS	23
2.1 Aim	23
2.2 Fatigue	23
2.3 Action and conduct of instructors - Summary	23
2.4 Briefing and mentoring of the AI	23
2.5 Environmental conditions and operating areas	24
2.6 Programmed activity and alternative plans	24
2.7 VHF radio communications	25
2.7.1 Emergency calls by VHF radio	25
2.7.2 Limitations of hand-held VHF radios	25
2.7.3 Private VHF channels	26
2.7.4 Communication with the evening duty officer	26
2.8 Mobile telephone communications	26
2.8.1 Inappropriate use of mobile telephones in emergency situations	26
2.8.2 Appropriate use of mobile telephones	27
2.9 Emergency response	27
2.10 Personal protective clothing and buoyancy aids	28
2.11 RIBs at Plas Menai	28
2.11.1 RIB suitability for Plas Menai operations	28
2.11.2 RIBs – passenger seating arrangements	29
2.11.3 <i>RIB</i> 6 – Stance of the helm	29
2.12 “Journeying” - Centre regulation, licensing and inspection	29

SECTION 3 - CONCLUSIONS	31
3.1 Safety issues directly contributing to the accident which have resulted in recommendations	31
3.2 Other safety issues identified during the investigation also leading to recommendations	31
3.3 Safety issues identified during the investigation which have not resulted in recommendations but have been addressed	32
SECTION 4 - ACTION TAKEN	33
4.1 Plas Menai Centre	33
4.2 The Royal Yachting Association	33
SECTION 5 RECOMMENDATIONS	34

List of Figures

Cover	<i>RIB 6</i>
Figure 1	Plas Menai Centre
Figure 2	Extract of chart BA 1970 showing Plas Menai Centre and Menai Strait
Figure 3	<i>RIB 5 and RIB 6</i>
Figure 4	Illustration of <i>RIB 6</i> with driver standing at side of console
Figure 5	<i>RIB 6</i> seen from bow

Annexes

Annex 1	Guidance for RYA Training Centres offering Powerboating activity other than RYA recognised tuition
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GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS

AALS	-	Adventure Activities Licensing Service
AI	-	Assistant Instructor
AVH	-	Adult Volunteer Helper
BCU	-	British Canoe Union
BST	-	British Summer Time (UTC + 1)
CE	-	Conformité Européenne - French phrase meaning European Conformity
CRT	-	Coast Rescue Team – Part of HM Coastguard
DSC	-	Digital Selective Calling
GPS	-	Global Positioning System
GRP	-	Glass Reinforced Plastic
HM	-	Her Majesty's (Coastguard)
HP	-	Horse power
HSE	-	Health and Safety Executive
ILB	-	Inshore Lifeboat – RNLI
JiC	-	Junior Instructor in Charge
Journeying	-	A term used to describe the use of powerboats as a means of transport from A to B, rather than as an instructional tool used in boat training operations
kg	-	kilogram
kW	-	kiloWatt
m	-	metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
mm	-	millimetre
MSN	-	Merchant Shipping Notice
N	-	Newton
nm	-	Nautical miles
RCD	-	Recreational Craft Directive

RIB	-	Rigid-hulled Inflatable Boat
RNLI	-	Royal National Lifeboat Institution
RYA	-	Royal Yachting Association
SAR	-	Search and Rescue
SliC	-	Senior Instructor in Charge
SMS	-	Safety Management System
TQS	-	Tourism Quality Services
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency
W	-	Watt

Times: All times used in this report are BST (local) unless otherwise stated



Plas Menai Rib 6



SYNOPSIS

During an unauthorised deviation from a planned powerboat trip for a party of 14/15 year old school boys, the coxswain of a rigid-hulled inflatable boat (RIB) strayed away from the other boats in her group and into rough water. There, she lost control of her RIB and it capsized, resulting in eight people entering the water, some beneath the inverted boat. All managed to get clear of the upturned hull and were quickly rescued by another RIB. One passenger was injured and subsequently air-lifted to hospital for medical treatment.

A school party staying at the Plas Menai National Watersports Centre had set out on an authorised powerboat journey within the Menai Strait to go kite flying. Three RIBs carried the group, each driven by a qualified professional instructor. However, the assistant instructor (AI) helming *RIB 6*, the RIB that capsized, was much less experienced than the other two. When the party arrived at their destination, the weather was unfavourable for kite flying and the two experienced instructors agreed an ad-hoc alternative plan. This involved leaving the Menai Strait to give their passengers a more interesting and exciting trip in the outer channel. They did not adequately brief the AI, or fully consider her inexperience. They did not seek permission from the course supervisor to deviate from the approved plan, as required by Plas Menai procedures, and their revised plan involved an element of “thrill riding” which was not an approved activity at the centre.

Initially all was well, but the AI was allowed to stray from the others and take *RIB 6* into particularly rough waters. Realising that she was heading in to danger, the AI turned the RIB, but lost control and it capsized. Fortunately all on board escaped without serious injury, and were quickly rescued by *RIB 5*.

The two experienced instructors decided to recover *RIB 6*, and so landed most of the students, including those rescued from the water, ashore on a nearby beach. The centre was not informed of the accident, but the coastguard was contacted by mobile telephone with a request for the local RNLI lifeboat to assist recovering the upturned RIB. Meanwhile, on the beach, one student’s condition deteriorated and he required helicopter evacuation to hospital. The other students were unhurt, and were later returned to the centre.

The investigation identified a number of safety issues including the planning, control, and leadership of the activity, and communications shortcomings.

The Royal Yachting Association (RYA) has provided guidance to its members on the conduct of peripheral waterborne activities. Plas Menai centre has taken action to remedy most of the shortcomings identified in this report, and a recommendation has been made to the centre to review its communications infrastructure.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF PLAS MENAI RIB 6 AND ACCIDENT

Vessel details

Owner and Manager : Plas Menai, the National Watersports Centre for Wales

Port of registry : Not registered

Flag : UK

Built : 2003, Tornado Boats International Ltd, UK

Type : Rigid Inflatable Boat (RIB)

Construction : GRP hull, inflatable tubes

Dimensions : Length overall 5.8 metres, beam 2.5 metres

Engine power and type : 115 HP (85.78kW) 4-stroke outboard motor

Design Details : RCD design Category C. CE marked:
*Maximum 10 persons. Maximum weight permitted to be carried (engine + persons + luggage/stores/effects) = 1320 kg.
Maximum permitted engine power 150 HP*

Maximum service speed : Approximately 35 knots

Accident details

Time and date : Approximately 2020 hrs on 1 July 2008

Location of incident : 53° 07.27N, 04° 20.85W
Near the Mussel Bank buoy, at the Caernarfon Bar entrance to the Menai Strait, North Wales

Persons on board : Coxswain + 7 passengers (all under 18 years)

Injuries/fatalities : One passenger struck by RIB during capsize and consequently suffered shock, mild whiplash, mild hypothermia and an asthma attack.

Damage : Limited damage as a result of the capsize and consequent immersion

1.2 PLAS MENAI – THE NATIONAL WATERSPORTS CENTRE FOR WALES

1.2.1 Background

The Plas Menai centre is located on the mainland side of the Menai Strait, overlooking Anglesey near Caernarfon in North Wales (**Figure 1**).

Figure 1



Plas Menai Centre

Established 25 years ago, Plas Menai is a purpose-built centre, owned and operated by the Sports Council for Wales. It includes residential accommodation, together with very extensive watersports facilities. The centre conducts a wide variety of activities and training including sailing, canoeing, windsurfing and powerboating.

The accident involved a party of students from a school in the west of England, who were attending a 1 week watersports activity course at the centre.

1.3 ENVIRONMENTAL CONDITIONS PRE-DEPARTURE

The centre log recorded the weather forecast for the day as:

Wind southerly force 5-6 possibly 7 earlier, but decreasing. Rain or showers.

High tide at Caernarfon was predicted to occur at 2119, height 4.8m at approximately 80% of spring tide. The tidal flow was into the Menai Strait, at about 2 knots from the south-west. The wind with tide conditions at the time of the accident resulted in smoother sea conditions than those experienced during the later stages of the recovery operation once the tide had started to ebb.

1.4 NARRATIVE

1.4.1 Shore-based preparations and the voyage to Abermenai Point

At 0845 on 1 July 2008 the centre's daily staff meeting was held. During the meeting the daily activity programme was discussed and agreed by the course supervisor and centre instructors, and instructors were allocated to tasks.

The planned evening activity for the school group was a trip to Abermenai Point, using the centre's powerboats, for kite flying on the beach. The plan required three boats, so three instructors were allocated to the activity, one to helm each of the boats.

Of the instructors allocated to the trip, the senior instructor-in-charge (SliC) and the assistant instructor (AI) were present at the staff meeting, but the junior instructor in charge (JliC) was not. This was the first time that the SliC and AI had worked together, but the SliC was aware that the AI was young and relatively inexperienced. The SliC and JliC had worked together many times before.

The authorised location for the activity was Caernarfon/Abermenai, inside the south-west end of the Menai Strait. The journey involved travelling along the Menai Strait towards Caernarfon and then onwards to the sheltered sandy beach at Abermenai Point, a distance of about 4nm, in relatively smooth sheltered waters. No alternative activity or location was planned (**Figure 2**).

The boats originally allocated were two fast RIBs and a slower workboat. As a result of discussions about the suitability of the workboat, and the perceived expectations of the school group, the course supervisor and SliC allocated a third RIB instead of the workboat in order to give the students a more interesting and exciting activity (**Figure 3**).

The RIBs were to disembark the school party directly on to the beach so as to allow them to fly kites. Once the activity was complete, the RIBs were to transport them back to the centre. All of these details were documented.

1.4.2 Preparation

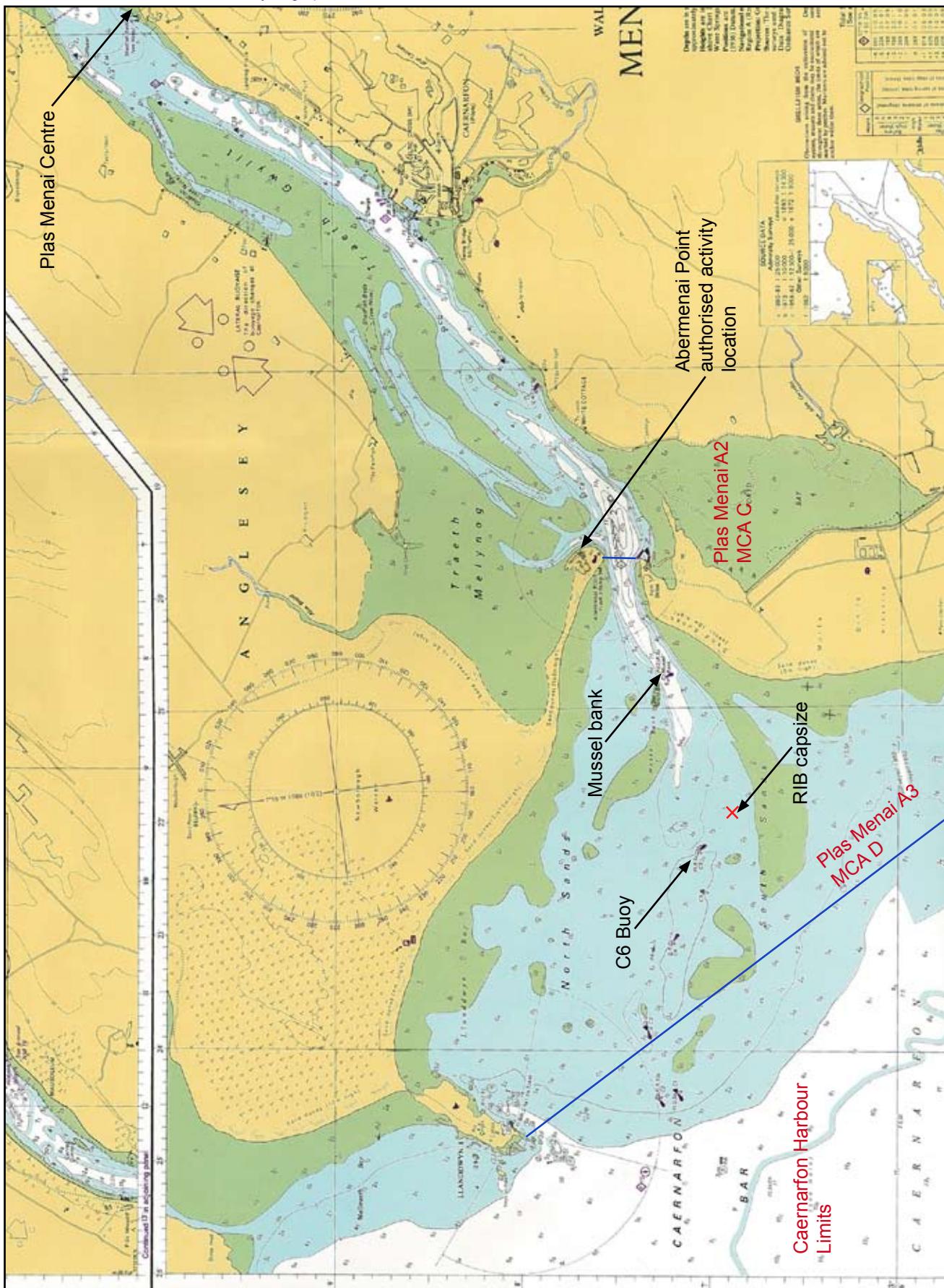
At approximately 1640, the SliC met with the course supervisor, the evening activity programme was re-confirmed, and the SliC then collected the kites from the store. The RIBs were allocated as follows:

RIB 5: SliC, Adult Volunteer Helper (AVH) and 7 students,

RIB 6: AI and 7 students,

RIB 7: JliC and 6 students.

Figure 2



Extract of chart BA 1970 showing Plas Menai Centre and Menai Strait

Figure 3



RIB 5 and RIB 6

At about 1700 the JIIC arrived at the centre and all three instructors met to check and prepare their boats and equipment. They launched two RIBs, the third was already on the water, and the AI collected a spare can of petrol and placed it on board *RIB 6*.

At 1930 the centre reception desk closed for the day and the nominated night duty officer took over the VHF radio and telephone watch.

1.4.3 Outward trip

At about 1900, the students arrived and boarded the boats, where each instructor gave them a short pre-departure briefing. The majority of the passengers in each RIB were seated on the tubes and, as the instructors were concerned about losing passengers overboard, they took some time to explain exactly how and where the students should sit and hold on. The AI decided to use the Global Positioning System (GPS) chart plotter fitted to *RIB 6* to provide additional interest for her passengers.

At about 1915, the three RIBs departed Plas Menai for Abermenai. The local coastguard was not notified of their departure or intentions, but this was in accordance with Plas Menai procedures. The two RIBs driven by the SIC and JIIC arrived at Abermenai about 1930, and they waited just off the beach, where they were soon joined by the RIB being helmed by the AI.

As the RIBs arrived at Abermenai it was raining heavily and there was very little wind. The SLiC and JLiC held a shouted discussion across the water between their boats, and together decided that kite flying was not possible due to the weather conditions. They then discussed their options and developed a revised plan. Their intention was to provide the students with an interesting and exciting alternative activity, and they decided that an extended powerboat trip would be a viable option. Due to the prevailing weather and tide conditions, they considered that it would be safe to continue beyond Abermenai Point, but that the extent of any additional excursion would be limited by the conditions they encountered once beyond the point. The SLiC planned to head for the Mussel Bank buoy initially, and then continue to buoy C6 if conditions allowed. The SLiC shouted the improvised plan across to the AI, and told her to stay close.

The SLiC decided not to contact the centre to notify the duty officer of his intentions. He knew that this was contrary to the centre's policy, but felt comfortable with his decision as he had discussed the plan with the very experienced JLiC accompanying him, and had the two other RIBs with him to provide support in case of difficulties. He also knew that the duty officer at the centre was a junior member of staff who was not qualified or authorised to approve the change of plan that he was intending.

Before departing Abermenai, the three instructors explained their new plan to their passengers, who had already overheard the shouted exchanges between the boats. Realising that the ride was going to get rougher, some of the students later admitted that they had felt slightly apprehensive. However, nothing was said to the instructors at that time, and the instructors' impression was that the students were happy and were having a good time.

1.4.4 Events leading up to the capsiz

At about 1935, the three RIBs left Abermenai together. As they headed towards the Mussel Bank buoy, sea conditions in the deepwater channel were acceptable; there was a smooth rolling swell of about 1m - 1.2m, and all RIBs coped easily. On their port side as they headed out, they could all see larger waves breaking in the shallow waters of the South Sands. The instructors estimated these waves to be about 1.5m in height. As the conditions in the channel were not causing the RIBs any problems, the SLiC ventured further out, making for buoy C6 where he planned to turn and head back for the Mussel Bank, so forming a circuit between the two buoys. The RIBs were moving at speed, and providing an exciting ride for their young passengers.

The SLiC and JLiC drove their RIBs from a position sitting on the jockey seat behind the console. The AI preferred to drive from a position standing next to the helm console on the port side, as she found it difficult to stand up in front of the seat, and felt that this position gave her better forward visibility when operating in waves (**Figure 4**).

Figure 4



Illustration showing *RIB 6* with driver standing at side of console

During this period, the AI noticed that her fuel gauge was low, making her a little concerned about her RIB's endurance now that the activity had been extended. She therefore turned *RIB 6* into smoother water to refuel, rejoining the other two RIBs about 10 minutes later.

By now, *RIB 5* and *RIB 7* had completed several circuits between the Mussel Bank buoy and buoy C6, and after also completing several high speed manoeuvres the AI re-joined the other RIBs close to buoy C6.

At about 2010, the SLiC decided that it was time to return to the centre, and he communicated this to his colleagues by a combination of shouting and hand signals. The three RIBs turned to the south of C6 buoy, with the AI in *RIB 6* about 200m from the SLiC, and about 100m in front of the JLiC. Noticing that *RIB 6* had turned further to the south and was beginning to encounter the larger waves on the north edge of South Sands, the JLiC shouted to the AI to get back to the channel, but she seemed not to hear.

1.4.5 Capsize and inversion

The AI intentionally caught up with a wave and drove her RIB on the back of it. She then caught a second wave, which started to take her further south. Seeing the worsening sea conditions ahead of her, she realised that she was standing in to danger and needed to get back to the north towards the other RIBs. She turned *RIB 6*, which slowed, allowing the wave behind to catch it up and lift the

stern. The starboard shoulder of the RIB “dug in” to the back of the wave ahead, slowing it rapidly and capsizing it to starboard with a tripping motion. The AI recalled hearing the engine race as the propeller came out of the water.

The AI was thrown clear of the RIB, and the “kill-cord”¹, which was attached to her, detached from the console, causing the outboard motor to stop. Some of the passengers were also thrown clear, but several others surfaced in the air pocket beneath the hull of the upturned RIB which had inverted on top of them.

One student was struck on the head as the RIB capsized, and became slightly dazed and confused. The others beneath the upturned hull quickly escaped to the open water, briefly leaving the injured student alone beneath the inverted RIB. However, he soon realised that he needed to escape, and within a few moments he too was able to dive clear of the RIB.

The AI and the passengers all remained fairly close to the boat, but most had difficulties holding on to it. It was now approximately 2020.

1.4.6 Initial rescue

The SliC in *RIB 5* reached the capsized RIB very quickly. He immediately counted heads and confirmed that all the occupants of *RIB 6* were safely on the surface. *RIB 6*’s occupants were all recovered into *RIB 5* without difficulty, and a second headcount was made.

Meanwhile, conscious that *RIB 7* was a smaller, less capable boat, the JliC had remained a short way off in the main channel.

RIB 5 and *RIB 7* then rendezvoused in the smoother waters of the main channel where the SliC and JliC assessed the situation and discussed their next action. The AI was dazed, and contributed little to the discussion. None of the passengers from *RIB 6* had reported any injuries, but they were also shocked and quietened by the experience.

The experienced instructors were concerned that the inverted RIB was now drifting away from the group, and likely to go further in to dangerous waters. Unknown to them, *RIB 6*’s anchor had fallen out of the open locker as the boat inverted and was hanging below the boat, anchoring it on the South Sands.

The SliC and JliC decided to transfer the wet students ashore to the beach at Abermenai Point using *RIB 5*, driven by the AI. Meanwhile, they would use *RIB 7* to try to recover *RIB 6*. The balance of passengers was to remain in *RIB 7* with them until the AI had dropped her first load of passengers on the beach, when she was to return to collect the remainder.

¹ Where there is a possibility of the helmsman being thrown overboard, most small high-speed craft are fitted with a safety device which shuts off the engine should that happen. This essential safety device is known as a “kill-cord”.

1.4.7 Rescue service alerting

The SliC and JIIC decided to call the RNLI for help with the recovery operation. The JIIC elected to call the coastguard by telephone as he felt that this would enable him to better describe his situation, and so save time. Using a telephone had the added benefit of not alerting others to what he felt to be an embarrassing predicament as he was also a coxswain of the local RNLI inshore lifeboat (ILB). As a result of *RIB 6* capsizing, the instructors' only mobile telephone, the AI's, had been immersed. The JIIC therefore borrowed a mobile telephone from one of the students, and at 2029 called 999 and was put through to HM Coastguard Holyhead.

The JIIC informed the coastguard that he was a member of the Beaumaris Lifeboat crew, and then reported that he was part of a group from Plas Menai which had been operating near Caernarfon bar when one of their RIBs had capsized. He emphasised that nobody was in the water, all were safe and accounted for, and they had been landed at Abermenai Point. He then asked for assistance from the Beaumaris lifeboat to attempt a recovery of the inverted RIB. He advised that they had a VHF radio available, and the coastguard requested the JIIC continue his communications on VHF channel 16.

At 2033, HM Coastguard Llandwrog Coast Rescue Team (CRT) was paged, and Beaumaris ILB launched at 2035. Members of the Llandwrog CRT initially stood by on the mainland side of the Menai Strait, in order to act as the eyes and ears of the coastguard. Personnel from Bangor Coastguard deployed to Plas Menai Centre.

1.4.8 Subsequent events

Afloat, the SliC had transferred boats to join the JIIC and five students in *RIB 7*. The AI had taken over *RIB 5*, and loaded it with 15 students and the AVH.

The AI went to Abermenai Point, where all of the passengers were landed ashore on the beach. The AI then returned to assist *RIB 7*, leaving the AVH in control of the group on the beach.

In the meantime, the SliC and JIIC in *RIB 7* had re-evaluated the situation and realised that conditions were too hazardous to attempt to salvage *RIB 6*. They were making their way back to Abermenai Point when they met *RIB 5* on the way out to them. Both boats then returned to the beach, arriving at 2040.

On the beach, the AVH had quickly realised that the boy who had been bumped on the head was at risk; he was cold and shocked, experiencing breathing difficulties and needed medical help. One of the students had first-aid training, and assisted the AVH with treating the casualty as best they could.

When he arrived at the beach, the SliC took charge of the first-aid efforts. Meanwhile, the AI loaded 15 students in to *RIB 5* and at 2045 departed for Plas Menai.

In order to communicate effectively with HM Coastguard Holyhead by VHF radio, the JIIC had to position *RIB 7* a short distance away from the beach, towards the main channel. This was not entirely unexpected, as the Abermenai Point area was known to have VHF radio coverage difficulties and the instructors were only using hand-held VHF radios.

The instructors had not been able to raise the Plas Menai Centre duty officer on their private VHF radio channel P1, or the mobile telephone. Consequently, when the AI reached the centre and disembarked her passengers at the slipway, the centre was not aware of the accident and there was no one there to meet them. The group's teachers first realised that there was a problem when they saw some students walking around the centre.

At Abermenai Point, the SliC and JIIC had become worried about the deteriorating casualty, and decided to request emergency assistance. At 2047 the JIIC contacted the coastguard by VHF radio to request a helicopter evacuation of one casualty.

A man living nearby had been routinely monitoring VHF radio traffic, and when he realised that there was an emergency and that he was able to help, he set out for Abermenai Point in his own large RIB. He later took the remaining students from the beach back to Plas Menai.

At about 2100 one member of the Llandwrog Coastguard CRT was transported across the strait by *RIB 7*, and the RNLI Beaumaris ILB arrived at 2105. By then, the casualty was shivering violently and having difficulty breathing, and he was administered oxygen by the lifeboat crew.

At 2106, the rescue helicopter landed a paramedic to the beach, and then moved away while the casualty was assessed and prepared for evacuation. The casualty and the SliC were flown to Bangor hospital, arriving at 2150. Following treatment, the casualty was released at 2330 and returned to the centre where, the following day he continued the course.

1.4.9 Environmental conditions - accident location

Conditions at the scene of the accident were recorded by the RNLI Beaumaris Lifeboat as:

Weather partly cloudy, visibility fair (1-4 miles), wind force 5 (fresh breeze - 17-21 knots), wind direction 203° (SSW), sea state slight (0.5 to 1.25m), swell 1.0m.

High slack water at Caernarfon bar was predicted at about 2043.

1.5 CLIENTS – THE SCHOOL PARTY

1.5.1 School

The school party consisted of students, one AVH, and teachers from an independent co-educational day school in the west of England. The school regularly used Plas Menai, and had sent many parties to the centre during previous years.

The school party arrived at the centre on the evening of Sunday 29 June, for a 1-week watersports activity course. All party members were staying at the centre.

1.5.2 Students

The school party consisted of 20 boys; aged between 14 and 15 years old, from school year 10.

Although one student had some sailing experience and basic first-aid training, the majority of the students did not routinely take part in watersports. The course therefore offered them an exciting opportunity to try new activities. The week's activity programme included sailing, kayaking, climbing, windsurfing and canoeing.

Activities on Monday and earlier on the Tuesday did not include any powerboat trips so, for many students, this was the first time that they had been on board a fast boat of any kind.

1.5.3 Adult Volunteer Helper

The AVH was a school “old boy” who had visited Plas Menai Centre several times before. While he had done some windsurfing on other courses, the majority of his watersports experience had been obtained at Plas Menai.

1.5.4 School teachers

Two male teachers accompanied the students. The lead teacher had undertaken many similar school trips to Plas Menai. As a result, he was well acquainted with the centre's activities and was content with the way in which they were run. The teachers did not participate in the evening activity and stayed at the centre.

1.5.5 Student casualty

The student casualty suffered from asthma and hay fever, for which he had been taking medication prior to the accident. During the capsized he suffered a blow to the head, resulting in a headache and a mild whiplash type injury. He also lost his medication, which caused him extra anxiety.

The time spent on the beach immediately after the accident resulted in the casualty becoming slightly hypothermic, and triggered an asthma attack from which he quickly recovered once treated in hospital.

1.6 PLAS MENAI PERSONNEL, INCLUDING FREELANCE INSTRUCTORS

1.6.1 Duty officer

The day duty officer was usually one of the well qualified and highly experienced senior members of staff. At about 1730, the day duty officer handed over to the night duty officer.

The night duty officer was a newly qualified instructor, about 18 years old. Although qualified, he needed to build up his experience in order to get full employment as a centre instructor. He was provided with living accommodation in the centre, and so was readily available for on-call work. His role was primarily one of site safety and security, but his duties included monitoring the portable VHF radio and mobile telephone provided for out-of-hours contacts. He was required to direct any communications to the appropriate senior member of staff, as detailed in the centre contact list. Specifically, he was not authorised to approve changes to activities, and he was required to contact a senior instructor to obtain this permission.

1.6.2 Instructors in charge

At Plas Menai it was relatively unusual for two very experienced instructors to be working together on an evening activity, so they were both recorded as “in charge” on the daily tasking log. It has therefore been necessary for the MAIB to apply the titles Senior Instructor in Charge (SliC) and Junior Instructor in Charge (JliC) to differentiate between the two men nominated as being ‘in charge’, and to accurately reflect the intentions of the centre’s management. Both the centre’s management and the three instructors involved acknowledged that the SliC was ultimately responsible for the activity.

1.6.3 Senior instructor in charge

The SliC began his watersports career in 2001 as a windsurfing instructor. He later became qualified as a Royal Yachting Association (RYA) advanced powerboat instructor, and held a commercially endorsed RYA advanced powerboat qualification, which allowed him to undertake charter work.

He had lived and worked in the Menai Strait area for 7 years, was a local boat owner, and knew the area very well.

The SliC had worked at Plas Menai on a freelance basis for 3 years. During the off-season he worked as a boat mechanic. As a freelance instructor at Plas Menai, he earned an additional payment for running evening courses for which he was called in by the centre when needed.

1.6.4 Junior instructor in charge

The JliC of the activity had spent the majority of his life on the Menai Strait. He had begun sailing as a child, had become a lifeboat crewman at 17, and his local knowledge and operational experience were exceptional.

He was qualified as an RYA dinghy instructor and a powerboat instructor, and he held many higher level qualifications issued by the RNLI which permitted him to helm the local ILB.

Although he was a freelance instructor, the JIIC had worked for Plas Menai for many years. On 1 July, the evening powerboat activity was his only work for that day.

1.6.5 Assistant instructor

The AI was a university student who was working at Plas Menai during her holidays as a freelance instructor. This was her third season at Plas Menai.

She lived in the area, had spent many years sailing on the Menai Strait, and her local knowledge was very good.

The AI was RYA qualified as a dinghy instructor and a dinghy racing coach, and she had obtained an RYA National Powerboat Certificate Level 2 at Plas Menai in September 2005.

The majority of the AI's powerboat experience had been gained while dinghy coaching so she was used to operating smaller, less powerful, and more lightly loaded RIBs. Although she had limited experience of larger, more powerful craft, she was considered to be relatively inexperienced, and this was reflected in her nomination as an assistant instructor on this occasion.

1.7 CENTRE REQUIREMENTS – INSTRUCTOR QUALIFICATIONS

The centre had formalised its minimum instructor qualification requirements for the various activities it conducted. For “powerboat driving” in the local area, the minimum level of instructor qualification was RYA Powerboat level 2. Both the SliC and JIIC significantly exceeded this level of qualification; the AI complied.

1.8 COMMUNICATIONS – VHF RADIO AND MOBILE TELEPHONE

1.8.1 Hand-held VHF radios

Each instructor and the majority of the professional staff were issued with a hand-held VHF radio, which they carried with them at all times. These radios were good quality, waterproof marine sets, equipped with a private channel, known as “P1”. This channel was the preferred means of radio communication at Plas Menai, and consequently was in use throughout the day. The hand-held radios were not equipped for Digital Selective Calling (DSC).

The hand-held radios were not provided with an accessory microphone/speaker so, in order to be able to use them effectively, they had to be worn high on the operator’s chest or shoulder. During the trip, the SliC and JIIC wore their sets tucked inside their buoyancy aids, while the AI wore hers attached to the front shoulder strap of her buoyancy aid.

1.8.2 VHF radio sets in Plas Menai RIBs

VHF DSC radios designed for mounting on small leisure and commercial craft have a number of advantages over hand-held VHF sets. The power output of an installed VHF radio could be up to 25W, compared with a hand-held VHF set's output of 5-6W. The installed radio's increased power, coupled with a separate antennae mounted to a high point on the vessel, provides significantly increased range over a hand-held radio under normal conditions. A further advantage of the installed radio is that it can receive a GPS input, which is necessary to enable DSC functionality.

The MCA "recommends" that coded commercial vessels² operating in a similar area should be provided with mounted radio equipment. Detailed MCA guidance on the increased benefits of fitting DSC equipment is available³ on the agency's website. HM Coastguard strongly recommends that DSC radios are fitted.

RYA guidelines for craft used by recognised training centres do not specify that VHF radios shall be of the boat-mounted type, or that DSC type equipment should be provided.

Although some of Plas Menai's RIBs had previously been fitted with VHF radios, the centre had found them to be unreliable. It was, therefore, the centre's policy not to equip its RIBs with mounted VHF radios, and at the time of the accident none of Plas Menai's RIBs had VHF radio sets mounted.

1.8.3 VHF radio base station at Plas Menai Centre

The centre had a VHF radio base station located in the reception area. During normal working hours this was operated by office staff. After hours, when the reception area was not manned, VHF radio cover at the centre was provided by the hand-held set carried by the duty officer.

1.8.4 VHF radio coverage at Abermenai Point

The SliC had not needed to contact Plas Menai from Abermenai Point during past activities, and so was not aware of any radio coverage difficulties when attempting to contact the centre from that area. The JliC was aware of potential difficulties using VHF radios in that area under certain conditions.

Tests conducted during the investigation, using a hand-held radio from a RIB at Abermenai Point, confirmed it was possible to contact the Plas Menai centre base station, but communications to a hand-held radio at the centre were much

² See: Table 16.1, MCA MGN 280, Small Vessels in Commercial Use for Sport or Pleasure <http://www.mcga.gov.uk/c4mca/mgn280.pdf>

³ See: <http://www.mcga.gov.uk/c4mca/gmdss.pdf>

less reliable. From the seaward side of Abermenai Point it was not possible to contact the centre from the RIB using a hand-held radio, the hand-held set having exceeded the limit of its range.

The CRT team member who was put ashore at Abermenai Point during the rescue reported no difficulties communicating with HM Coastguard Holyhead when using a hand-held VHF radio on channel 0.

1.8.5 Emergency VHF radio calls

“Mayday” is the internationally recognised prefix to a distress message, which is sent when there is grave and imminent danger to the vessel or person, and immediate assistance is required. A “Mayday” call would trigger potential rescuers into providing immediate assistance.

“Pan Pan”, is the internationally recognised prefix to an urgency call, which contains important information covering safety. It could be used to indicate that there was an emergency on board a vessel, but no immediate danger to life or to the vessel itself. The emergency services’ response to an urgency call would be tailored to the situation.

1.8.6 Mobile telephones

Plas Menai does not issue mobile telephones to its instructors on the water, but some instructors choose to carry their own. During this activity, the AI and several of the students took their phones afloat, but none of them was suitably waterproofed. Both the SLiC and JLiC left their mobile telephones ashore.

No mobile telephone signal coverage issues were reported either at the centre, or at Abermenai Point.

1.9 PERSONAL PROTECTIVE CLOTHING AND BUOYANCY AIDS

1.9.1 Protective clothing

Each instructor was wearing their own yachting-type clothing, which consisted of good quality foul-weather “oileskins” and appropriate footwear.

As this was not intended to be an immersion activity, the centre issued all students with lightweight spray suits, which they wore over their own warm clothing. Most students wore “aqua shoes”, of the type commonly worn to the beach.

1.9.2 Buoyancy aids

In accordance with Plas Menai instructions for powerboat sessions, the centre issued all students with 50N (EN 393) buoyancy aids. These were close fitting, of the type commonly used for dinghy sailing or canoeing. Each instructor was wearing their own 50N buoyancy aid, of a type similar to those provided for the students.

The guidance notes issued by the RYA to its training centres state that the use of buoyancy aids is acceptable for basic powerboat courses (which are similar to the planned activity). The RYA only requires 150N inflatable lifejackets to be worn for the association's advanced powerboat course.

1.10 BOATS AND EQUIPMENT

1.10.1 Boat coding/certification

None of the boats used during this activity were coded as small vessels in commercial use for sport or pleasure⁴. The RIBs carried not more than 12 passengers; therefore they were not required to be certified as passenger vessels.

1.10.2 Plas Menai RIB 6

Tornado Boats International Ltd, the manufacturers of this 5.8m RIB, describe the boat as having a pronounced bow sheer and a shape that easily punches through oncoming waves. They also state that the deep Vee-shaped hull allows the craft to operate in the roughest of conditions (**Figure 5**). The RIB was fitted with a CE plate noting it as suitable for use in the Recreational Craft Directive (RCD) category C⁵ "Inshore" area, with a maximum capacity of 10 persons.

Figure 5



RIB 6 seen from bow

⁴ Such craft are often referred to as "code boats". See MCA MGN 280.

⁵ The RCD was developed to make trade across the EU more equitable, not as an instrument for safety. However, it has been used as an indicator of suitable operating parameters. RCD Design Category C 'Inshore': Designed for voyages in coastal water, large bays, estuaries...where conditions up to and including wind force 6 (Beaufort scale) and significant wave heights up to and including 2m may be experienced.

Care should be taken not to confuse RCD category with similar terms used in the MCA categorisation of waters (see 1.12.1) as they do not equate.

RIB 6 was fitted with “jockey” type seats for the helmsman and two passengers, with remaining passengers expected to stand or to sit on the tubes. The boat was not fitted with toe straps or “stirrups” for any of its occupants to anchor their feet. The fuel tank was built in to the helm console, and there was an open stowage area in the bow for the anchor.

RIB 6 was used for RYA powerboat courses and consequently was fitted with a GPS.

The boat was not believed to have had any significant defects prior to the accident.

1.10.3 Plas Menai *RIB* 5

Plas Menai *RIB* 5 was a close sister craft to *RIB* 6, but with minor differences in seating arrangements. *RIB* 5 was also used for RYA powerboat courses.

1.10.4 Plas Menai *RIB* 7

Smaller than *RIB* 5 and *RIB* 6, Plas Menai *RIB* 7 was a 5m RIB, fitted with a 60HP outboard engine. *RIB* 7 was also certified as an RCD category C boat, with a maximum capacity of 7 persons.

1.10.5 Safety equipment

The Plas Menai Safety and Operations Handbook required each instructor, while afloat, to carry their own hand-held VHF radio, basic first-aid kit, a knife and a whistle.

Each RIB was provided with a safety pack, consisting of tool kit, first-aid kit, whistle, survival bag, flares and a fire extinguisher.

The keys for each boat were issued with the outboard motor kill-cord. The staff handbook required the kill-cord to be attached to the instructor and the boat at all times.

1.11 ELECTRONIC DATA EVIDENCE

1.11.1 *RIB* 6 - GPS

Despite being marketed as a waterproof model, the GPS unit on *RIB* 6 was damaged by water ingress, and when interrogated by specialists no data was found.

1.11.2 *RIB* 6 - Outboard motor

A manufacturer’s representative examined the outboard motor and no significant faults were found. Data from the engine management system indicated that the engine had run for a total of 54 hours, and for over half that time it had been idling. For most of the remaining running hours, the engine had been operated at about half speed. It was not possible to download data indicating the engine revolutions immediately prior to the accident.

1.12 CATEGORISATION OF WATERS

1.12.1 MCA categorisation of waters

The Merchant Shipping Notice (MSN) 1776⁶ sets out the categorisations of waters in the UK. These categorisations determine which waters are not regarded as “Sea” for the purposes of regulations made under the Merchant Shipping Act 1995.

The categories relevant to this accident are as follows:

Category C: Tidal rivers and estuaries and large, deep lakes and lochs where the significant wave height could not be expected to exceed 1.2m at any time.

Category D: Tidal rivers and estuaries where the significant wave height could not be expected to exceed 2m at any time.

The geographical area limits relevant to this accident are as follows:

Category C: Within the Menai Straits between a line joining Abermenai Point to Belan Point.

This area contained the authorised activity site.

Category D: Within the Menai Straits from a line joining Llanddwyn Island Light to Dinas Dinlleu...

This area contained the accident site. Therefore the RIBs were not at “Sea” at any time during this voyage.

1.12.2 Plas Menai categorisation of waters

Plas Menai centre operates its own system of categorising waters. These categories form a core part of the centre’s risk assessments, dictate the equipment required on its boats, and the authorisation levels required to operate in each area. The areas are marked on a large chart which is permanently displayed in the staff room, and amplifying details are in the staff handbook.

Plas Menai area 2 approximates to MCA Category C waters; Plas Menai area 3 is similar to MCA Category D waters. The authorised activity was to take place in Plas Menai area 2; the accident occurred in area 3.

1.13 PLAS MENAI SAFETY MANAGEMENT SYSTEM

1.13.1 Centre management, inspection and approvals

As a long-established centre, Plas Menai had a mature and well documented safety management system (SMS), which was approved by the Adventure Activities Licensing Service (AALS), the British Canoe Union (BCU), and the RYA.

⁶ For full details see: <http://www.mcga.gov.uk/c4mca/msn1776.pdf>

1.13.2 Safety and operations handbook

The primary document was the staff handbook, which incorporated the safety and operations handbook. The staff handbook was designed to ensure that instructional staff were completely conversant with the centre's policies relating to each activity, and also provided details of the centre's management structure. Records confirmed that each staff member had received their own individual copy of the book.

The handbook covered the following specific matters related to this accident:

- Responsibilities of instructors, including leadership, teamwork, and staff/staff and staff/student communications.
- VHF and mobile telephone communications, both within a group and to the centre.
- Risk management, including assessment of approved sites.
- The ability and prior experience of students.
- The operational environment, including awareness of weather and tidal streams.
- Qualifications, authorisation and responsibilities of instructors.
- First-aid and accident procedures, which included the requirement to inform the centre of an accident, and the overriding authority of the on-scene instructor to call the emergency services when necessary.
- Details of personal protective clothing and buoyancy.
- Powerboat user instructions, including safety equipment and mandatory checklists.
- Definitions of Plas Menai specific operating areas, site specific hazards and the safety equipment required for activities in each area.
- Details of the management authorisation that was required for each operating area, and the requirement to complete a Group Operating Area form when operating away from the centre.

The section on powerboat sessions stated that there must be a clear purpose to the powerboat journey, which

...is not to burn as much fuel as possible...but is...to learn about the Menai Strait, to learn to navigate, to learn about the environment including wildlife, history and what happens on the margins of the water.

1.13.3 Authorised, scheduled activity and “journeying”

In addition to the main training and tuition activities, Plas Menai course programmes contained optional evening activities and outings. The centre's

weekly outline programme showed that a *powerboat trip* had been planned for the evening of 1 July. The more detailed daily programme for that day showed that the activity was a *powerboat session and possible kite flying*.

The session was not intended to include powerboat training or tuition as the RIBs were to be used as a means of transport, known as “journeying”, from the centre to the kite flying location. The kites were to be flown by students, under the guidance of instructors. The activity, the nominated instructors, the activity area and the equipment to be used had all been formally agreed and recorded by centre management.

1.13.4 Group operating areas – the “away day” form

The SLiC was required to complete an “away day” form, which was to be handed to centre reception before departure. The form gave details of the instructors and students involved, the equipment used, and the operating area. The estimated time of departure and return, weather forecast and expected conditions were also recorded. The form completed for the authorised activity on 1 July shows the operating area and route plan as Plas Menai to Abermenai Point.

1.14 CENTRE REGULATION, LICENSING AND INSPECTION

1.14.1 Regulation

The Activity Centres (Young Person’s Safety) Act 1995 requires organisations that provide certain adventure activities for children and young persons under 18 years old, and who operate in a commercial manner, to undergo inspection of their management systems and to become licensed. The Adventure Activities Licensing Regulations 1996 were brought into force, and these were superseded by The Adventure Activities Licensing Regulations 2004⁷.

1.14.2 Adventure Activities Licensing Service

The Adventure Activities Licensing Scheme is a government sponsored scheme, which was introduced in 1996 under the Adventurous Activities Licensing Regulations. The scheme is currently sponsored by the Department of Work and Pensions.

Tourism Quality Services Ltd (TQS) operated the licensing scheme as the Adventure Activities Licensing Authority from 1996. However, in 2007, as a result of a widespread government regulatory reorganisation, the responsibility for implementing the regulations was transferred to the Health and Safety Executive (HSE), with TQS carrying out inspections on the HSE’s behalf as the Adventure Activities Licensing service.

Plas Menai’s licence was issued on 24 July 2007, and will expire in July 2009.

This licence does not include powerboating activities as the AALS does not currently license watersports using powered craft.

⁷ SI 2004 1359

1.14.3 Royal Yachting Association

The RYA⁸ is the UK national governing body responsible for sailing and powerboat activities. The RYA sets and examines the standards of equipment, safety and tuition at its recognised training centres. Plas Menai was an RYA recognised training centre for powerboating and sailing.

The RYA requires its training to be undertaken at recognised training centres by suitably qualified staff, following the relevant national syllabus, using appropriate, well maintained equipment with suitable safety support. The RYA requires that if a centre conducts activities afloat which fall outside the remit of RYA recognition, the centre must exercise all reasonable care and skill to conduct such activities in accordance with best practice and/or established national guidelines. At the time of the accident, there were no such guidelines specific to the ‘journeying’ activity covered by this report.

1.14.4 RYA inspection of Plas Menai Centre

On 3 July 2008, the RYA carried out a pre-planned annual inspection of the Plas Menai Centre. The inspection report revealed no deficiencies specifically relevant to this accident, but a recommendation was made for the two sections of the staff handbook to be consolidated into one concise document, avoiding duplication, at the end of the season.

1.14.5 Caernarfon Harbour Trust

The Plas Menai Centre manager was a trustee of the Caernarfon Harbour Trust, and an excellent working relationship between the Trust and the Centre had been developed over a number of years. This, together with recognition by the Trust that the Centre was staffed by personnel who had considerable boat-handling expertise, meant that the Trust did not require Plas Menai craft to be licensed.

⁸ See: www.rya.org.uk

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 FATIGUE

There is no evidence to indicate that any of the three RIB drivers was suffering from fatigue and, therefore, it is not considered a contributory factor to this accident.

2.3 ACTION AND CONDUCT OF INSTRUCTORS - SUMMARY

The accident occurred because the instructors involved chose to leave the Menai Strait, and to undertake an activity that was not authorised by the centre. Had the pre-planned activity approved by the course supervisor been conducted in accordance with Plas Menai procedures, this accident would not have occurred.

The revised plan involved increased risks, but these were not fully recognised or briefed to the AI. Without clear instructions or adequate supervision, there was nothing to prevent the AI from straying into dangerous waters with her RIB, where she placed her passengers in real danger by exceeding the limits of her ability and experience.

Once *RIB 6* had capsized, immersing its passengers, the senior instructors did not recognise that an emergency or, at least, a very serious situation had developed. They therefore focused on salvaging the inverted RIB, instead of returning the students and the AI to safety by the quickest means.

On a more positive note, when the condition of the casualty was fully assessed, the decision to seek the help of the emergency services was appropriate.

2.4 BRIEFING AND MENTORING OF THE AI

Considering the age of the students, the morning staff meeting decision to include a third RIB instead of a workboat was not unreasonable. However, the mix of a powerful fast RIB and an impressionable audience of young students potentially provided the encouragement for a youthful, inexperienced instructor to explore her boat's handling characteristics. The course supervisor and SliC should have been more alert to this risk, which could have been mitigated by more effective briefing and mentoring of the AI.

2.5 ENVIRONMENTAL CONDITIONS AND OPERATING AREAS

The environmental conditions experienced in both the Abermenai Point and Caernarfon Bar channel areas were as forecast and predicted. The wave conditions resulting from the interaction of weather, wind and tide were well known and widely publicised, and the conditions prevailing at the time of the accident were not unusual in any way.

The extensive local knowledge of all three instructors meant that they were well aware of the conditions likely to be found outside the Menai Strait. The rough water conditions that the group expected to encounter were a factor in their choice of location for the alternative activity; they actively sought a thrill.

Within its larger operating areas, the centre's documentation did not explicitly define operational limits in terms of rough water or other conditions. While it might be acceptable to conduct RIB rides within some parts of Plas Menai area 3, there are other parts of that area that are not suitable for this type of activity. The breaking waves over South Sands were one such example, but there are others in the centre's operating areas.

Plas Menai should consider developing more detailed limitations to their defined operating areas, including specific prohibitions where appropriate.

2.6 PROGRAMMED ACTIVITY AND ALTERNATIVE PLANS

In the event that it was not possible to fly kites at Abermenai Point there was no alternative plan. Should kite flying not have been possible, the senior instructors expected that the group would return to the centre. However, this expectation was not documented, nor made explicitly clear to the instructors. This lack of guidance, coupled with provision of a junior night duty officer at the centre, meant that the SLiC and JLiC felt confident enough to develop an ad-hoc alternative plan, and to implement it without seeking the permissions required by the SMS.

The possibility exists, that had the SLiC discussed his alternative plan with the course supervisor or other senior staff member, his plan would have been approved; the SLiC was an experienced advanced powerboat instructor who could have been trusted to develop an appropriate plan. However, the very act of formulating his thoughts to brief his superiors would have concentrated the SLiC's mind on the potential pitfalls in his plan, which he would then have considered. The subsequent questioning by his superior before approving the revision would also have provided an opportunity to focus on and mitigate any risks before the plan was put into action.

The Plas Menai staff handbook should be amended to include an explicit requirement for any changes to the approved activity or the operating area to be approved by the course supervisor or senior permanent member of staff, unless the change is for obvious safety reasons.

2.7 VHF RADIO COMMUNICATIONS

2.7.1 Emergency calls by VHF radio

The instructor's overriding authority to call for emergency assistance was explicit in the safety operations handbook, yet neither a distress nor urgency call was made. From this investigation, it is clear that the accident warranted at least a "Pan Pan" call, and arguably one of the instructors should have called "Mayday" immediately they realised that *RIB 6* had capsized.

That two well qualified and very experienced instructors did not perceive a capsized RIB and eight people in the water as an emergency situation demonstrates poor risk perception, and indicates a requirement for refresher training.

2.7.2 Limitations of hand-held VHF radios

Hand-held VHF radios have a lower power output than fixed sets, which, with the likelihood that their smaller antennae are at lower heights, means that they have a much reduced operating range. VHF transmission and reception ranges are reliable only within radio sight, and signals between hand-held sets have a range of about 5 miles at best⁹.

Given the distance between Plas Menai and Abermenai Point, the hand-held VHF radio sets carried by the instructors were a tenuous means of communication with the centre base station, which became unworkable when the night duty officer took over the radio watch on a hand-held VHF set. The inability to communicate effectively with the centre perpetuated a feeling of autonomy among the instructors. Not only did they not seek authority for their change of plan, but they also did not notify the centre immediately after the accident had occurred. Communications difficulties were foreseeable when the activity was originally scheduled, and arrangements could have been made for the more powerful base station with its higher aerial to be manned until all boats had returned to the centre.

Radio difficulties also occurred between the RIBs. While hand-held VHF radios are suitable for some activities, they are not appropriate as the sole means of communication in fast open boats, unless their speakers can be positioned close to the operator's ear. In this case, two of the instructors elected to wear their radios under their buoyancy aids, and found it more effective to shout across between boats and use hand signals, rather than communicate by radio. The AI did wear her radio clipped to the front shoulder strap of her buoyancy aid. However, when she strayed away from the main group, the JIIC shouted to her but did not call her by radio. His attempt to recall her to the main group was therefore ineffective.

⁹ Reference: Appendix 2 of MGN 324: http://www.mcga.gov.uk/c4mca/mgn_324.pdf

Hand-held sets without fist mikes or an accessory microphone/speaker are difficult to use effectively in an open boat, especially when travelling at speed. Plas Menai should, therefore, review its policy with respect to using only hand-held VHF radios afloat, and reconsider mounting fixed sets in its RIBs. Consideration should also be given to equipping the RIBs with DSC enabled radio sets due to the significant benefits this offers in distress situations.

2.7.3 Private VHF channels

The use of Plas Menai's private VHF channel P1 has a number of advantages for day-to-day operations, allowing routine communications to be exchanged in some degree of privacy, and without occupying a public channel for long periods of time. There is a risk, however, that in an emergency situation, communication continues on the private channel, thereby excluding HM Coastguard or others who could be of assistance.

Plas Menai staff instructions should specify the requirement for emergency traffic to be notified to the coastguard on VHF channel 16, as well as to the centre on P1. Ideally, the centre base station should have a dual watch facility so that channel 16 and P1 can be monitored simultaneously.

2.7.4 Communication with the evening duty officer

On 1 July, the SliC did not call the duty officer to seek permission for the new activity. However, the limitations of their communications were later exposed when the instructors tried to call the centre by both VHF radio and mobile telephone and could not raise the duty officer. This meant that centre staff were not aware of the accident until contacted by HM Coastguard, and that the school teachers were not aware until they met the students who had been returned to the centre by RIB.

Plas Menai is recommended to review its communications strategies and equipment, so as to ensure that centre activities are effectively supported by appropriate means of communication at all times.

2.8 MOBILE TELEPHONE COMMUNICATIONS

2.8.1 Inappropriate use of mobile telephones in emergency situations

Notwithstanding his experience and training, the JliC allowed his desire to minimise public knowledge of the accident to cloud his judgment, and he chose to call for assistance using a mobile telephone. Fortunately, the coastguard directed that subsequent conversation should be by VHF radio.

In this case, the valuable assistance provided by a local man using his own RIB was triggered by his monitoring of VHF radio channels. Had he been able to hear the JliC's initial call, it is possible he would have arrived on scene more quickly.

A mobile telephone can provide a valuable back up to VHF, but should not be relied upon for safety. For a number of reasons, mobile telephones are not the most effective means of calling for help when afloat:

- Telephone conversations are point-to-point, and cannot be picked up or monitored by third parties able to render assistance.
- Mobile telephone signals cannot be pinpointed by the coastguard, resulting in potential delays in locating the casualty.
- Mobile telephone communications are not optimised for operations off the coast. A signal is not guaranteed, there are large “blind spots”, and the service can quickly deteriorate offshore.
- Few mobile telephones are waterproof and most do not survive contact with water.

2.8.2 Appropriate use of mobile telephones

While mobile telephones are not suitable for emergency traffic, they are useful for passing administrative messages that could easily block radio channels for protracted periods. Examples could include liaison with the course supervisor over proposed changes of activity or location, or general information flow to teachers and group supervisors.

Plas Menai should review the communications needs of its staff and, if appropriate, provide instructors with suitably waterproofed mobile telephones.

2.9 EMERGENCY RESPONSE

The SliC’s and JIIC’s alternative plan was understandable. The weather conditions were unsuitable for kite flying and it was raining, but they did not want to disappoint their group. However, they did not seek approval for the changed plan, there were gaps in their ad hoc risk assessment, inter-RIB communications were weak, and they had not accounted for the AI deciding to drive her RIB into dangerous surf.

When the AI’s RIB capsized, their primary consideration was to regain control of the situation, minimise the damage and also reduce their exposure to criticism. Perhaps, in their own minds, had they been able to recover and right *RIB 6*, they could have towed it back to Plas Menai behind one of the other boats. By returning to the centre unaided, they could salvage some pride. Certainly, avoidance of personal embarrassment contributed to the JIIC’s decision to contact the coastguard by mobile phone instead of via VHF channel 16.

Whatever their motives, by focusing on salvage instead of the safety of their passengers, the SliC and JIIC significantly delayed the recovery of the occupants of *RIB 6* to shore, to get warm and dry, and potentially hazarded the health of one student. Once the occupants of *RIB 6* had been recovered to *RIB 5*, they could have been divided between the two remaining RIBs,

and transported to Plas Menai within minutes. En route, the RIBs could have diverted to Caernarfon had any of the survivors required more urgent attention. This action, in parallel with notifying the coastguard, would have ensured that medical or other emergency service assistance would have been available quickly if required. In the event, the AVH and 15 students were left on Abermenai beach for 10-12 minutes without any communications or assistance, and some 25 minutes elapsed between *RIB* 6 capsizing and *RIB* 7 departing Abermenai for Plas Menai with the students on board.

The purpose of training for emergency situations is to instil in people an automatic inclination to respond appropriately to crises. Both RYA and RNLI training emphasises that safety of life has primacy over recovery of equipment, yet the SLiC and JLiC ignored this principle on this occasion. Had any of *RIB* 6's occupants been more obviously injured, it is likely that the SLiC and JLiC would have reacted more appropriately. Nonetheless, there is a need to review the training of staff at watersports centres such as Plas Menai, to ensure that in emergency situations, safety of life takes precedence.

2.10 PERSONAL PROTECTIVE CLOTHING AND BUOYANCY AIDS

Given that immersion was not expected, the protective clothing and buoyancy aids provided to the students for the evening's planned activity were adequate.

With respect to the unauthorised activity, it was fortunate that the blow to the head suffered by the casualty did not render him unconscious, or the outcome could have been much more serious. Given the sea conditions likely to be experienced outside the Menai Strait, 150N inflatable lifejackets might have been more appropriate¹⁰ for powerboat operations in this area, and this could have been one of the course supervisor's considerations had he been invited to approve the revised activity.

2.11 RIBs AT PLAS MENAI

2.11.1 RIB suitability for Plas Menai operations

All three RIBs were found to be in good condition, were likely to have been operating within their design limitations, and there is no evidence to suggest that they were unsuitable for the authorised activity in Plas Menai area 2. The RIBs could have been suitable for safe operation in Plas Menai area 3, subject to authorisation and operator ability; under the control of the SLiC, *RIB* 5 was able to provide a rescue platform in that area without significant difficulties. However, while the boats themselves were suitable for the task, their seating arrangements were less effective.

¹⁰ Advice is available, for example from the RYA:

<http://www.rya.org.uk/KnowledgeBase/regulationsandsafety/Pages/buoyancy.aspx>

and the RNLI:

http://www.rnli.org.uk/what_we_duty_officer/sea_and_beach_safety/sea_safety/lifejacket_campaign

2.11.2 RIBs – passenger seating arrangements

There are currently no regulations preventing passengers in similar RIBs riding on the inflatable tubes; indeed the RCD plate on *RIB 6* indicated a capacity for 10 persons, while seating was provided for only 3. This meant that of the 8 persons on board at the time of the accident, 5 were required to sit on the tubes or deck, or stand, although Plas Menai requires passengers to be seated at all times when RIBs are in transit.

Using RIB tubes as seats could be acceptable for slow speed operations or in smooth waters. However, for high speed “journeying” or operating in waves, not only is there a significant risk of a person falling overboard, but also the likelihood of musculoskeletal injury is greatly increased. This is because, when seated on a RIB tube, an individual’s spine is often twisted slightly and curved, and in this position is not resilient to the repeated vertical shocks which are characteristic of high speed RIB operations¹¹.

Plas Menai Centre should review its relevant risk assessments, and for its fleet of RIBs reconsider the appropriateness of the seating arrangements for multiple occupants when travelling at high speed or in waves.

2.11.3 *RIB 6* – Stance of the helm

The AI stood at the port side of the console of *RIB 6* so as to get a better view forward. While this is a recognised technique when conducting powerboat training, it was not appropriate under the conditions prevailing at the time of the accident.

Instead of being securely seated, or braced while standing over the jockey seat, the AI’s position meant that her ability to operate the controls was reduced, hampering her ability to respond effectively once the RIB started to capsize.

Plas Menai should review the qualifications and experience of instructors and, where necessary, provide further training to cover safe and effective powerboat handling under all local conditions.

2.12 “JOURNEYING” - CENTRE REGULATION, LICENSING AND INSPECTION

“Journeying” by powerboat at Plas Menai was an activity that was not subject to specific scrutiny by either AALS or RYA, the authorities regulating activity at Plas Menai, as it lay outside their remit. Also, as the RIBs were neither “small commercial craft” nor passenger vessels, they were not directly subject to inspections by the MCA.

¹¹ Forthcoming MAIB report on the investigation of injury to a passenger on board the RIB “Celtic Pioneer”, publication is expected May 2009.

In many recognised training centres, the RYA's requirements and guidance for the conduct of instructing are also applied to non-instructional activities. However, there is no requirement for centres to adopt this approach, nor is the RYA's guidance on instruction always appropriate for other boating activities. For example, instructor/student ratios are prescribed for all RYA courses, but these could be unnecessarily constraining for activities such as journeying. This has been recognised by the RYA, which has issued guidance to its recognised training centres and affiliated clubs on the practices and procedures to be adopted for powerboat activities other than those involving direct RYA approved instruction.

SECTION 3 - CONCLUSIONS

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

1. Plas Menai's operating areas were geographically defined, which did not include operational limitations in terms of sea conditions, hazardous areas, or no-go areas. [2.5]
2. The instructors decided to undertake an alternative activity to that which had been approved, and Plas Menai's safety documentation did not unequivocally state that changes to an authorised activity must always be approved by senior staff. [2.6]
3. Plas Menai's communications plan was weak, specifically:
 - a. The limitations of using hand-held VHF radios in high speed powerboats had not been recognised. [2.7.2]
 - b. The implications of conducting emergency communications on a private radio channel had not been recognised. [2.7.3]
 - c. When the night duty officer took over radio watch on a hand-held radio, communications between the centre and instructors on the water at Abermenai were not possible. [2.7.4]
4. Once the accident had happened, the SliC and JliC focused on salvaging the RIB and recovering the situation, instead of concentrating on the safety of the students. Specifically:
 - a. The judgment of the SliC and JliC was flawed; they did not perceive the accident as serious, so no "Mayday" or "Pan Pan" call was made [2.7.1, 2.9]; and,
 - b. The students and the AVH should not have been left without communications or assistance on the beach at Abermenai Point. [2.9].
5. Journeying activities and boat trips at activity centres such as Plas Menai are not fully scrutinised by either AALS or the RYA. [2.12]

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

1. When operating powerboats outside of the Menai Strait, automatic inflatable lifejackets could be more appropriate than the buoyancy aids currently stipulated by the centre's safety handbook. [2.10]
2. Passengers sitting on the tubes of RIBs operating at high speed and in rough water are susceptible to musculoskeletal injury as well as falling overboard, and this should be addressed in Plas Menai's risk assessment. [2.11.2]

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

1. The AI was inexperienced, and should have been more thoroughly briefed and closely supervised. [2.4]
2. Mobile telephones are not appropriate for emergency communications at sea. [2.8]
3. The AI adopted an inappropriate position when driving *RIB 6*; this is indicative of inexperience and that further training is required. [2.11.3]

SECTION 4 - ACTION TAKEN

4.1 PLAS MENAI CENTRE

The centre manager has completed an internal investigation and forwarded a copy of his report to the RYA.

Plas Menai management has:

- Reinforced the need for all staff to follow centre guidelines and procedures.
- Undertaken to review its procedures where appropriate.
- Undertaken to conduct additional training of staff as required.
- Reviewed its long range VHF communications arrangements; provided an additional VHF radio base station at the centre which can be monitored during evening activities; and installed a mounted, waterproof VHF radio on board *RIB 6*.

4.2 THE ROYAL YACHTING ASSOCIATION

The Royal Yachting Association has:

Provided its recognised training centres and affiliated clubs with guidance on the practices to be adopted for powerboat activity other than direct instruction (**Annex 1**).

SECTION 5 RECOMMENDATIONS

Plas Menai Centre is recommended to:

- 2009/112 Review its risk assessments and thereafter amend its staff handbook to provide staff with further guidance and instruction on:
- operating areas, limitations and personal flotation requirements,
 - restrictions to operations dependent on seating availability,
 - considerations for 'journeying' and similar activities,
 - procedures for amending/changing authorised activities; and
 - emergency response procedures.
- 2009/113 Review its communications strategies and procure equipment as necessary, to ensure that all centre activities are effectively supported by appropriate means of communication at all times.

The Royal Yachting Association is recommended to:

- 2009/114 Promulgate to its centre principals, trainers and instructors the lessons from this accident, and emphasise that safety of life remains an essential requirement during all activities, which becomes of paramount importance as soon as the activity ceases to follow the briefed plan.

February 2009
Marine Accident Investigation Branch

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