

Report on the investigation of
the death of

Timothy Paul Atkinson

During the

Laser 4000 National Championships

Run by South Caernarvonshire Yacht Club

Abersoch, North Wales

On July 30th 2007

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GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS

50 NEWTON BUOYANCY AID	- CE Approved Buoyancy Aid designed for those who can swim and are close to help
CAPSIZE	- To overturn or cause to overturn
CENTRE SHEETED	- Sheeting arrangement for the main sheet.
CLASS ASSOCIATION	- An association of members sailing the same type of boat
COMMITTEE BOAT	- The vessel controlling dinghy racing
CREW	- Person who controls spinnaker, jib etc in a sailing dinghy
DAGGERBOARD	- A form of movable keel on a
DINGHY	- A small lightweight sailing boat which relies on the crew weight to give it stability.
DNC	- Did Not Compete in racing
FORESTAY	- A piece of standing rigging which stops a mast from falling backwards
GENNAKER	- A large asymmetric spinnaker which has similar control lines to a jib
GNAV	- A mechanism for stopping the boom of a sailing boat from rising up
HELM	- Person who steers a boat
INVERSION	- A complete 180 degree capsize
JIB SHEET	- The controlling line on the foresail of a sailing boat
KICKING STRAP	- A mechanism which prevents the boom of a sailing boat from rising up
LASER 4000	- A class of high performance sailing dinghy
LEEWARD	- Downwind
LOA	- Length Over All
LOWER SHROUD	- The lower lateral support for a mast
MAIB	- Marine Accident Investigation Branch
MAIN SHEET	- The rope controlling the main sail
MAINSAIL	- The sail aft of the main mast
MCA	- Maritime Coastguard Agency
NW	- North West
PRO	- Principal Race Officer
QRTH	- Quick Release Trapeze Harness
RACK	- Means for the crew to exert additional leverage with their weight.
RET	- Retired from Racing
RIB	- Rigid Inflatable Boat
RIGGING	- The wires holding up the mast
RNLI	- Royal National Lifeboat Institution
RUDDER	- The device used to steer a boat or aeroplane
RYA	- Royal Yachting Association
SAFETY BOAT	- A vessel used to assist or help vessels competing in racing
SAIL NUMBER	- The unique number on a racing boat which identifies it to other competitors and to race organisers
SCYC	- South Caernarfonshire Yacht Club
SELF DRAINING	- A design of dinghy which does not retain water after a capsize
SHROUD	- The lateral support wire for a mast
SLOOP RIGGED	- A fore and aft rigged sailing vessel with single mast
SPINNAKER	- The large down wind sail at the front of a sailing boat
SPINNAKER SHEET	- The controlling lines for a spinnaker
SPRAY TOP	- A water proof top worn on the upper body
STERN	- The back of a vessel
TRAPEZE HARNESS	- The harness which allows the crew to attach to a trapeze wire by means of a hook
TRAPEZE HOOK	- A hook which attaches to the lower fitting of a trapeze wire
TRAPEZE WIRE	- A wire attached to the mast of a sailing dinghy from which the crew or helm is attached to allow crew weight to be moved further outboard
VHF	- Very High Frequency radio
WETSUIT	- An expanded neoprene thermal garment used for water sports
WINDWARD	- Upwind
WINDWARD LEEWARD	- An upwind, downwind style of course used in dinghy and yacht racing
COURSE	

SYNOPSIS

On Monday the 30th July 2007 a competitor from Northern Ireland taking part in the Laser 4000 National Championships died as a result of being unable to free himself from the rigging of a sailing dinghy when the boat capsized and inverted. The Laser 4000 National Championships were being hosted by South Caernarfonshire Yacht Club in Abersoch, North Wales from July 28th – August 3rd 2007.

South Caernarfonshire Yacht Club is well known for running championship events and is a popular location with good facilities and an excellent sailing area in Cardigan Bay. The race management and safety boat teams running the event were suitably experienced, qualified and well equipped with committee vessel, safety boats and effective communications. The weather on the day was a NW force 3 – 4.

The boat involved in the accident, a Laser 4000, is a popular two person trapeze dinghy with approximately 700 boats having been built since its design by Phil Morrison in 1995.

The helm and crew of the Laser 4000 sail number 4082 had known each other for approximately a year and a half and had sailed together on six or more occasions prior to Abersoch. However when the helm's usual crew could not make the event, the new pairing teamed up to travel from Northern Ireland to Abersoch to compete in the event. The official entry list showed 39 boats were competing in this very competitive class championship.

On day two of the event, having just had their best result so far of 34th in the morning race, Laser 4000 sail number 4082 had just finished the downwind leg on lap one of a three lap race, when they capsized near the committee vessel. They had been having difficulty recovering the spinnaker just prior to this capsize and the crew had gone forward in the boat to sort it out. Whatever had caused the problem with the spinnaker was soon sorted and the crew attempted to return to the cockpit (possibly by stepping outside of the shrouds). It was during this manoeuvre that the boat capsized to windward and lay horizontal in the water 90° from a vertical position. The helm immediately climbed up on to the dagger board as is normal practice and attempted right the boat back to its normal upright position. However the helm quickly became aware that there was some sort of problem as the crew called out several times for help. Emily describes Tim as being on the port side of the boat in front of the rack at this moment. Uncertain what the problem was, the helm waved to alert the nearby committee boat that help was needed before climbing off the dagger board and swimming around the boat to try and help the crew. The crew was unable to release himself and despite the helms best efforts to support him in the water, the boat quickly inverted and the crew was dragged under.

Subsequent examination of the boat and personal equipment highlighted a 40° bend in the crews trapeze hook and a matching twist in the port lower shroud as being the most likely cause of the entrapment.

Meanwhile the race management team on the committee vessel had seen the helm waving and, realising there was a problem, immediately sent out a VHF call to all safety boats to attend the capsized boat. Approximately one minute after the capsize, the first of several safety boats arrived and the safety boat crew prepared to enter the water to assist the helm of the Laser 4000 right the boat. The second and third safety boats arrived soon after, having both seen the capsize and received the VHF call and prepared to assist.

The helm, with the help of the first safety boat crew managed to bring the Laser 4000 back up to a near horizontal position and the body of the crew reappeared. The helm then climbed over the bow of the dinghy to render assistance. The third safety boat was quickly manoeuvred into a position where the casualty could be reached and pulled out of the water and onboard the safety boat. After recovering the casualty, CPR was performed on the unconscious crew and the safety boat made its way back to the beach to be met by an emergency paramedic and shortly afterwards an ambulance also arrived on scene.

Despite the best efforts of all concerned the casualty was pronounced dead at the scene and the post mortem examination determined the cause of death as drowning.

SECTION 1 - FACTUAL INFORMATION

a. PERSONAL DETAILS OF THE CREW 4082 (the deceased)

Name : Timothy Paul Atkinson,

DOB: 27/12/58 Age 48 yrs

Height 5' 6" Weight 67 kilos Build – Slight/Medium

PERSONAL DETAILS OF THE HELM OF 4082

Emily Hadden

DOB. 01/02/71 Age 36 yrs

Height 5' 6" Weight 64 kilos Build – Slight/Medium

b. SAILING EXPERIENCE OF HELM AND CREW

Timothy Paul Atkinson had taken up sailing approximately 6 – 7 years ago first in yachts then in smaller racing dinghies.

Tim had competed as a crew in a 505 dinghy (a two person, single trapeze racing dinghy) for approximately 2 years. He then purchased his own Laser 2 (a two person, single trapeze dinghy) and in addition sailed a Laser 1 (single handed non trapeze dinghy) .

Tim was an active member of the Royal North of Ireland Yacht Club where other members described him as “ an enthusiastic, confident and competent sailor”. Tim also helped teach disabled adults to sail in Wayfarer dinghies .

Tim was reasonably experienced in a Laser 4000 having sailed with both Emily and with another helmsman in their Laser 4000's on occasions throughout 2006 and 2007 (probably about six times each) and had agreed to step in as a replacement for Emily Hadden's usual crew who could not make the National Championships event.

Emily Hadden was the owner and helm of Laser 4000 sail number 4082 and had crewed for 5/6 years in Laser 2 dinghies and then in boats such as the RS 400 (two person non trapeze high performance dinghy) and B14 (two person non trapeze high performance dinghy) .

Emily purchased her own Laser 4000 approx 3 years ago and had sailed and competed as helm for the past 3 seasons up until the time of the accident. Emily had already competed in the Laser 4000 European Championships in the 2007 season.

Emily is a member of Strangford Lough Yacht Club where she is also one of the clubs dinghy class secretaries.

(See Appendix A)

c. PERSONAL PROTECTIVE CLOTHING & EQUIPMENT

Tim Atkinson was found to be well clothed and equipped with full length wetsuit, 50 Newton buoyancy aid, wetsuit boots, spray top and trapeze harness worn over the top.



(Trapeze harness)

(See Appendix B)

d. PARTICULARS OF THE VESSEL

Laser 4000 Design: A one-design, two person sloop rigged dinghy of fiberglass construction. Notable features include: Single trapeze for crew, centre-sheeted mainsail, open self-draining deck, dagger board, single line hoist/drop spinnaker with gybing pole and a “gnav” system in place of the vang (kicking strap) allowing greater space for the crew.

Length (LOA) : 4.64m

Mast Height : 7.10m

Beam (width) : 1.50m - 2.30m

Sail Areas :-

Main (fully battened) : 10.80m sq.

Jib (fully battened) : 3.90m sq.

Gennaker (asym. Spinnaker) : 17.10m sq.

Designer : Phil Morrison

The boat involved in the incident was **Sail Number 4082** and was built in 1995 and was in fair condition for its age. A total of 700 boats have been built since 1995.



(Library Photo of Laser 4000)

(See Appendix C)

e. PARTICULARS OF THE EVENT

South Caernarfonshire Yacht Club (SCYC) has organised races since its founding in 1924 and has hosted many National, European and World Championships. Sailing takes place in the surrounding waters of Cardig an Bay with races being held for various dinghy and keelboat classes.

(See Appendix D)

The race regatta format was a four day, 11 race programme of races using a windward leeward course configuration with starts and finishes from committee vessel.

Thirty nine Laser 4000 dinghies were entered for competition.

Also taking place at SCYC was the Laser 2000 National Championships involving 49 x Laser 2000 dinghies. This fleet was not sailing at the time of the incident.

(See Appendix D)

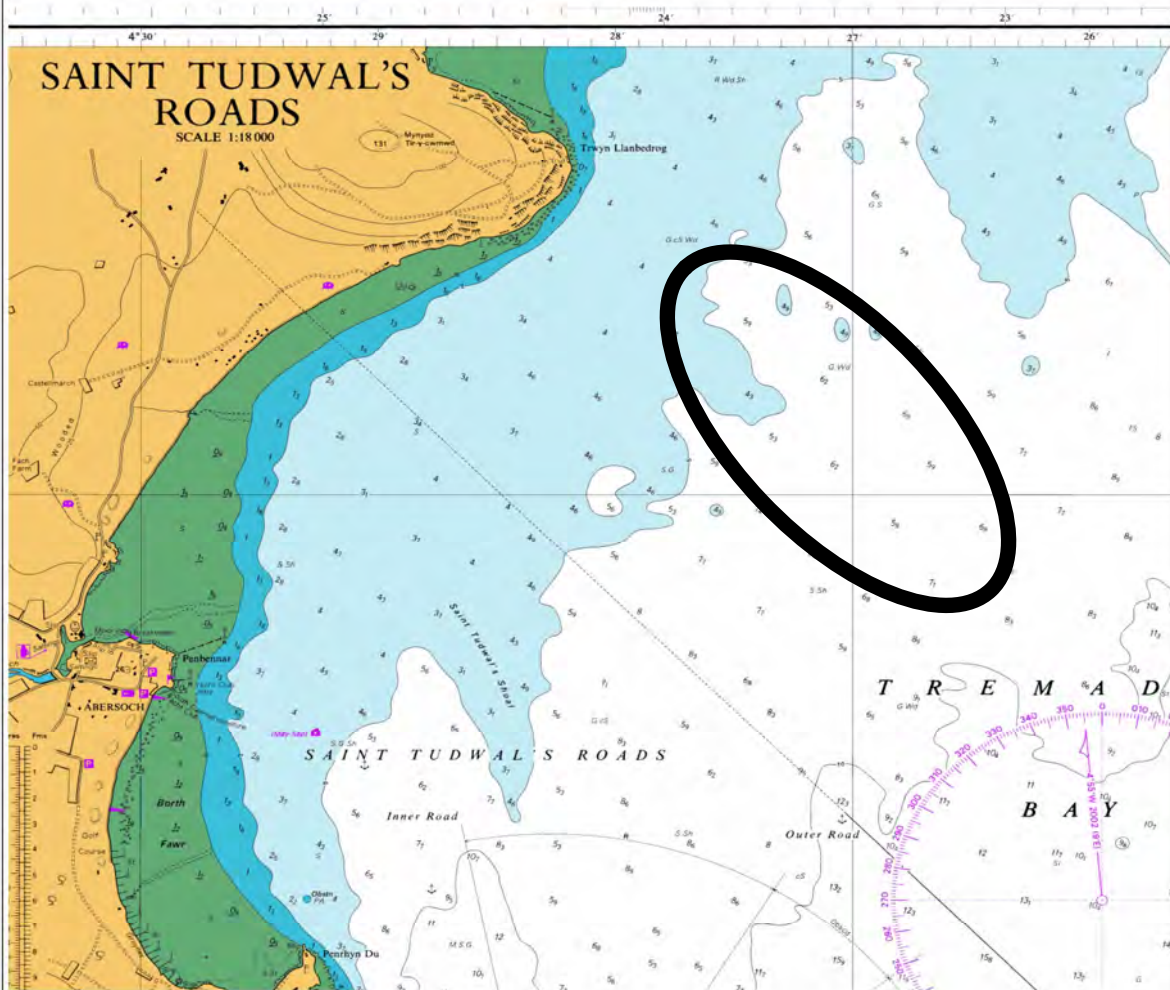
f. CHART OF ACCIDENT LOCATION



Chart Number: 1512
Title: Plans on the Lleyn Peninsula
Scale: Sheet of Plans
Datum:
Print Date: 23 Aug 2007

This chart has been reproduced from the Admiralty RYA Electronic Chart Plotter on the understanding that it will only be used in support of navigation. Persons using this chart information should be aware of the contents of the End User Licence Agreement.

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g. THE WEATHER ON - 30/07/07

North Westerly 10 – 11 Knots. (Force 3-4)

Water Temp 13 – 14 Celsius.

Cloud cover 11%

(See Appendix F)

h. SAFETY MANAGEMENT

One committee vessel with principal race officer (PRO) in charge of racing assisted by a race management team of 5 spotters, recorders and timers.

SCYC was in radio contact with committee vessel and safety boats on VHF channel 37 and M2.

Safety boats x 5 belonging to SCYC and 2 x member's safety boats equipped to club standards. All safety boats involved in the incident were of rigid inflatable design (RIBs)



Safety boat crews were qualified and experienced with RYA training certification.

(See Appendix G, H, I)

i. NARRATIVE

The Laser 4000 class association had arranged to hold their 2007 National Championships under the burgee of the South Caernarfonshire Yacht Club who would provide all race organisation, safety cover and

shore side facilities. SCYC is a popular venue for many national class associations to hold their championships.

The Principal Race officer and race team were experienced in running dinghy championships and the safety boat crews were also experienced and qualified to RYA standards.

Safety boats were well equipped to RYA guidelines. Radio communications between safety boats, committee vessel and the yacht club were maintained using marine VHF Channel 37a and M2. The Principal Race Officer, Barry McGill, in the committee boat was also the RNLi Launch Officer for the local lifeboat.

The Laser 4000 is an exciting two person trapeze dinghy with approximately 700 boats having been built since its design by Phil Morrison in 1995.

The helm and crew of the Laser 4000 sail number 4082 had known each other for approximately a year and a half and had sailed together on six or more occasions prior to Abersoch. However when the helm's usual crew could not make the event, the new pairing teamed up to travel, with another competitor, Anthony Strain, from Northern Ireland to Abersoch to compete in the event.

From the entry list 39 boats were competing but Laser 4000 sail number 4082 had had some rather poor results according to the result sheet finishing as "RET, DNC, DNC, 39th, 34th" in this very competitive class championship. (See Appendix J)

Tim and Emily had sailed on the Saturday afternoon having arrived in the morning, and Tim had been sailing in shorts and without a wetsuit, because it was a warm sunny day. Indeed on the first day of the championship, it was again a lovely day and Tim again wore shorts rather than a wetsuit. After a capsize in race one, Emily offered to retire and return to let Tim get his wetsuit on because clearly he was cold. Tim said that was unnecessary and so they stayed around the race area and Tim warmed and dried in the sun (they had chocolate, bread, donuts, cigarettes etc). On the third beat of the second race they did a double capsize, and so retired because it was unwise to stay out and for Tim to be cold. They went back to the club and missed the third race and sat in the sun on the terrace watching the racing.

During race 6 on Monday afternoon (day two of the regatta) Emily and Tim had, by all accounts, just finished lap 1 of a three lap race when they capsized after sailing through the leeward gate quite close to the committee vessel. They had been having difficulty with the spinnaker just prior to this capsize and Tim had gone forwards in the boat to sort it out. The boat was on port tack with the sails flapping on the starboard side. Emily was sitting to leeward on the same side as the mainsail to balance the boat whilst Tim sorted the Spinnaker. When this was done Tim tried to return to the main cockpit area of the dinghy possibly by stepping outside and around the wire shrouds which hold up the mast.

It was during this manoeuvre that the boat capsized to windward and lay horizontal in the water. Emily immediately climbed up on to the dagger board as is normal practice and attempted right the boat back to its normal upright position using her body weight as leverage. The crew in these circumstances is then expected to be “scooped” into the boat as it returns to an upright position.

At this point during the capsize of the Laser 4000 the boat was in a horizontal position approximately 90° from its normal upright position and the crew was lying in the water on the port side of the boat in front of the rack of the Laser 4000 and the helm on the dagger board on the other side, Emily heard Tim call out “help help”. Emily immediately tried to attract the attention of the nearby committee vessel by waving her arms. This was seen by the committee vessel who contacted the safety boats by VHF and requested all safety boats to attend. Emily heard Tim call out “help help” again and decided to leave her position on the dagger board and swim around the stern to where Tim was. Emily describes Tim as looking fine but he seemed to be struggling in the water and had his hands in the water below him as if pushing on something. Emily tried to support him but he slipped out of her hands as the boat inverted to 180° from its normal upright position and he was dragged underwater.

Very shortly afterwards, perhaps within a minute of the initial capsize, the first of several safety boats arrived in one of SCYC RIBs with Geraint Falk on board and as he prepared to enter the water to assist Emily, the second safety boat arrived on scene (this was the ‘Crompton’ RIB with Ben Cooke and Tom Crompton on board). The ‘Crompton’ RIB had seen the Laser 4000 capsize and was already making its way towards the dinghy. The crew of the Crompton RIB saw the helm waving and heard her shouting that the crew was “stuck”. However by the time the two safety boats had arrived the Laser 4000 was already inverted.

Upon arrival at the scene the ‘Crompton’ safety boat crew, Ben Cooke, immediately jumped in to the water and started to help Emily right the boat by using the dagger board as leverage. As the Laser 4000 came up to a near horizontal position the body of Tim Atkinson reappeared, Emily climbed over the bow to get to Tim and untangled the red Jib sheet from around his neck and turned him from face down to face up. Just as this was happening the third RIB, ‘Leo’, with Ian Jones on board, arrived. Ian put the bow of his RIB in to where Tim and Emily were and with Emily’s help pulled Tim out of the water and into the RIB. Ian commented that there appeared little or no resistance when he pulled Tim out by the shoulders of his harness. Ian Jones began to perform CPR on the casualty whilst Geraint Falk from the first RIB on scene swam over to safety boat ‘Leo’ and climbed in.

The PRO, in radio contact with the safety boat fleet, received a VHF call from 'Leo' requesting the immediate launch of the lifeboat which as Official Launch Officer for the RNLI, Barry McGill was able to do. Calls were also made by the club to the coastguard and ambulance.

Geraint Falk now proceeded to drive the RIB 'Leo' back to the beach whilst Ian performed CPR on the casualty.

Various other safety boats had also arrived on scene by this time.

The casualty was then taken to wards the beach in the SCYC RIB, "Leo", by Ian Jones and Geraint Falk. The lifeboat arrived on scene when "Leo" was about 500 yards from the beach and with the help of some of the lifeboat crew the SCYC RIB continued to take the casualty to the beach where paramedics were in attendance.

Tom Crompton and Ben Cooke from the "Crompton Rib" sailed the Laser 4000 to the beach, Jon Geddes from the Kingfisher Rib and Emily Hadden returned to the beach in the Crompton Rib.

Tim Atkinson was pronounced dead at the scene and then taken to a local Chapel of Rest.

After being interviewed by the North Wales Police on Monday the 30th July and statements and photographs taken, Emily Hadden was allowed to return to Northern Ireland along with her Laser 4000 on the very early ferry from Holyhead the next morning Tuesday 31st July.

j. SUBSEQUENT INVESTIGATION

The South Caernarfonshire Yacht Club (SCYC) contacted both the MAIB and the RYA regarding the accident and the MAIB commenced an administrative inquiry into the accident.

It was also decided that the RYA would undertake an investigation into the events leading to the death of Timothy Atkinson.

A member of staff from the RYA Racing Department, Duncan Truswell, was already nearby in Pwllheli preparing for another large regatta and was asked to make initial contact with the club and investigating Police Officer. Duncan arranged a timetable of interviews to take place on the evening of Tuesday 31st July and during Wednesday 1st August.

John Thorn from the RYA arrived on scene at approx 5pm on Tuesday 31st July to begin the investigation.

Briefings and interviews were held with the local North Wales Police investigating officer and all witnesses over the next 36 hours. The helm of the boat involved in the accident and the vessel itself had already been allowed to return to Northern Ireland on the early ferry that day.

Telephone interviews were held with Emily Hadden (the helm) on two further occasions.

Further evidence was gathered as it became available e.g. autopsy report, photos of the vessel, photos of the safety boats, photos of the personal

clothing, supporting documentation and the personal equipment worn by Timothy Atkinson.

SECTION 2 - ANALYSIS

a. EVIDENCE SUMMARY

- i. Witnesses statements clearly describe the capsizes and the actions described in the narrative. (See Appendix K)
- ii. Documentation and comments by other competitors indicate that this was a well organised event with good safety cover and well trained safety boat crew. It complied with recognised good practice. (See Appendix E, G, H, I)
- iii. The safety boat crews were immediately on scene and prioritised quickly. They carried out actions which provided the best chance of success for the trapped crew member. (See Appendix K)
- iv. Emergency services were also on scene quickly. (See Appendix K)
- v. Witnesses from the committee boat and safety boat are agreed that Tim was on the port side of the boat when he was pulled from the water. (See Appendix K) Emily Hadden also describes him as being on the port side during the capsizes. (See Appendix K)
- vi. Emily said that Tim had no other apparent injuries moments before the inversion. (See Appendix K)
- vii. Upon release of the clothing by the police and using the police photographs, examination of the trapeze harness spreader bar hook which connects the wearer to the trapeze wire was found to be bent and distorted by approx 30-40 degrees (See Appendix B)
- viii. Upon closer examination of the boat and police photographs the 3mm, 1 x 19, stainless steel wire, port lower shroud was obviously badly bent and distorted. This along with some distortion to the port shroud plate was the only damage found on the boat which could not be accounted for. (See Appendix C, L)
- ix. The kinks found in the wire were consistent with having been caused by snagging and subsequent rotation of the trapeze hook. The force required to effect this damage and the distorted trapeze hook was reproduced in laboratory conditions and found to be 162 kilos. (See Appendix L)
- x. The police autopsy was carried out on Wednesday 1st August at 10am. The cause of death was found to be drowning. Other injuries also included a broken nose and cuts and bruising to the face.
- xi. There has been one previous fatality with a Laser 4000 in 2002 and a recorded near miss in 2002.
- xii. Anecdotal evidence of other near misses involving Laser 4000 dinghies also exists.
- xiii. There have been two other near miss reports of trapeze incidents this summer (2007) in another two person trapeze dinghy – the Laser Vago.

b. SUMMARY OF KEY QUESTIONS

- i. Was the event and racing conducted in line with RYA recommendations?
Yes. The event complied with good RYA race management practice with experienced personnel in key positions of PRO and well trained safety boat personnel. Safety boat fleet was well equipped and prepared. Suitable risk assessments and safety control measures were also in place. (See Appendix E)
- ii. Was the weather suitable for the activity?
Yes. The weather was good with moderate NW force 3 -4 at the time, described as ideal sailing conditions. (See Appendix F)
- iii. Was the competence of the participants appropriate for the conditions, activity and venue?
Yes. The two crew members had many years experience dinghy sailing and the deceased was described as “an experienced and competent sailor” by members of his own yacht club.
- iv. Was the boat fit for use and competition?
Yes. The boat was de-rigged after the accident by experienced Laser 4000 crews who noticed nothing out of the ordinary or in poor condition. The only comment concerned the cross linking of the jib sheets to the opposite trapeze harness ring.
- v. Was the venue suitable?
Yes. SCYC in Abersoch is used by many national class associations because of its excellent sailing areas and experienced race management team. (See Appendix D)
- vi. Was the provision of safety cover adequate?
Yes. There were 7 safety boats on duty at the time of the incident for a fleet of 39 boats. The laser 2000 fleet were not racing at the time.
- vii. Were the safety boats appropriate for the operating area and in good condition?
Yes. The boats were rigid Inflatable boats of approx 5 – 6 meters and well suited to the role of safety boat. (See Appendix H)
- viii. Were the safety boats properly equipped?
Yes. The boats were suitably equipped as per equipment list in appendix. (See Appendix H)
- ix. Were the safety boats properly manned?
Yes. The safety boats had experienced and qualified crew with appropriate RYA certificates of competence. (See Appendix I)
- x. Was the immediate action taken by the race committee and safety boats crews appropriate and timely?
Yes. The safety boats were described by witnesses as appearing within 1 minute. The helm also describes the “immediate and expert rescue provision”. However, safety boat crews should be dressed suitably to enter the water immediately if required. The race officer called all safety boats immediately to help and the RNLI lifeboat was launched and arrived on scene before the safety boat reached the shore. Ambulance was also called. (See Appendix K)

- xi. Were the emergency services called immediately?
Yes. The PRO was also the launch officer for the Lifeboat which was immediately given authority to launch. Ambulance and helicopter were also called to scene. (See Appendix K)
- xii. Were actions after the event appropriate to help the subsequent investigations?
Yes. The club, police, safety boat crews, and witnesses all helped piece together the events leading to the death of Tim Atkinson. The club released statements to the press and the other competitors were all briefed on events. One decision which could have saved time would have been to keep the boat at the club for closer examination rather than allowing it to go back to Northern Ireland prior to the RYA investigation commencing. The damaged shroud was therefore not discovered for several days.

SECTION 3 - CONCLUSIONS

- a. Laser 4000 sail number 4082 capsized and inverted after completing 1 lap of race 6 in the 2007 Laser 4000 National Championships.
- b. At some point during this capsizing the hook on the trapeze harness being worn by the crew, Tim Atkinson, became caught on the lower port shroud.
- c. Despite efforts by the helm to prevent it, the capsized Laser 4000 continued turning over until a full 180° inversion resulted.
- d. As the boat inverted Tim was unable to release his trapeze hook from the port lower wire shroud or escape from his trapeze harness.
- e. Tim was dragged underwater as the boat inverted and as a result he was drowned.

SECTION 4 - LESSONS LEARNED AND RECOMMENDATIONS

- a. Some dinghies can invert very quickly after an initial capsizing. The speed of inversion reduces the time available to release any crew who might be entrapped.
- b. Dinghy trapeze harness hooks have been involved in several near miss incidents of entrapment and two previous fatalities. One of these also involved a Laser 4000 dinghy.
- c. The RYA, manufacturers and class associations should raise awareness of the risks and hazards surrounding the issue of capsizing and inversion and the use and wearing of dinghy trapeze harnesses and issues surrounding the risk of entrapment.
- d. The RYA should vigorously promote the development and adoption of an ISO standard or set of requirements for harness equipment in order to

assist manufacturers in the design and production of effective and suitable quick release systems for dinghy trapeze harnesses.

- e. Organisations should be encouraged to preserve all evidence on scene, including the vessels that may be connected with a marine accident until after an investigation has taken place.
- f. The RYA should raise awareness amongst manufacturers and designers of the need for design characteristics which prevent or slow down the rate of inversion in the event of a capsize or knockdown to 90°, and to minimise the risks of entrapment in the event of inversion. The latter should especially consider the ease of access from abaf t to forward of the mast.

SECTION 5 – APPENDICES

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