BMT Isis

Lymington Ferries
Summer Review 2009

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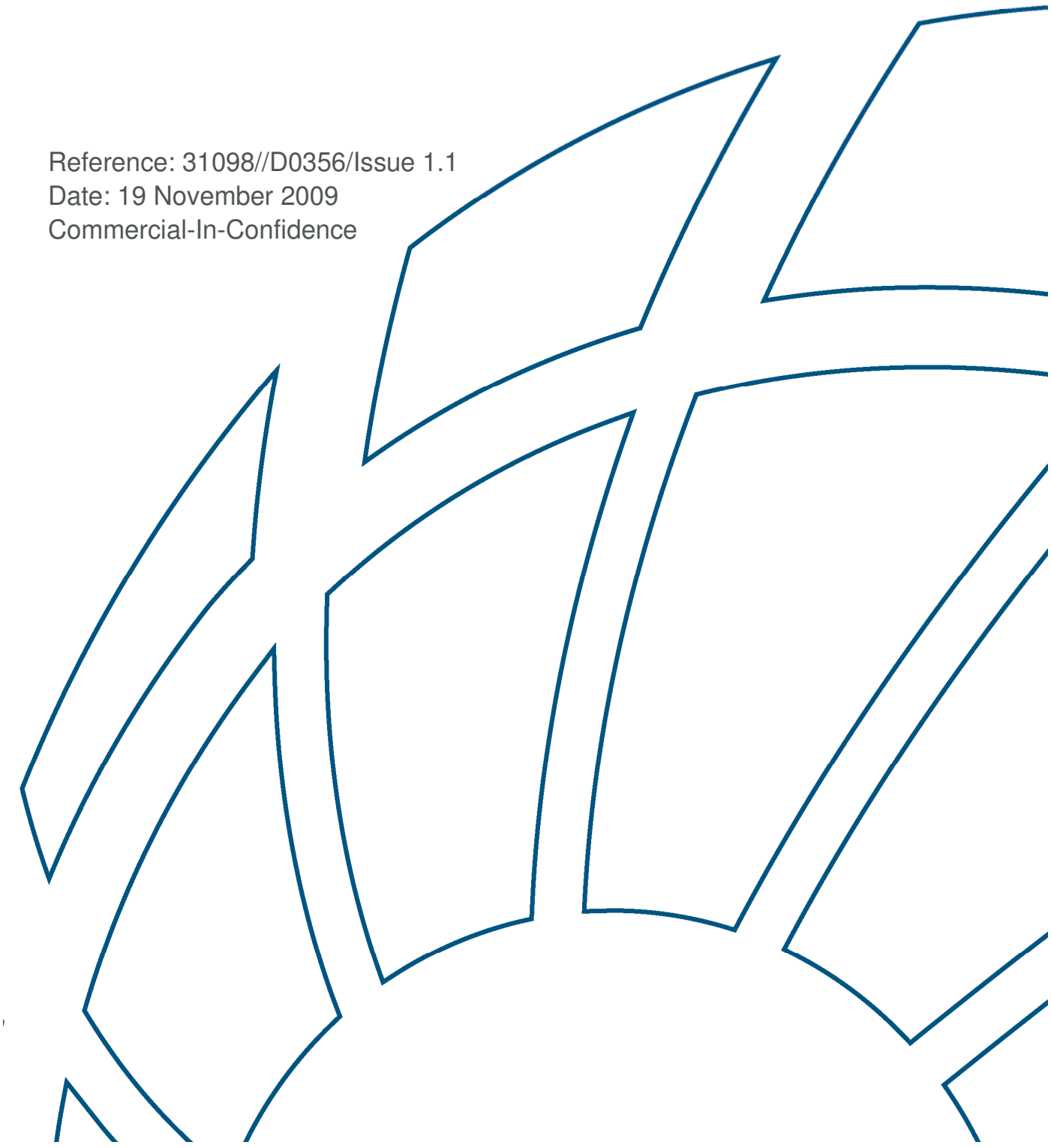

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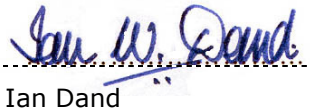

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Executive Summary

This report describes a review of operations on the Lymington River during the summer sailing season of 2009, the first with the new W-class ferries in operation.

Attention focussed on the effects of high traffic density in the river, as well as adherence by the ferries to the Safe Operating Profile developed in Phase 2 of the overall Risk Assessment study. In addition, the effects of a strong easterly wind, combined with a strong ebb cross flow were witnessed, these conditions not having been met in Phase 2 when the W-class vessels were first trialled on the river.

Observations were made by a BMT team of two, one of whom was one of the independent master mariners used in Phases 1 and 2 of the study. These individuals sailed onboard the W-class ferries as well as observing matters at river level from the Harbour Master's vessels. Dates for observation were chosen in collaboration with the Royal Lymington Yacht Club and the Lymington Town Sailing Club as being times when the river was expected to be at its busiest with sailing traffic. Some dates were chosen so that high traffic density coincided with very low water late in the afternoon, when vessels were returning to the river.

It became clear that, in general terms, leisure users and the ferries were co-existing on the river satisfactorily and there was a high degree of compliance with the Collision Regulations (ColRegs) and local Byelaws. However, an area of concern was identified which related to berthing manoeuvres at the Lymington Terminal. It became apparent that, during these manoeuvres, wash from the ferry thrusters could affect leisure craft passing the ferry, especially in an easterly wind. Accordingly a local notice to mariners (LNTM 11, 2009) was introduced to advise leisure users on safe procedures to use while a ferry was berthing and on the proper use by the ferries of agreed departure sound signals. To deal with the case when the ferry was secured alongside, an agreement was reached between Lymington Harbour Commissioners (LHC) and Wightlink for the adoption of revised procedures to minimise both the need for thrust and its impact on other users when, in exceptional circumstances (such as in a strong easterly wind), its use cannot be avoided.

Compliance by the ferries with the Safe Operating Profile was good and the profile itself was successful in minimising disturbance to other river users. The effect of river traffic density did not appear to compromise operations or safety and, although there were some incidents, these were few in number and comparatively minor. The ferries were, however, impeded fairly frequently by users and occasions also arose in which ferries departing the terminal did not allow enough room for leisure craft to pass the terminal safely.

The Risk Register was revisited and it was concluded that, while not needing any change to its fundamental structure, a number of comments could usefully be made and these were introduced into the Register. Two risks were now adjudged to be As Low As Reasonably Practicable (ALARP), but it was clear that risks associated with berthing and mooring at the Lymington Terminal should reduce further when the necessary works on the jetty are completed.

A number of recommendations were made, but it was concluded that the low level of marine risk on the Lymington River had not been compromised by the introduction of the W-class ferries. It was also concluded that the risk management approach adopted by LHC in respect of the introduction of the W-Class ferries complies with the requirements of the Port Marine Safety Code.

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1 Introduction

The report "Ferry Operations at Lymington: the W-class Ferries", BMT Report on Phase 2 of Project C13537.01, April 2009 (Reference 1) is an assessment of risk and, therefore, safety on the Lymington River after the introduction of the Wightlink W-class ferries. The assessment had, of necessity, to be carried out once the new ferries had arrived and crew training and familiarisation was under way. This occurred in autumn 2008 and all trials associated with the risk assessment were not complete until the spring of 2009.

Although the trials had covered a large number of the variables associated with risk and safety, a significant variable was missing. Because of the timing of the trials, leisure traffic on the river was light and the effect of traffic density, the missing variable, remained to be determined. In addition it was important that adherence to, and the effect of, the LHC Safe Operating Profile (SOP) developed from the findings of Reference 1, be noted during the sailing season when the river was busy and, finally, the effect on operations of strong winds from the east (not experienced in the trials of Reference 1) remained to be observed.

Accordingly, a Review was carried out over the summer of 2009. This focussed on times when the river was likely to be busy and, on occasions, when the tide was also expected to be low, thereby restricting the amount of water space available. Observations in strong easterly winds were made when the situation arose, the other metocean conditions prevailing at the time being accepted.

This report describes and summarises the Review after which the Risk Register of Reference 1 is revisited and an overall opinion formed as to the safety of operations on the River in the presence of the W-class ferries.

2 Aims and Scope

2.1 Aims

The main aims of the Review were as follows:

- To observe operations when the river was busy and/or when the tide was low and water space restricted;
- To review the adherence to, and effect of, the Safe Operating Profile (SOP) on river operations;
- To observe the way the W-class ferries behaved in a moderate-to-strong easterly wind, in conjunction with a strong ebb tide in Long Reach;
- To consider ferry-related incident reports received or raised by LHC over the sailing season and revisit the Risk Register of Reference 1, updating as necessary;
- Form an opinion of the overall levels of marine risk and safety on the river during the sailing season when traffic densities are high.

2.2 Scope

The scope of the Review was limited to:

- Observations on board the W-class ferries and at leisure craft level on the river; at least one of the observers was to be one of the independent BMT master mariners used in the Phase 2 study (Reference 1);
- Measurements were restricted to ECDIS readings from the bridges of the ferries, together with metocean data from local sites, freely available on the web;
- LHC had previously liaised with both the Royal Lymington Yacht Club (RLymYC) and Lymington Town Sailing Club (LTSC) to identify dates when the river was likely to be busy and/or low water was likely to coincide with a high leisure traffic density. Accordingly, observations were carried out on these dates;
- One "incognito" visit was to be made in an attempt to see if operations were affected by knowledge on the river that observations were to occur on a given day. No prior warning was given to anyone for this visit.

3 Methodology

As mentioned above, the Review both determined the effect of the SOP on safe operations on the river and collected new information in order to fill the information gap in the Phase 2 study concerned with safety implications of high seasonal levels of river occupancy and the effects of a strong easterly wind.

Two members of BMT staff carried out the study, of whom one (Captain Noble) is one of the two independent master mariners used in the Phase 2 study; both BMT personnel travelled on board the ferries and/or on the water, observing operations. The ship visits occurred on normal operational runs and the Wightlink masters were not asked to perform any manoeuvres outside of those normal for the traffic and schedule on the day.

Where possible, observations were made of:

- Overground speed and adherence to speed limits;
- River discipline by all users;
- Effect of Harbour Master patrols, when appropriate;
- Passing and traffic behaviour in the Short Reach Lay-by area;
- Adherence to the Safe Operating Profile;
- Adherence to the ColRegs by all users, including the use of sound signals;
- Effect on ferry behaviour of strong winds, with the focus on those from an easterly direction, but also any others from any direction;
- Traffic density, bunching and effects on operations;
- Any need for waiting in the river, to give assistance for example;
- Thruster usage, if possible;
- Interactions between ferry and race schedules;
- Wind shadow effects on safety, especially when two W-class vessels pass in the Short Reach Lay-by area;
- Ferry/small boat interaction effects, including boats moored near the navigation channel.

Information was collected from the ECDIS displays on the W-class bridges as in the Phase 2 study, supplemented by some photographs of the ships' radar to indicate traffic levels in both the River and the Solent crossing area. It was originally intended to download screen dumps of the radar in a manner similar to that employed for ECDIS data, but this proved impossible; it transpired that the USB port for the radar was used simply to upload new radar information rather than download screen dumps. Photographs of the radar screen were used as a substitute, supplemented by photographs and observations of the actual traffic on the river.

It was also hoped that it would be possible to download time histories of the thruster activity during a passage, but this also proved to be impossible. However, the BMT observers noted the thruster settings used on each passage and were therefore able to check on adherence to the requirements of the SOP in this regard. This made possible the most important thruster check: that the correct SOP settings were used for the weather conditions prevailing at the time.

On completion of the Review the report and its findings are to be presented to the existing River Users' Safety Committee (comprising members from Wightlink, RLymYC, LTSC, LHC, Lymington rowing Club and LHAG), LHC having the overall responsibility for safety on the river. This Stakeholder Forum has been used successfully for some years to discuss ferry/leisure craft interaction on the river and to inform risk assessments made by the Safety Committee.

The Review also satisfies the Port and Marine Safety Code (PMSC) requirement of continuous safety reviews on the river.

4 Observations

Observations were carried out as shown in Table 1.

Date	Time of Day (BST)	Attendee(s)	Reason
11/5/09	1500 - 1845	JN, ID	Ferry operations in strong easterly wind
13/6/09	1255 - 1920	JN	Busy weekend; Optimist Open Meeting
24/6/09	1345 - 1945	ID	WJS and evening racing
4/7/09	0945 - 1800	JN, ID	Busy weekend; RS Open Meeting
9/7/09	1730 - 1945	JN, ID	Evening keelboat racing
30/7/09	1730 - 2000	ID	"Incognito" check on operations etc
22/8/09	1230 - 1830	JN, ID	Busy weekend with evening LWS tide

Table 1 Schedule of Observations
NB: JN = Capt Noble, ID = Dr Dand

Weather and tide conditions for the periods shown in Table 1 are given in Table 2.

Date	Tidal Range (m)	Mean Wind	
		Speed Range (kts)	Direction Range (°)
11/5/09	0.87 to 2.81	22.2 to 26.6	060 to 080
13/6/09	1.30 to 2.62	5.0 to 10.2	220 to 260
24/6/09	0.72 to 2.97	11.4 to 21.0	070 to 090
4/7/09	1.46 to 2.82	2.0 to 14.6	060 to 230
9/7/09	1.05 to 1.98	13.2 to 15.0	290 to 320
30/7/09	2.44 to 2.80	16.8 to 26.8	240 to 270
22/8/09	0.46 to 3.22	8.8 to 12.0	160 to 230

Table 2 Applicable Metocean Conditions

Visit reports are given in Appendix 1 and details are considered in Section 5, but the following general remarks regarding the main observations may be made:

- Both the ferries and the leisure users appeared to have found a way to co-exist satisfactorily. Although there were some issues remaining, events on the river passed off safely on the whole without any serious accidents. As will be discussed in Section 5 below, wind shadow was a problem, but most yachts coped with it, provided they anticipated the effect;
- In most of the visits, it was proving difficult, if not impossible, for the ferries to adhere to the published timetables. Both two- and three-boat services were in operation and it was clear that the former service was more likely to adhere to the timetable. Delays were due to a number of factors outwith the control of the ferry masters and included:
  - Road traffic congestion while leaving the Yarmouth terminal when the main road has a tail-back due to traffic light operation (Figure 1);
  - Garage deck lifting problems;
  - Large loads and the time needed to load/unload;
  - Sailing races starting in the Solent and passing across the ferry course;
  - Use of a prudent, low passage speed in low water conditions in the river;
  - The need to load/unload foot passengers over the bow ramp at Lymington instead of the side doors. This slows the loading/unloading of vehicles via the bow ramp;
  - Waiting outside the river for the outbound boat;
  - Slow mooring in easterly winds (see Section 5.1.3 below)

Such matters are relevant to the timing of sailing events in such a way as to fit in with ferry schedules.

- During evening sailing observations, movement of the racing fleet down river to the start occurred in such a way as to avoid inbound or outbound ferries. Parts of the returning fleet often were able to avoid ferry river transits, but when sharing the river with the ferries, no problems emerged;
- In general terms, observation of the ColRegs by all river users was good; there were some exceptions, but these were comparatively small in number;
- Use of the ferry thruster settings generally complied with the SOP, but experience gained by the Masters had shown that using a "half/half" thruster setting had better balance when moving between lay-by berths and the linkspan and in the last stages of berthing, especially in easterly winds;
- Some issues remain with regard to ferry berthing at Lymington and these are discussed in the next Section;
- Bridge team numbers generally complied with the recommendations made in Reference 1, but this also receives further discussion below.

Figure 1: Departing Traffic Congestion at Yarmouth.

5 Review of Operations

In this Section, a review of the operations on the river, as observed by the BMT team, is made. Its purpose is to look at various key aspects related to marine safety and to provide enough evidence-based and observational information to form an opinion (Section 7) on:

- The safety levels on the river with the W-class ferries in operation;
- Adherence to safety-related requirements such as the ColRegs and the SOP.

This also informs the Risk Assessment in Section 6 in which the Risk Register and Recommendations of Reference 1 are re-visited.

The discussion in this Section falls naturally into two parts: that related to operations of the ferries themselves and that related to leisure craft operation.

5.1 Ferry Operations

Ferry operations are grouped under a number of headings for convenience.

5.1.1 Operations in a Strong Easterly Wind and Strong Ebb Flow

The visit notes from the exercise on 11 May 2009 are given in Appendix 1. It is seen from Figures 2 and 3 that the wind on each observed run was from a direction north of east over the observation period, and the spring tide had a low water value around 0.9 metres.

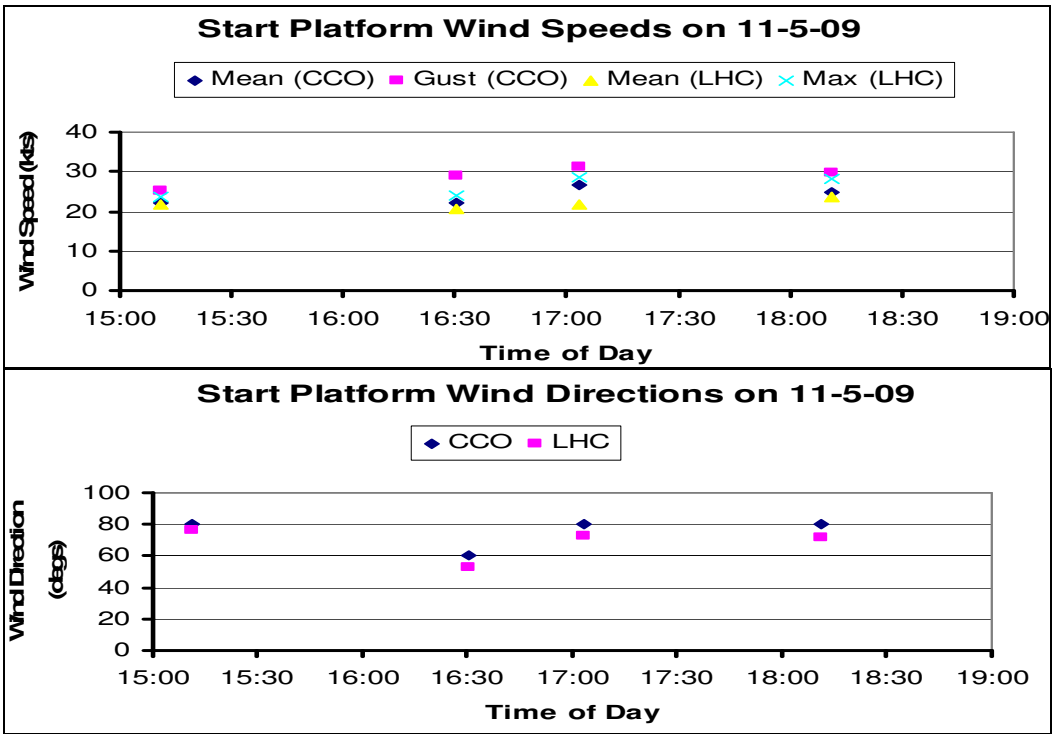


Figure 2: Datum Wind Speeds and Directions for observed runs on 11 May 2009

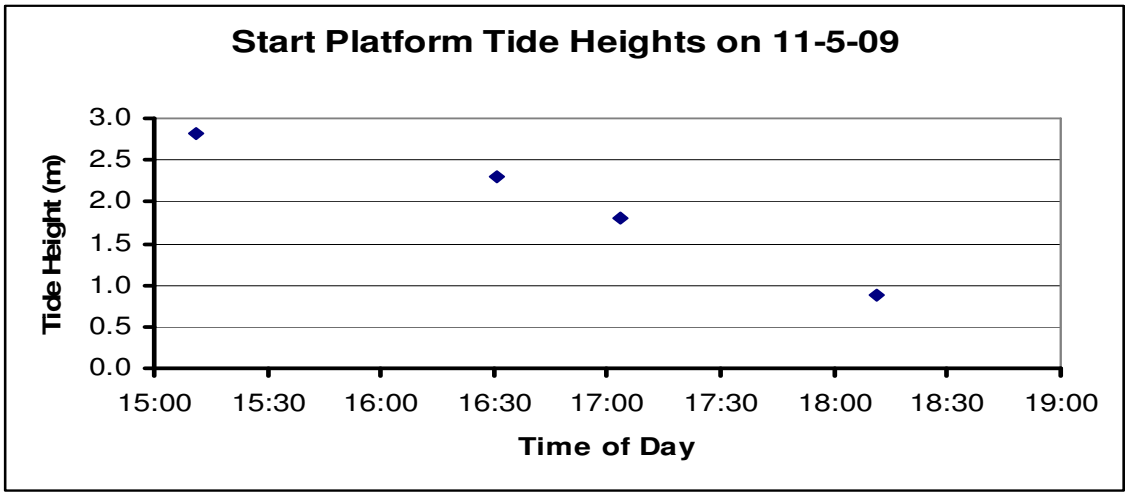


Figure 3: Tide Heights for observed runs on 11 May 2009

Tracks for the four runs observed on the day are given in Figures 4 to 7. It should be noted that the mean wind and current vectors shown on the plots are indicative only; the actual values for the wind are shown above.

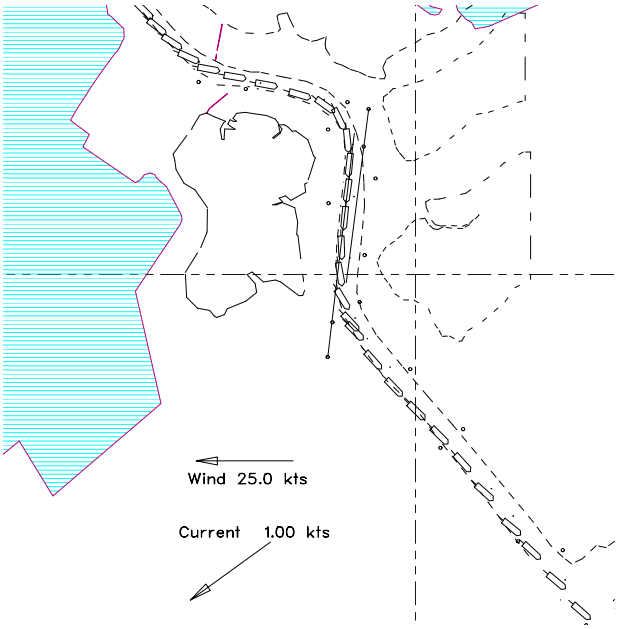


Figure 4: First Observed Run (Run 91): Outbound

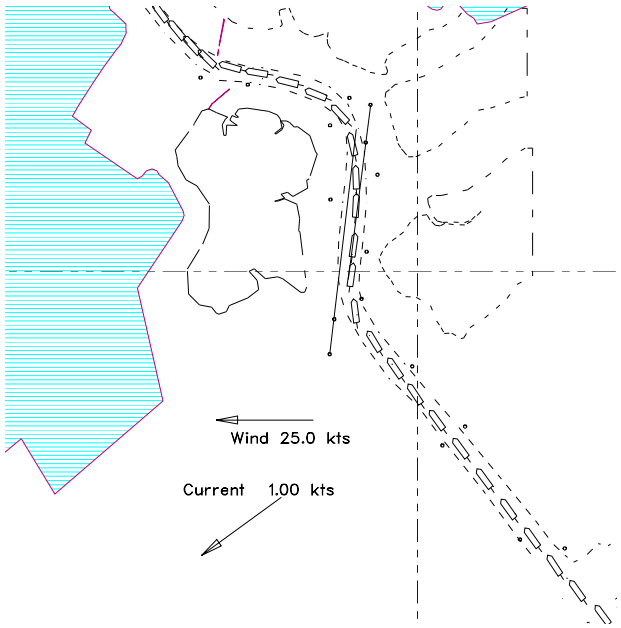


Figure 5: Second Observed Run (Run 92): Inbound

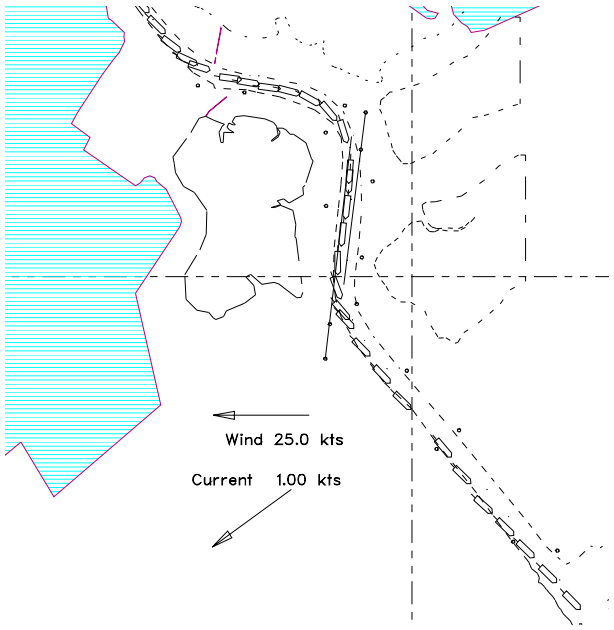


Figure 6: Third Observed Run (Run 93): Outbound

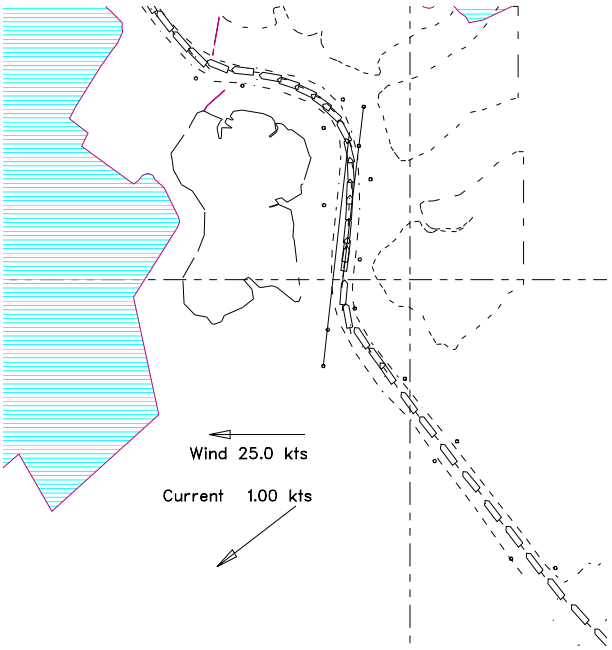


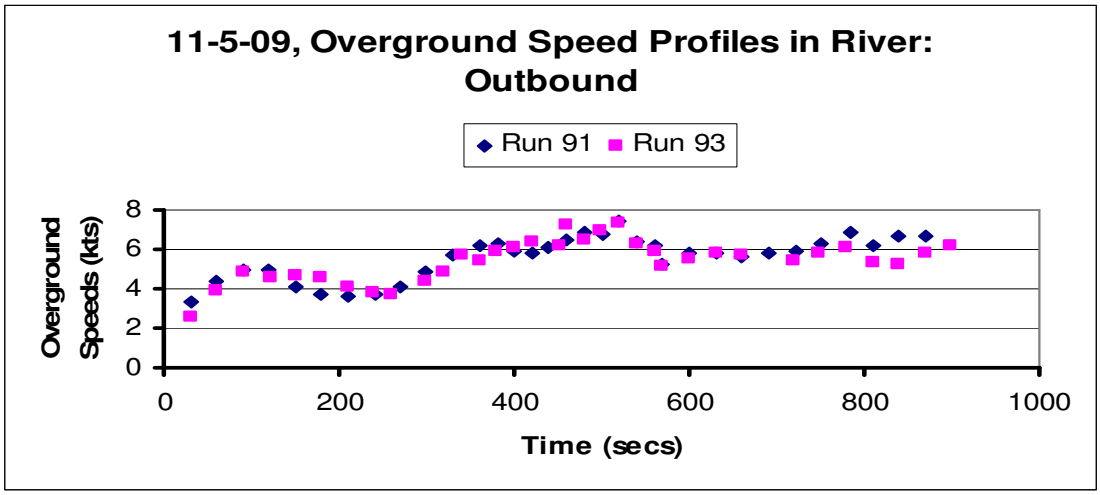
Figure 7: Fourth Observed Run (Run 94): Inbound

The following comments relate to these tracks:

- In the two outbound runs, the ferry kept well to the starboard side of the channel. As there was no obvious sign of departure from the normal track elsewhere in the river, it is assumed that this behaviour is due rather more to the strong ebb running across Long Reach than the easterly wind;
- Drift angles used in Long Reach were comparatively small (of the order of 6° to 10° in the first outbound run) and there was adequate water space left for other, inbound, craft. In the second and third runs drift angles were apparent, but in the last run (inbound) when the cross current was low in Long Reach, drift angles were negligible even though the ship speed was lower. Wind speed was undiminished in Long Reach for this final run, which suggests that drift angles are needed more to counter the cross-current than the cross-wind, even allowing for the greater hydrodynamic resistance to the wind at low water;
- The Tar Barrel bend was obviously a challenge outbound and there was a tendency to "hang the stern out" in this region. A similar tendency was apparent outbound at the wave screen, but not at the Cocked Hat bend;
- In the inbound run of Figure 5, occurring when, presumably, there was still some strength in the ebb flow, the ship was rather to port of the channel centreline in Long Reach. A location just to starboard of the channel centre would have been preferable had there been any traffic, but as on the day there was no traffic on the river during the run, such a track is acceptable.

Overground speeds for inbound and outbound runs are shown in Figure 8.

It is seen that ground speeds in excess of 6 knots were measured around 400 seconds into the run, just after rounding Cocked Hat bend. This was within the tolerance level on overground speed which allows for increases due, among other things, to following currents. Both runs 91 and 93 were subject to following mid-ebb currents in Short Reach and a strong following wind on rounding Cocked Hat bend; inbound runs 92 and 94 were subject to heading currents and a strong head wind and their overground speed did not exceed 6 knots at the same location.



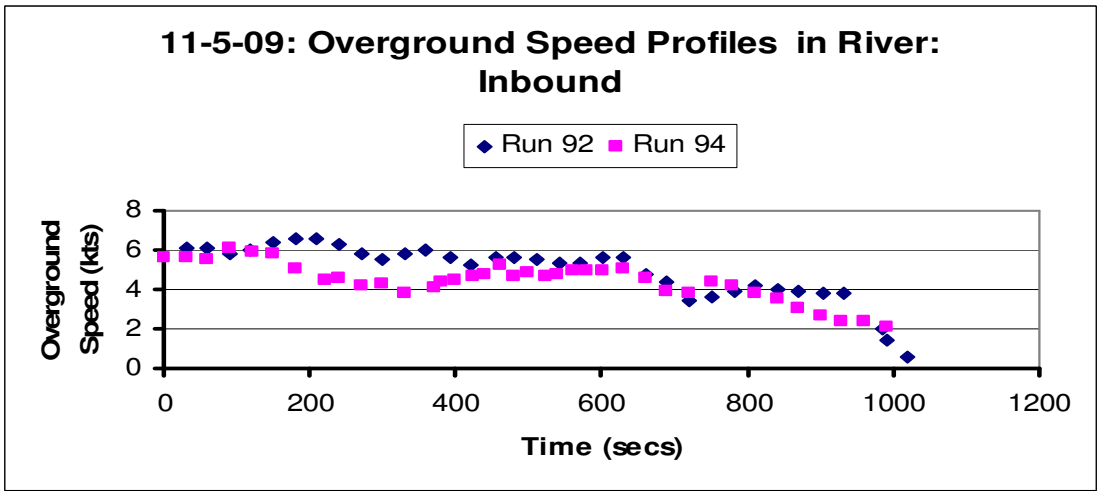
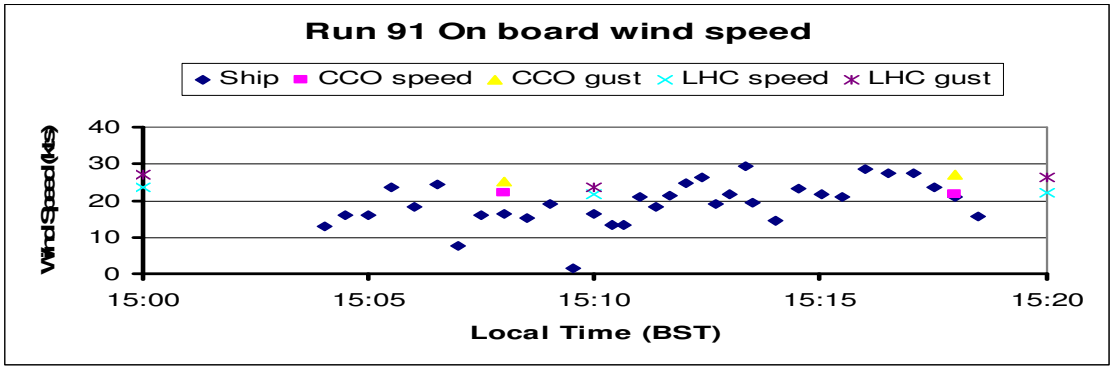


Figure 8: Measured Overground Speeds on 11 May 2009: Wight Sky

In this regard, it was noted on the bridge that ground speeds as measured on the GPS were not called out or asked for by the Master or helmsman. This may be due to the fact that all river passages were conned from the centre position, a location where the helmsman could view the speeds on the GPS display. This was not possible during some of the W-class trials when the tendency was to con the vessel from the bridge wings which required speeds to be called out. It was also noted that, in very nearly all runs on the ferries during the Summer Review, the vessels were conned in the river from the centre location which seems to have become the preferred method.

In the strong wind runs of 3 March 2009 (see Reference 1), wind speeds at the RLymYC Starting Platform were frequently requested by the Masters and given to them by staff at the Lymington Terminal. Such requests for information were not noted on the 11 May runs and it is assumed the Masters used their experience to assess wind speed and keep up-dated on the bridge with MCA weather reports. Figures 9 to 12 show the wind speeds and directions measured on the ferry during each of the four runs.



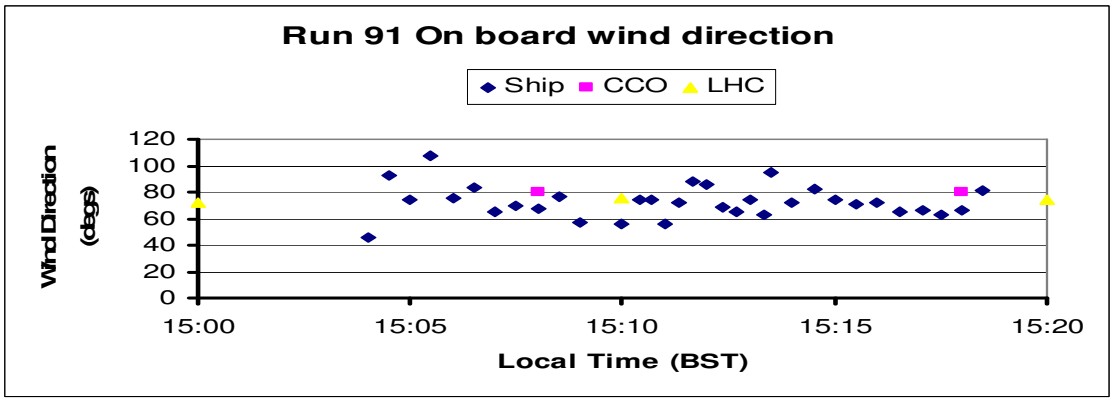
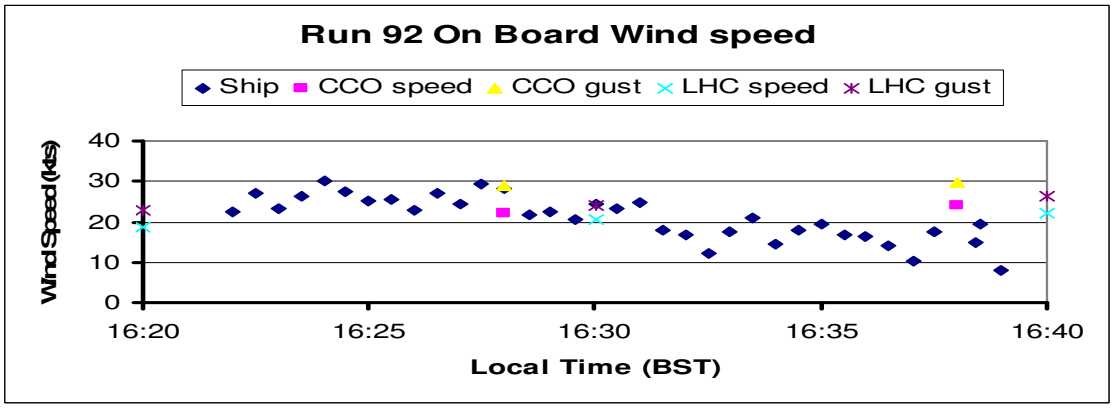


Figure 9: On board Wind Data: First Outbound Run



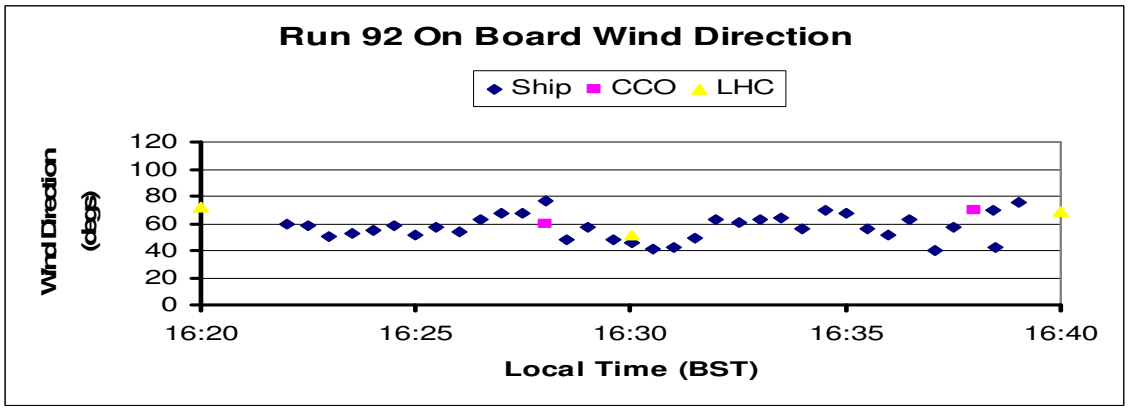


Figure 10: On board Wind Data: First Inbound Run

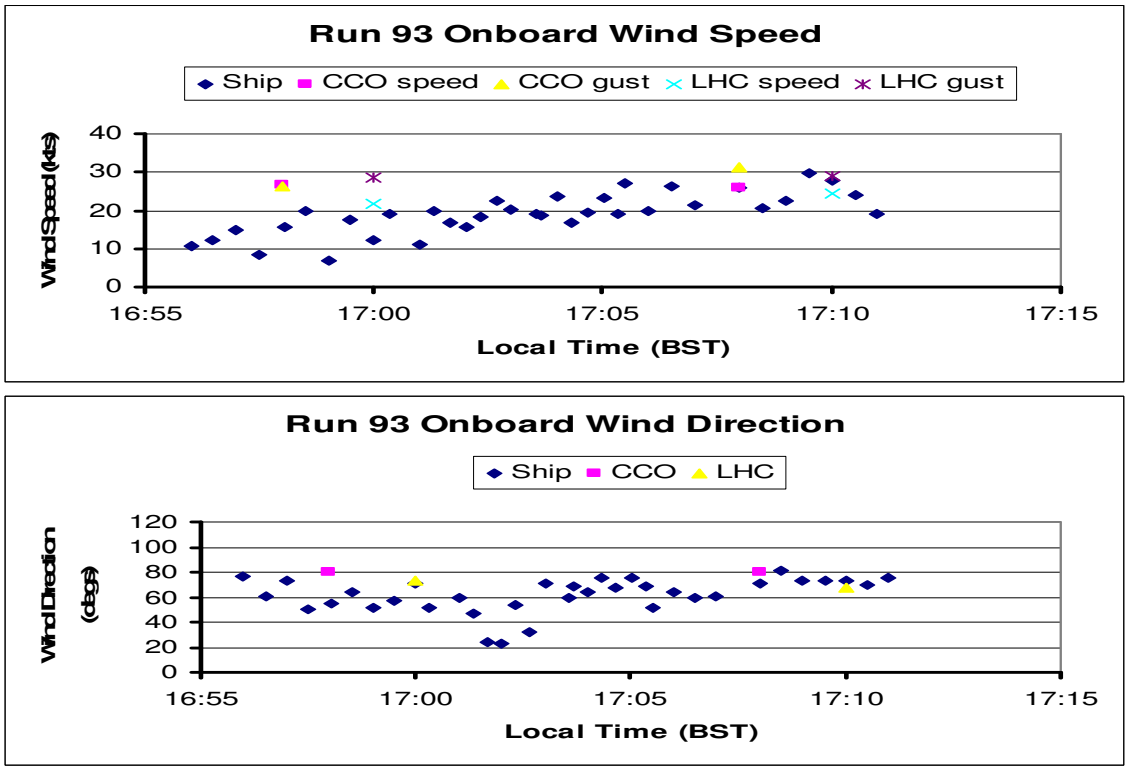


Figure 11: On board Wind Data: Second Outbound Run

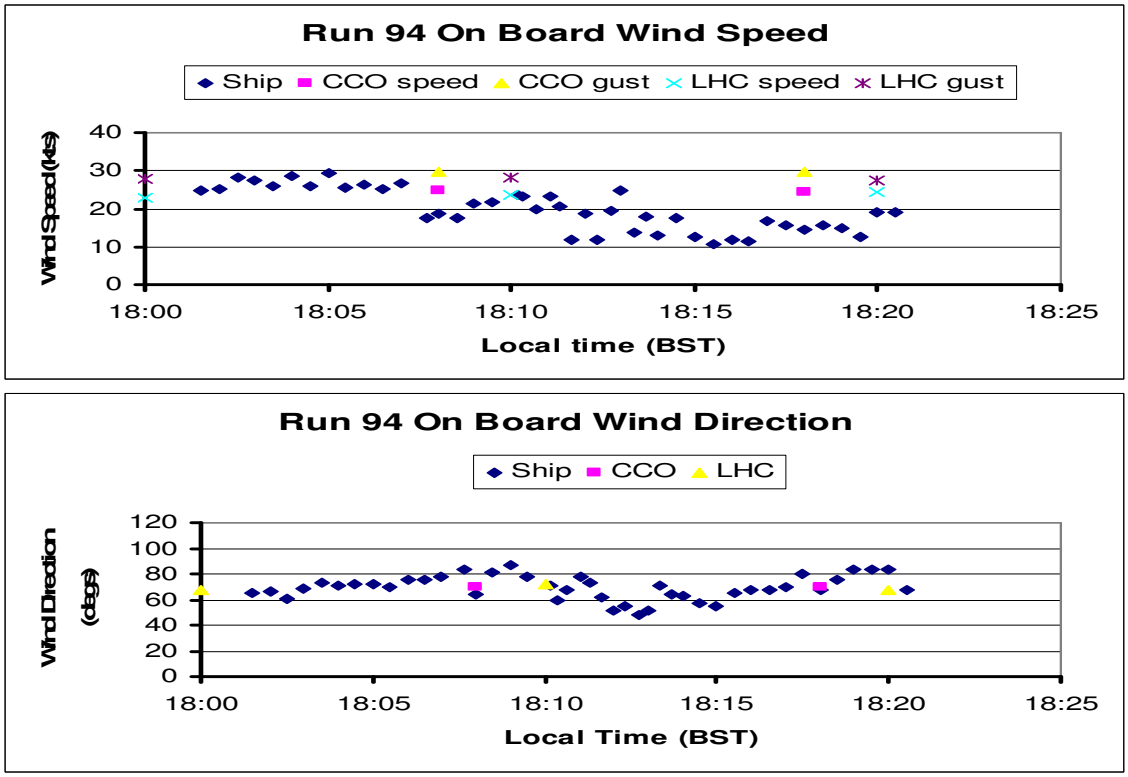


Figure 12: On board Wind Data: Second Inbound Run

The general features of the wind measured on-board are similar to those discussed in Reference 1 for other wind directions. The shelter afforded by the upper reaches of the river is apparent in the reduction of wind speed at the start of the outbound runs and the finish of those inbound. Changes of wind direction of the order of 20^{o} are also apparent in both inbound and outbound runs on the approach to the Cocked Hat bend. This is probably due to shielding of the on-board anemometer by the superstructure at a time when the ship is roughly aligned with the wind.

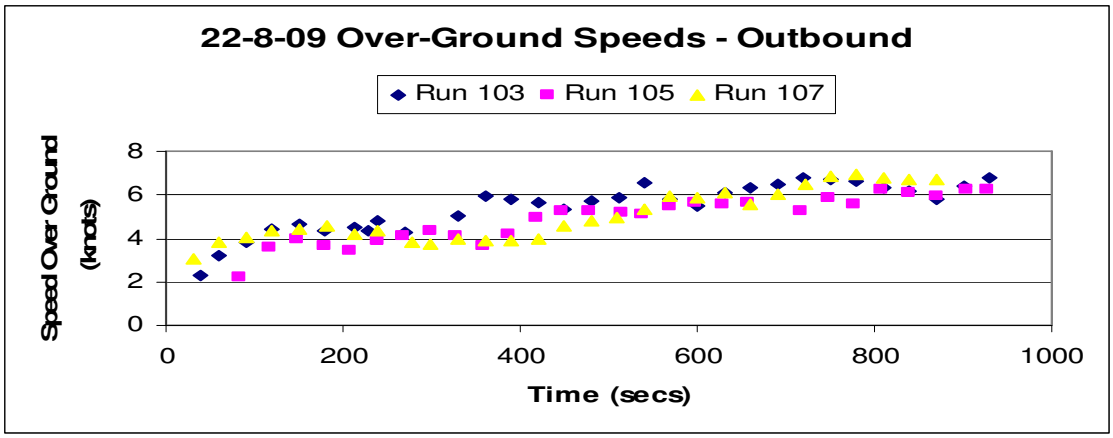
Summary

In general the easterly wind, combined with a strong ebb flow, did not pose significant handling problems. Inbound and in the absence of traffic, the track was positioned slightly to port in Long Reach, but outbound it was taken well to starboard, leaving sufficient water space for inbound craft. Drift angles were quite modest and there was no tendency for the vessel to crab significantly across Long Reach.

It was apparent that the cross current was probably more of a challenge to ship handling than the wind.

5.1.2 - Speeds on the River

Figure 8 shows measured over-ground speeds on 11 May 2009 while Figure 13 shows speed data for inbound and outbound runs on 22 August.



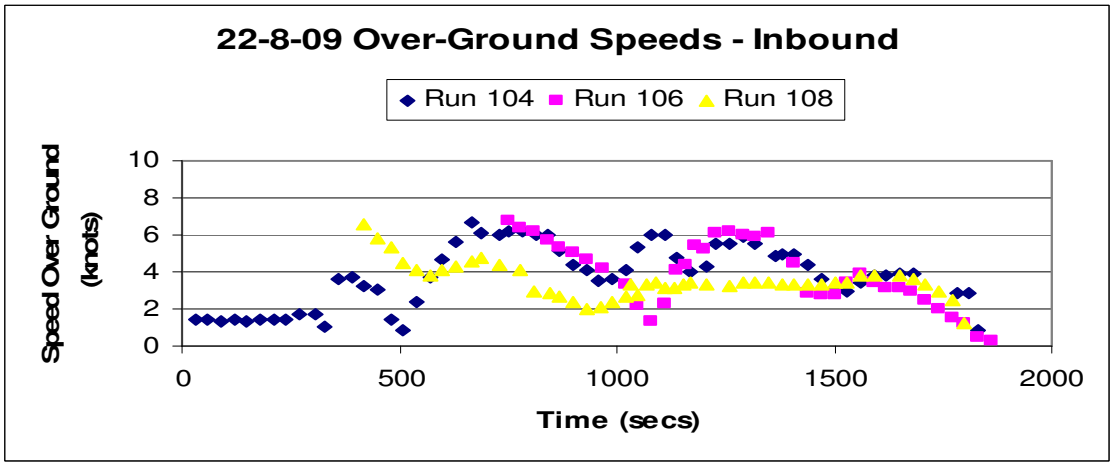


Figure 13: Measured Ground Speeds on 22 August 2009: Wight Light.

On the August visit, three inbound and three outbound runs were witnessed. A high spring tide was running, although winds were light from a south-westerly direction, backing to southerly.

There is a similarity between the results for the outbound runs of Figures 8 and 13, with overground speeds in Short Reach less than 6 knots and slightly greater in Long Reach. Low speeds of 4 knots were maintained to Cocked Hat in runs 105 and 107 as the Wight Light was waiting for the inbound vessel to pass in the Short Reach lay-by. Only in run 107 was a following, ebb, current likely to have been felt.

Low speeds were recorded at times in all the inbound runs. Run 104 began with a lengthy wait of some 5.5 minutes outside the river until the outbound ship sailed. During this wait speeds were around 1.4 knots overground, arising in part from the combined effects of the wind and the local current in the Solent at the time (Figure 14).

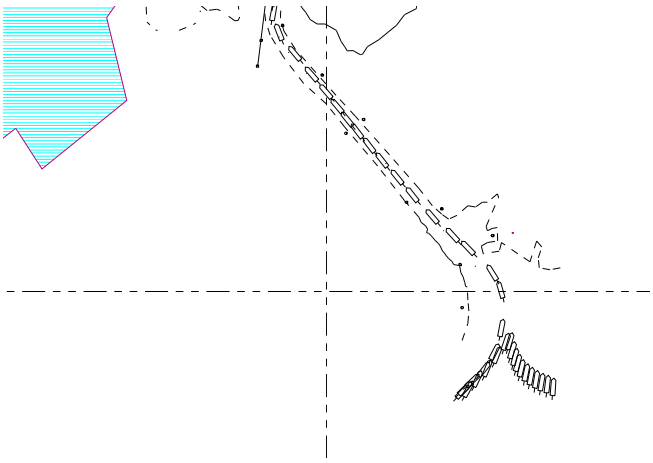


Figure 14: Wight Light Waiting at River Mouth on 22 August 2009. Run 104

In run 104, after achieving about 4 knots in Long Reach, the ferry had to drop speed to allow the outbound boat to arrive at the Lay-by, after which speed increased during the passing manoeuvre, then dropped on rounding Cocked Hat. It was then increased again on exit from the Cocked Hat bend until 6 knots was reached in the vicinity of the wave screen, after which there was a final speed reduction to 4 knots or less in Horn Reach.

Speed reductions in the lay-by area in Run 106 arose from the need to time the passing manoeuvre, and the overall low speed in Run 108 was occasioned by the very low spring tide at the time.

It is clear that the bridge teams have familiarised themselves with the W-class vessels so that they are now able to reach 6 knots during the river transit for longer periods of time than was the practice in the training runs and trials. In the examples shown above, it is clear that there was a tendency slightly to exceed 6 knots overground in Long Reach and, on occasions, elsewhere in the river.

Having said this, the measured overground speeds were well below the tolerance level set by LHC to allow for the variation between overground speeds and the through water speeds upon which the Byelaws are based.

Summary

Overground speeds in the river were generally close to 6 knots, but they were frequently lower due to the need to adjust position for passing manoeuvres. Speed tolerances should remain unchanged until the next review. Now that masters are more familiar with the W-class ferries, they should ensure that they maintain their good compliance with the speed limits.

5.1.3 Berthing

Berthing at Lymington causes thruster slipstreams to form in the path of passing leisure craft. It is understandable that leisure craft held up astern of an inbound ferry as it slows to approach the berth would wish to pass once it heads to the linkspan at Lymington. However, it should be noted that the following considerations apply:

In the final berthing manoeuvres, some masters prefer to set the thrusters to the "half"/"half" setting, changing at approximately the location of the RLymYC clubhouse. This gives them a better balanced control, especially when some "backing and filling" is required, because they have the same thrust response bow and stern. This technique is commonly used in easterly winds and, on occasions in other winds as required. It is also used when moving the ferries between the Lymington lay-by berths and the linkspan. Such a setting will create stronger slipstreams at the stern than the "full"/"slow" combination.

In order to manoeuvre into the linkspan it is necessary to move the stern to starboard which means that the aft thruster slipstream passes across the path of passing leisure vessels at a time when the water space between the ferry stern and adjacent moored yachts may be limited. This can compromise the passing leisure craft.

In an easterly wind, it proved difficult to hold the stern of the W-class on the berth at either Lymington (because necessary berth modifications have not been carried out) or Yarmouth. At the latter it is not uncommon to keep the stern thruster in action while berthed; a similar action was observed at Lymington on occasions. This is in contravention to the assertion that the W-class thrusters and engines would be shut down whenever the ships were berthed and secured alongside. This issue was dealt with for the Lymington Terminal at a meeting between LHC and Wightlink in early July where it was agreed that additional aft breast lines would be used as necessary to avoid the need for thrust, other than in exceptional circumstances. Agreement was also reached that, if such circumstances arose, and additional thruster action was needed, a look-out will be posted on the outboard bridge wing to stop the thruster if leisure craft are approaching. This procedure will continue until the Lymington berth has been modified.

When berthing at Lymington, a heaving line is sent ashore for the stern breast mooring lines. In a strong easterly wind it is not uncommon for the heaving line failing to make it to the shore so that it has to be cast again. This delays mooring, thereby ensuring a prolonged bout of thruster slipstream effects. It is suggested that an improvement of the heaving line and/or the heaving technique be sought.

5.1.4 Adherence to the Collision Regulations

The ferries observed in the Review generally adhered to the Collision Regulations with regard to:

- Lane discipline in the river when they stayed to starboard of the channel centreline where possible. Exceptions to this occurred in strong cross currents in Long Reach and when they followed the normal ferry routes at or near the Wave Screen (number 11 post), Cocked Hat and Tar Barrel at which locations they generally

stayed close to the inside of the bends if traffic conditions permitted; such a track helped the exit from the bends and improved the set-up for the next. This generalisation depends, of course, on the weather and tidal conditions prevailing at the time and Figures 4 and 6 show that the track was to the outside of the channel at Tar Barrel in the easterly wind and ebb flow met on the day;

- Giving way to sailing vessels when racing across the course of the ferry in the Solent as indicated in Figure 15;
- Using sound signals when appropriate;
- Passing other ferries, a manoeuvre which was conducted without problems. On the few occasions when leisure craft overtook a ferry, the master and helmsmen were made aware of the fact by the bridge wing lookouts; the ferry maintained course on such occasions;
- Adherence to Collision Regulations with regard to other ships passing in the Solent was satisfactory, but it was noted that passing sister ships in the Solent was carried out "green to green" or "red to red" depending on whether the local tide was flooding or ebbing.

Figure 15: Wight Sun giving way to Sailing Vessels from starboard in Solent

5.1.5 Effect of Traffic Density and Water Space

Analysis of the tide tables for the sailing season for 2009 (taken to be from the beginning of June to the end of September) revealed that on 7 occasions a tide height less than a metre occurred in the late afternoon or evening when returning leisure traffic might have been expected to be at its densest. These occasions occurred twice and in groups: the periods 21 to 23 August and 18 to 21 September. For the rest of the season, tidal levels at times of high traffic densities were relatively high, as indicated by the results for the Review periods in Table 2. Furthermore, the combined probability that a ferry will move in the river at a very low water with high traffic density is itself very low, although such an event was witnessed on the 22 August, selected as the most likely date in the season for this to occur.

It was noted that, when a sailing regatta or evening racing was on, the fleet moved down the river to the Solent in packets of locally high density traffic. On most occasions these packets managed to move down-river between ferry sailings so that they were clear by the time a ferry made its river passage. Figure 16 shows a packet of high-density traffic moving ahead of a ferry in Long Reach.

With gaps left in the traffic, navigation of the ferry in a "gap" was straightforward and, provided a watch was kept by the sailing craft against the effects of wind shadow, both ferry and out-bound sailing vessels appeared to co-exist satisfactorily on the river.

Inbound ferries either missed the packets altogether (and moved up-river in the gaps), or the schedule was such that no ferry passed up-river when the sailing fleet was outbound.

Figure 16: Packet of High-density Traffic moving down Long Reach at 18:47 on 24 June

For starts and races in Horn Reach, the ferry generally took account of any impending starts and waited until the fleet was underway, or the starts were timed to avoid ferry sailing times. Figure 17 shows a start of a dinghy race in Horn Reach with the ferry still berthed.

Figure 17: Dinghy Race Start in Horn Reach at 18:30 on 24 June

After racing had finished, leisure craft movements back up-river were less predictable, because the length of the race and the frequency with which the craft of the various classes finish are in themselves less predictable. However, because boats finish a race over a period of time, the traffic density returning up-river tended to be less than that going down-river for the start. There was therefore less traffic density, and the "packets" of traffic were replaced by a lower density stream.

Observations suggested that in general these streams of leisure craft obeyed the ColRegs and stayed on the starboard side of the navigation channel, or sailed outside it if there was sufficient water. This was not always the case and some rogue vessels (especially those that were sail only) strayed on to the wrong side of the channel. However, the combined presence of the on-coming ferry, and Harbour Master patrols reminding users of the correct procedures, resulted in very few, if any, conflicts during the Review visits. Due to the high tidal levels encountered during the visits, there was often enough water space outside the navigation posts for the sail-only vessels to keep out of the main navigation channel.

When traffic density in the river was high, lookouts were posted on the bridge wings of the ferries visited by the BMT team and these kept the master and helmsmen informed of nearby vessels. In addition, the bridge radar display showed the sailing vessels in and around the ferry; Figure 18 shows an example with traffic in the river and in the Solent.

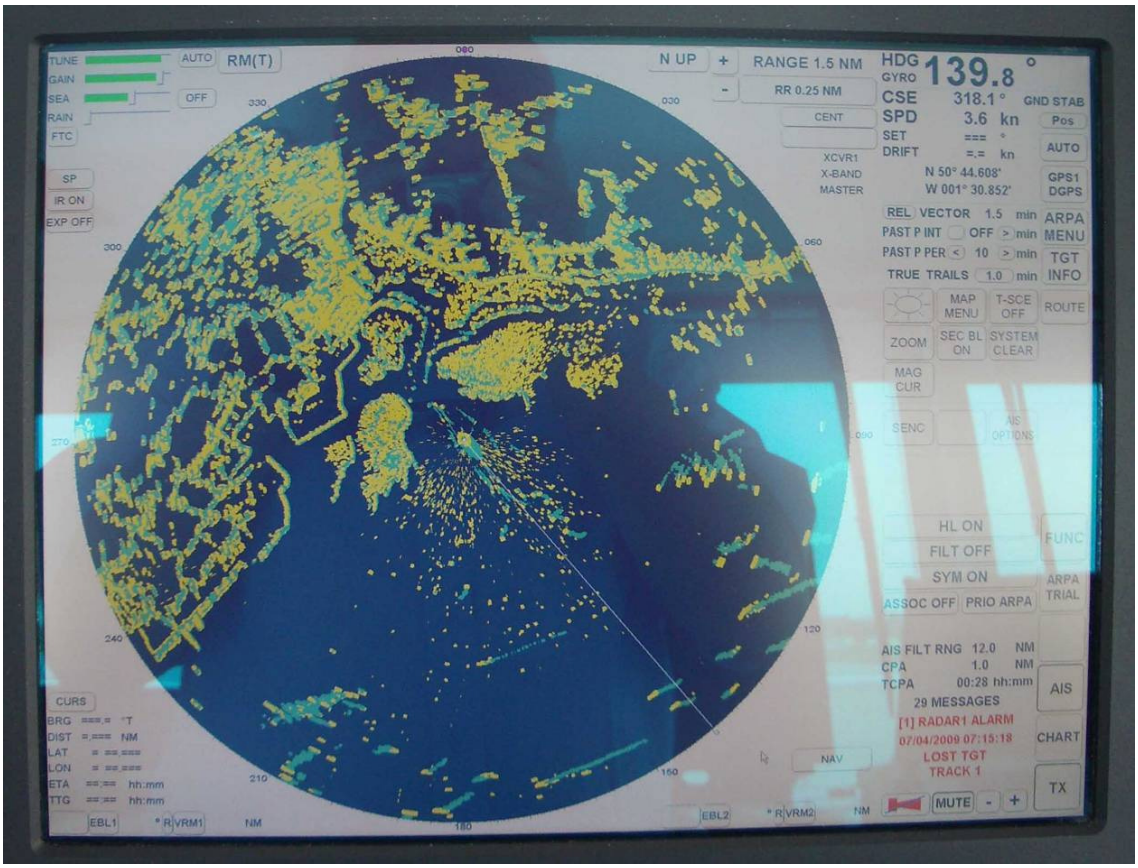


Figure 18: Bridge Radar Display at 13:25 on 4 July

Although such information was available, in the good visibility conditions prevailing, it was easy to assess the traffic density visually from the bridge, or on the river.

One inbound passage at very low water was witnessed on board the Wight Light. This occurred in the late afternoon when leisure traffic was returning to the river, most of which lined astern of the ferry and followed it in (see Figure 19).

Figure 19: Leisure Craft Following the inbound Ferry at LWS (18:26 BST) on 22 August

The photo of Figure 19 was taken at LWS in the Short Reach Lay-by area; eight craft are in the queue, each with about 20 or 50 metre headways (the longitudinal bow-to-bow distance) and some 15 to 20 metres lateral separation. There would appear to be adequate water space for the leisure craft; all were motoring in and all were in the ferry wake. These positions astern of the ferry remained roughly the same as the convoy proceeded upriver at a speed of around 4 knots or less (see run 108 results in Figure 13), a speed which was deemed prudent by the master to be safe for navigation at such a low tide. Discipline from the leisure users was good, but the result was, no doubt, a degree of frustration at the slow progress and a desire among those whose berths were up river past the ferry terminal to pass the ferry as it commenced its berthing manoeuvres; this is shown in Figure 20.

As can be seen, such an action runs the risk of leisure craft passing through the slipstream from the aft thruster as the stern is being manoeuvred into the berth and made fast, a time when all the master's attention is on the berthing rather than passing leisure craft.

Finally, although it is possible to recommend that racing starts should be timed to avoid ferry sailings, it is only possible to do this when the ferries operate to a known and predictable schedule. As mentioned above, this is not always possible due to operational delays which occur for a variety of reasons and result in the schedule being seriously disrupted. This further means that ferries have to wait near the river mouth where they can find themselves in the way of leisure users passing in to or out of the river. This state of affairs was witnessed frequently over the sailing season and it was notable how most of the ferry bridge teams and most of the leisure users, by using a combination of good seamanship and common sense, were able to solve these operational problems on the spot.

Figure 20: Leisure Craft passing Berthing Ferry at LWS (18:37 BST) on 22 August

Summary

It is clear that the structure of the leisure craft traffic is such that it is possible for the ferries to run in the gaps between packets of the densest traffic outbound; inbound the traffic densities were reduced and good lane discipline, combined with adequate water space due to the preponderance of higher water conditions, allowed the ferry and other users, including the sail-only craft, to occupy the river together safely. This, and good seamanship, combined with common sense on the part of most ferry crews and leisure users, resulted in no real conflicts between ferry and users during the observation periods.

5.1.6 Ferry Wash, Wake and Thruster Usage

The wave system from the W-class hull contains small waves, as discussed at length in Reference 1. Wave wash from the ferries was not therefore a problem during the review period and was generally far less than that of some of the small commercial and recreational craft using the river. This was also discussed in Reference 1.

The wake of the ferry was of concern during the early trials in Phase 2 and led to the requirement for certain thruster speed settings to be used in various wind conditions, as listed in the LHC Safe Operating Profile for the W-class ferries. These, combined with an additional ("half") speed setting fitted to all members of the class, considerably improved the wake to levels which were acceptable for small craft.

In normal ahead motion, the wake itself derives from the slipstreams of the thrusters and is characterised by a central core of large scale eddying flow below a generally flat free surface, bounded by shear planes of quite high-intensity vorticity. The energy in the wake is felt by small craft passing through it, but in general most leisure users who know what to expect seem able to deal with it and retain an adequate measure of control. During the Review particular attention was paid to those leisure craft navigating

in the wake or on its boundaries. A surprising number of craft seemed drawn to the shear planes, but whereas some loss of control was observed, in all cases control was soon regained.

This was especially true when a queue of leisure craft followed the ferry in to Lymington as shown in Figure 19 where it may be seen that most of the following craft are in the ferry wake. All were able to hold station without any lasting deviations off course.

On one occasion it was noticed that a master used the "full"/"half" speed setting when the wind conditions arguably merited a "full"/"slow" setting. In such cases the energy in the wake and the resultant disturbance is more severe, resulting in more effect on following craft.

5.1.7 Scheduling, Timetables and Operating Together

Although it is not the purpose of this review to attempt any discussion of appropriate ferry scheduling and timetabling, it is worth mentioning that on no occasion when there was a three-boat operation during the observation period was the published timetable adhered to. Various operational matters, many outwith the control of the masters (on one occasion at Yarmouth, it took over 8 minutes to unload due to congestion on the quay), conspired to prevent this happening and the consequence was invariably the need for a ferry to wait at or near the mouth of the river. In at least one case, this occurred in spite of the master making a deliberately slow passage across the Solent.

By contrast the two-boat hourly service was able to hold to the published timetable well, except when it followed a period of three-boat operation when some "catching up" was needed. However, it is not clear whether it was possible to re-establish the published schedule on any particular day.

The reason for concern about this is that it makes it almost impossible to time river or Solent racing to fit in with ferry passage along the river. This naturally provides a potential for more conflict situations in busy periods.

Having said that, however, there is a distinct "feel" on the river that both parties – the ferry operators and the leisure users – are finding ways of operating together in spite of the scheduling problems. It was notable, for example, that yachts were seen to wait outside the wave screen for outbound ferries to pass through and the way in which ferries gave way to a sailing fleet racing in the Solent has already been mentioned. It was also noted that bridge teams visually acknowledged any give-way manoeuvre by a leisure user and also acknowledged and apologised (by signs from the bridge) if the ferry had impeded a leisure user in any way.

5.1.8 Various Operational Matters

In this Section a number of minor operational matters, which were subject to review, are mentioned.

Ensign Discipline

Ensign discipline was generally good, although there was one occasion when the ferry under observation carried no ensign or house flag for the entire observation period. Moreover, on one occasion a ferry was seen passing down-river with the ensign on the ("Yarmouth" end) foremast.

With a double-ended ferry, ensign discipline is of some importance in alerting leisure users to the direction the ferry is travelling, or intending to travel. When it is realised that a yacht entering the river may need to determine whether a ferry near Cocked Hat is inbound or outbound, then simple observation of the ensign can provide the required information.

Bow Ramp Checks

It was noted on the 30 July incognito check that access to lookout platforms have now been provided at both ends of the ferries instead of at the "Yarmouth" end only. This is welcomed as it gives the master the option of posting a crew member at either end of the ship to report on activities nearby in the water, or in reduced visibility.

Visual checks were also made from the Sun Deck where it was possible to see the bow ramp checks being undertaken; at the Lymington terminal this was done by a crew member climbing to the lookout platform, and at Yarmouth by the shore mooring crew (see the report for the 30 July observations in Appendix 1)

Hand-Over of the Con

Hand-over of the con from the centre of the bridge to the wings or vice versa gave problems once (on 11 May just outside Yarmouth) when BMT were on the bridge. Otherwise all hand-overs went well without a hitch, helped no doubt by a modification introduced in early July which provided a greater tolerance in the control electronics. It was clear that all observed helmsmen preferred to con from the centre position in the river and Solent with most, but not all, berthing at Lymington from the starboard bridge wing and most berthing at Yarmouth from the port wing.

Ganging Thruster Controls

In Reference 1, a suggestion was made that consideration be given to ganging together the thruster steering controls to mimic the system used on the C-class. This would be a control option, capable of being used as and when required. During the review period, however, only one helmsman expressed the view that he missed this control option and it was clear that all helmsmen had become accustomed to the W-class controls. It was also clear that new helmsmen were being trained who had no experience of the C-class and who, presumably, would have no knowledge of the ganging option. In view of these considerations, it would appear that if, on the next review, there was no significant desire for the ganging option, the suggestion could be dropped.

Sound Signals

Sound signals were satisfactory and used as required. For example, they were used if there was traffic near to the Lymington terminal before departure; if there was no traffic around they were not.

Bridge Team Numbers

Numbers of crew on the bridge were quite high on some of the review days because new helmsmen were being trained. In general a minimum of three were present, supplemented when necessary by one more so that lookouts were posted on both bridge wings. This was done at times of high traffic densities both in the river and in the Solent when the lookouts called distances and informed the master of nearby boats and their probable intentions. Bridge team numbers were therefore considered to be satisfactory.

Communications

Communications, both ferry/ferry and ferry/leisure user, were raised as an issue in Reference 1. During the review period, knowledge of what the other ferries were doing was of some importance, especially when the schedule had been lost. This was accomplished in the main by tuning in to the crew's hand-held radios and the GPS ship list for berthed ships; the former gave notice of loading progress on other berthed vessels and any problems, while the latter indicated whether and when the ship had sailed.

When necessary, mobile phones were used between masters to set up passing manoeuvres in the Lay-by or, on one occasion, to set up a sequence of manoeuvres at the Lymington terminal to allow a ship to come off the Freshwater Berth and enter service as the "middle turn".

Communications with leisure users were attempted by hand signals from the bridge. These, while well-meant, may not have been seen by users due to both the height of the bridge and the reflections from the bridge windows.

It has been mentioned above that, during the review periods, on only one occasion were medium-to-strong winds encountered and the master was not heard seeking wind information from the terminal, but instead was using his experience and forecast information obtained from MCA broadcasts. It is understood, however, that the ferry terminal has access to the datum wind data from the RLymYC starting platform.

In general, however, it was felt that communications had improved since the trials and the early days in service.

Consideration for Other River Users

The BMT team were impressed by the consideration shown by most Wightlink masters and bridge teams for other river users. An example occurred at the Lymington terminal when a manoeuvre from the South End berth to the linkspan saw the master deliberately delay using his thrusters (even though he wished to use them) because of the presence a nearby yacht.

However, a tendency for the ferries to stay close to the west side of the river when passing was still in evidence. This is acceptable in conditions where leisure traffic is not inconvenienced, but if this is not the case it would be preferable for the ferries to remain on the leads when passing and to starboard of the river centreline when no passing takes place.

Use of Leading Lines/Transit Lines

It was observed that when no passing took place in the river, the ferry generally stayed on or inside the leading/transit lines, whereas when passing took place the outbound ferry invariably manoeuvred outside the leads, regardless of tide height. The inbound passing ferry was generally on or inside the leads for higher tidal states, but outside the leads at low water springs (Figure 21). It was recommended in Reference 1 that, when there is leisure traffic likely to be inconvenienced, ferries should stay on the leads to provide enough water space for leisure craft; this still applies.

5.1.9 Adherence to the Safe Operating Profile

The Safe Operating Profile was developed to ensure that excessive disturbance to leisure users from ferry wash and thruster activity was reduced to an acceptable minimum. In addition, the profile required no waiting in the river, thrusters are to be shut down when a ferry is berthed and passing in the Lay-by is allowed.

During the review period, observations showed that the SOP was being adhered to although the following comments may be made:

- On one occasion in marginal conditions, the "full"/"half" setting was kept slightly longer than necessary when the wind had dropped below the prescribed threshold. It appeared that some masters preferred this setting as it gave them a feeling of greater control, but it should be noted that the "full"/"slow" setting for winds less than 25 knots has been extensively trialled and demonstrated satisfactory levels of control throughout. In calmer conditions the "full"/"half" setting causes more disturbance to leisure craft in the river and the "full"/"slow" setting should be the preferred option;
- In a strong enough easterly wind, as stated above, the aft thruster was needed to hold the stern against the jetty at Lymington and Yarmouth. This is contrary to the requirement for thrusters to be stopped while on the berth and has been addressed. As mentioned in Section 5.1.3, use of additional aft breast lines at Lymington is now required before considering the use of thrust. If thrust is required in exceptional circumstances, procedures require a lookout to be present on the starboard (channel side) bridge wing to observe that thrust levels are kept to a minimum and to switch

the thrust off if other craft are passing the berth. These procedures will remain in place until berth modifications are complete at which time procedures will be reviewed;

- All passing manoeuvres took place without incident, passing speeds being of the order of 6 knots at higher tidal levels and 4 knots at low water springs. One Long Reach pass was witnessed; it was at high water and no leisure traffic was inconvenienced;
- Only once was there any example of waiting in the river; this occurred with an inbound ferry and the event was admitted by the Master as an error of judgement occasioned by too early an entry to the river and an incorrect speed in Long Reach. On all other occasions when waiting was necessary, it was conducted in the Solent, off the river mouth.

5.2 Leisure User Operations

5.2.1 Wind Shadow

Wind shadows from the W-class ferries were measured and discussed at some length in Reference 1. Their effects last for longer than those from the C-class and, as with the C-class, wind direction as well as speed, can change significantly when a leisure craft is within the shadow.

In most cases leisure users dealt with wind shadow effects well; they suffered loss of wind and some control, but managed to weather this in the knowledge that normal wind conditions would shortly resume. Many of the users most vulnerable to wind shadow (dinghies, for example) kept as far from the ferries as possible, except on one observed occasion when a capsize occurred.

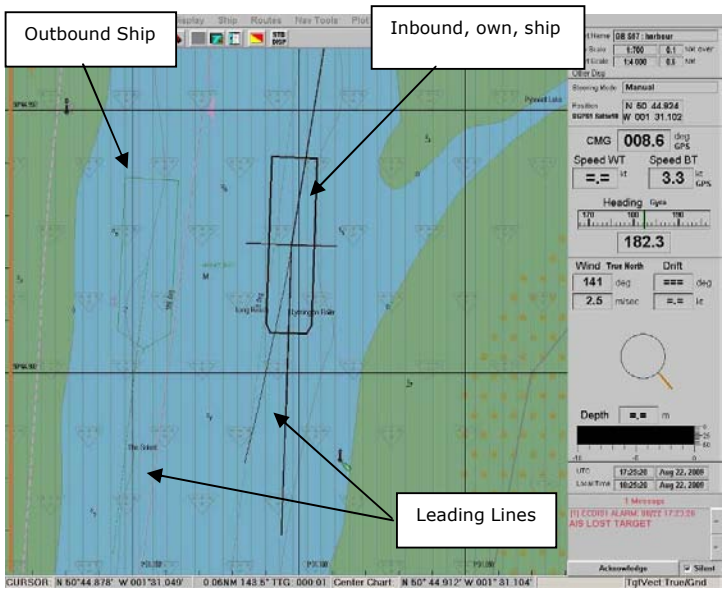


Figure 21: Use of Leading Lines on LWS Pass; both Ferries Outside Leads.

This took place on 4 July when a regatta of RS sailing dinghies was hosted by the LTSC. On returning to the river, a number of these dinghies were following an inbound ferry as it approached the Lay-by area prior to passing an outbound ferry (see Figure 22).

Figure 22: Wight Light (on the right) and Wight Sky passing

At this time (1743 BST) the mean wind was about 10 to 15 knots from a south-westerly direction and two RS dinghies can be seen off the Wight Sky's port quarter, flying spinnakers and reaching. The crews in two of these dinghies were seen to be standing in the boat or on the weather outriggers. What happened next vividly demonstrated the effect of the ferry wind shadow on high-performance sailing dinghies.

Once the two ferries had passed, the RS dinghies moved out to the port side of the inbound ferry, with the intention of overtaking it. As they did so, they moved into the wind shadow of the outbound ferry and not only suffered a loss of wind speed, but also a large, and temporary, change in wind direction. Such effects were illustrated in some detail in Figures A5.9, A5.10 and A5.11 of Reference 1 which show measurements of changes in wind direction of the order of 150^{o} or more in wind shadows from both the C- and W-classes. This effective reversal of wind direction, combined with the fact that the crews of the RS dinghies were sitting well out when the wind dropped and reversed, caused the three boats concerned heel rapidly to "windward", one after the other. This sequence is shown in Figure 23.

The progressive nature of the incident can be seen clearly from the sequence, as can the fact that, in the last of the sequence, the first boat of the three is in clearer wind and beginning to reach away. All three boats recovered well and none of them capsized.

Figure 23: Effect of Ferry Wind Shadow on three RS dinghies

The same could not be said for the next group of RS dinghies, seen in the background of the photos in Figure 23 and moving up-river on a reach without spinnakers set. Having seen their fellow sailors caught in the ferry wind shadow, they were caught in the same way as they passed the outbound Wight Light, the ferry by this time having rounded the Tar Barrel mark. The same progressive loss of wind occurred and one of the dinghies in the group did in fact capsize as shown in Figure 24.

Figure 24: Capsized RS dinghy

It was soon righted by the crew who resumed sailing with, apparently, no ill effects.

A passing comment on these incidents seems appropriate. Much has been said about wind shadow from the W-class ferries in the past year, but it is possible that the crews of the RS dinghies involved in the above incidents were unaware of these effects near a ferry, or indeed from which direction, relative to the ferry, the wind would come; as they were taking part in an open meeting, they may well not have been local to the area and were therefore unfamiliar with such effects. Nevertheless, they also sailed in to the shadow with, in some cases, all sail set in a good sailing breeze with their crew deployed to counter the no doubt significant heeling moment from the sails. Loss of wind (and reversal of its direction) was therefore bound to cause a dramatic heel to windward, a consequence demonstrated only too vividly on the river. It would seem not unreasonable to expect dinghy sailors to anticipate the effects of the shadow and be ready to deal with them by sailing rather more circumspectly in the vicinity of the ferries. In this incident it was apparent that there was enough water outside the channel to windward, so there was no real need to pass between the ferries.

When boats cannot keep away from the ferries, they are more prone to the effects of wind shadow and slipstream effects; this was demonstrated on the same day when the Wight Light was approaching the Lymington linkspan and about to berth. A Folkboat was seen to be tacking down-river in the vicinity of the terminal and, having completed a tack on the west side of the channel and having no room to tack again, it used its momentum to pass between the berthing ferry and the moored yachts. Having virtually no control, it was at the mercy of the wind as affected by the ferry, and its thruster slipstreams which were in operation while berthing. This resulted in the yacht being turned at right angles so that, at the time the photo in Figure 25 was taken, it was moving slowly toward a moored yacht. It was fended off and turned manually by the crew member on the bow, after which it caught the steady wind again and continued tacking down-river. It is not clear whether, having seen the Folkboat initially, this part of the incident was witnessed by the bridge team on the ferry.

It is fair to say that these two incidents were the exception rather than the rule during the Review period, but it is clear that it is necessary to anticipate what is likely to

happen in the wind shadow (c.f. the RS dinghy incident) and, if possible, avoid sailing past a ferry while it is berthing at the Lymington linkspan (c.f. the Folkboat incident).

Figure 25: Folkboat in Wind Shadow

5.2.2 Adherence to Collision Regulations and Speed Limits

In general it was apparent that users complied with the lane discipline requirements in the ColRegs. This was helped by the Harbour Master's patrols which encouraged users both to keep to the right side of the channel and maintain a proper speed. The presence of a ferry approaching from ahead or astern was also a powerful motivating factor in causing users to keep to the right side of the river as Figures 26 and 27 demonstrate.

There were some instances of boats cutting across the path of the ferries in the river, but, although some could be classed as "impeding a ferry" (a vessel constrained by its draught) there were no significant safety issues. However, it remains a recommendation for leisure craft to keep as far away from the ferries as practicable at all times.

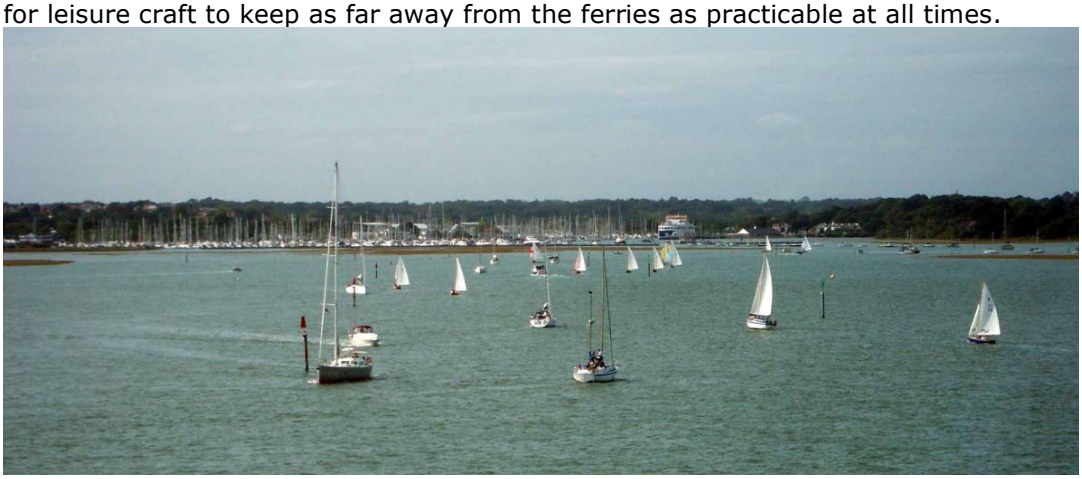


Figure 26: Poor Lane Discipline in Long Reach at 15:55 on 22 August

Figure 27: Improved Lane Discipline in Long Reach at 16:00 on 22 August as Ferry Approaches

Overtaking the ferries was not always satisfactorily carried out and attention is drawn to Rule 13 in the Collision Regulations which applies to river users as well as ferries.

Several cases of excessive speed were observed, and these were largely confined to RIBs moving at planing speeds. The Harbour Master patrols brought these to the attention of those in charge of the RIBs, reminding them of the fact that speed limits on the river apply to all users.

5.2.3 Effect of Ferry Wash and Wake

The ferry wave system was not observed to have any significant effect on leisure users. However, as mentioned in Section 5.1.6, a number were observed to sail in that part of the wake arising from the thruster slipstreams. Although affected, none of the motorised craft were unable to maintain control and no serious incidents involving pure sailing craft, including sailing dinghies, were observed.

5.2.4 Available Water Space

As already established, the tides during the review period at times of expected high traffic density were generally either neap or modest springs. As a result, whenever there were packets of high-density traffic in the river, there was adequate water space in both Short and Long Reaches. Even at a very low spring tide, water space in Short

Reach was not observed to be an issue, although space between bank and ferry would have been increased if passing ferries had stayed on the leading lines.

There is a traffic crossing point at the entrance to the marina near the wave screen and a pinch point just off the ferry berth in Horn Reach. Regarding the former, it now appears to be the case that inbound boats are prepared to wait for a ferry to pass before moving across the river into, or out of, the marina and the ferries will take avoiding action (by adjusting speed) as necessary.

The latter issue is dealt with in the next Section.

5.2.5 Ferry Berthing at Lymington

It has already been mentioned that, when the ferry berths, two things happen:

- The Master's attention is devoted mainly to the berthing of his ferry. Lookouts are (or should be) posted on the bridge wings to draw his attention to events on the river that he is unable to see, but most of his attention is concentrated on the starboard bridge wing berthing console, remote from the side of the vessel where small vessels pass;
- The manoeuvres needed to bring the stern of the ferry to the berthing face result in significant flow from the thruster slipstreams passing across the narrow water space on the ferry's port aft quarter. Once the stern is secure, this flow should stop.

Figure 28 shows the effect of the flow from a ferry while berthing at Lymington. It is obviously significant and can take the unwary across the water space toward the moored boats. It would be prudent to wait before passing a berthing ferry; the water space is restricted and the flow from the ferry can be strong, especially in an easterly wind. Once the stern is secure, the flow across Horn Reach should stop and it would then be safe to pass. This matter has been covered in the LHC Local Notice to Mariners number 11, 2009.

5.2.6 Harbour Master Patrols

Harbour Master patrols were well-liked by the Wightlink masters who remarked that they were of significant benefit. They encouraged compliance with the ColRegs and Byelaws, especially with regard to speed enforcement and the maintenance of good lane discipline in the river.

They were also on hand to witness a number of incidents and give assistance if necessary.

During the incognito visit to the river, a check was made on whether the patrols were in place for the full period of evening sailing; they were (see notes on the 30 July visit in Appendix 1).

These patrols are especially effective when traffic density is high and cover all Reaches in the river as required.

5.2.7 Moorings near Cocked Hat

Figure 29 shows boats moored near Cocked Hat at 12:28 on 22 August.

As discussed in Reference 1, boats on the moorings on the western side of Short Reach near the Cocked Hat post can, under certain conditions of wind and tide, intrude into the navigation channel; an example is shown in Figure 29, taken from a ferry rounding the Cocked Hat bend. In the event, there was little traffic around at the time and, in the high water conditions prevailing, there was little in the way of current; there was also adequate water space and depth. From a navigation perspective, however, it would be preferable if these moorings were not used, especially when the traffic density is high.

Figure 28: Effect of Aft Thruster Slipstream during Ferry Berthing.

5.2.8 Use of Personal Buoyancy Aids

Although not strictly part of the original study, the attention of the BMT team while at Lymington was drawn a number of times to people in small boats on the river without any obvious form of personal buoyancy aids.

While it is agreed that some of these examples may relate to visitors to the river, it is clear that, if an accident were to happen, these people would have their personal safety significantly reduced. While observations suggest that the local marine safety culture is such that wearing personal buoyancy is reasonably widespread (and is indeed required for racing in the sailing clubs' Codes of Practice and is the subject of Local Notice to Mariners number 10 of 2008), other safety measures on the river will be degraded if users do not use personal buoyancy aids.

Figure 29: Boats Moored in Short Reach

5.2.9 Night Vision and Ferry Spotlights

In early trials after dark, the prow lights of the W-class ferries were found to cause problems with the night vision of other river users. This was addressed in a series of trials carried out by the LHC in collaboration with Wightlink as a result of which it was agreed to use the Sun Deck spotlights should be used in preference to the prow lights for river navigation after dark with the additional requirement that spotlights should be switched off when another vessel approaches within 150 metres of the ferry and in the opposite direction.

5.2.10 Wednesday Junior Sailing

During early runs on the ferry on 24 June, Wednesday Junior Sailing (WJS) was either under way or in preparation. On the day a two-boat ferry operation was in place and high water occurred around 13:50 BST. While there was little on-river WJS activity on the first observed ferry run outbound, there was some activity on the return run from Yarmouth an hour and a half later.

The organisation of WJS was excellent as usual and it was noted that the ferry gave a sound signal inbound on approaching the wave screen as well as on its subsequent departure from the terminal. The number of boats involved in WJS was small on the day, but no conflict with the ferries occurred and there seemed little to suggest that the ferries and WJS were not co-existing quite satisfactorily.

5.2.11 Effect of Ferry/Leisure Craft Hydrodynamic Interaction

Hydrodynamic interaction effects between ferries and leisure craft were observed. As the ferry moved along Horn Reach there were often clear examples of interaction on craft moored near the ferry route and these have been discussed in Reference 1. The presence of more traffic on the river had little or no effect on this.

No effect of interaction between passing ferries was seen, the greater effects stemming from the ferry wake, as already discussed.

5.3 Overview

The overall impression gained as a result of the observations made during the review period is that, in general terms, the relationship between the ferries and most of the leisure users on the river had bedded down to a reasonably peaceful co-existence. There were some areas where improvements could be made, but these were relatively minor.

The scheduling of the ferries gave problems, but it seemed that race organisers and users were able to operate around the variable schedules while they were effectively revised on the spot by the masters adapting to a changing situation.

Although there was certainly more traffic on the river than had been the case during the trials described in References 1 and 2, it did not seem to cause either a major disruption to ferry schedules or compromise safety on the river. This was largely because:

- Most tides during the "sailing day" were relatively high, especially prior to a race when boats were heading down-river;
- Due to these high waters, there was often adequate water space in the river outside the navigation channel for small boats;
- Sailing traffic tended to move down river in high-density packets which generally travelled between ferry movements;
- Up-river traffic after racing was naturally more spread out and less dense;
- At very low water, most vessels queued astern of the ferry and restrained the urge to overtake.

As a result, no significant safety issues resulting from traffic density per se were observed.

This was not the case with wind shadow and the example discussed in Section 5.2.1 could perhaps have been avoided with a more detailed pre-race briefing about the consequences of wind shadow from W-class vessels. Also LHC should consider what additional measures can be taken to increase awareness of the effects of wind shadow, using for example, the Harbour Guide, the LHC website, safety leaflets etc.

6 Risk Assessment

In this Section the marine risks on the river are reviewed as a result of the experience gained during the summer sailing season. The Risk Register of Reference 1 is revisited to see if there is any need for change, and progress of compliance with the recommendations made in the same report is assessed.

First, the reported ferry-related safety incidents are reviewed.

6.1 Incident Reports

Before considering the LHC incident reports in detail, it is important to clarify some related matters. The present formalised incident reporting and categorisation system was instigated by LHC in 2007, the year in which this Risk Assessment study began. By 2008 the system was running well and reports of incidents were obtained from users, both commercial and leisure, as well as those witnessed by members of LHC staff on their increased patrols on the river. These patrols have also been able to identify and report incidents which in earlier years might have been unrecorded and unreported.

Reports, once received, are checked for consistency and, where possible, evidence is gathered to substantiate their content. The result of this is that a much greater number of incident reports are now logged showing an increase of all incidents from 35 in 2006 to 155 in 2008; as recognised by the River Users Safety Committee, this is considered to be due more to the improved efficiency of the reporting system rather than any increase in incidents.

The nature of the reporting is such that it identifies incidents on the river of all types, and all are assessed by LHC. This differs from procedures adopted by large commercial ports where accidents involving loss of life, injury, oil and chemical spills and massive damage to property are the main interest. Such information populates the safety statistics from ports worldwide and these provide a picture of the port safety levels across the world. For example, in the port of Hong Kong, marine accidents are categorised by type:

- Collision;
- Stranding/Striking;
- Foundering/Sinking;
- Fire/Explosion;
- Capsize/List;
- Contact;
- Others.

The related statistics are concerned with the number of each type, together with the numbers of persons killed, injured or missing.

These statistics may be compared with the ferry-related incidents in the LHC database. Here, as has been stated before in this study, there are no records of any person being killed or injured on the river for at least the last 12 years. This means that, to assess

the level of safety on the Lymington River, it is not feasible to make meaningful comparisons with risk statistics from large ports world-wide because they use measures related to loss of life, injury etc. In such terms, the operations at Lymington are remarkably safe because there has been no loss of life or injury associated with ferry operations on the river.

However, the incidents recorded at Lymington do serve an important purpose related to safety in that they give an excellent picture of all users' discipline on the river in relation to compliance with the ColRegs, Byelaws and safety advice given in the Harbour booklet. They therefore provide not only an indication of compliance, but also highlight areas of potential risk to which attention may need to be directed.

With this in mind, analysis of the incident records provides a useful picture of behaviour on the river. However, the ten years of statistics from 1998 to the end of 2007, used in Reference 2, are not appropriate because of the new, more comprehensive, formalised reporting system now in use. In the ten year period statistics, 58 ferry-related incidents were recorded, whereas in 2008 the new system recorded 35 up to 30th September (excluding recorded speed limit breaches) and in 2009 the comparative figure changed to 42 over the same time period. The number of reported ferry-related incidents in the first nine months of 2008 and 2009 (excluding speeding recorded from AIS) were therefore roughly an order of magnitude greater than the mean annual figure for the preceding 10 years. A similar trend was noted reports of incidents of all kinds.

Because of the change in the reporting system and its effect on the number of incidents recorded, the analysis in this report is confined to a like-for-like comparison of the records for 2008 and 2009 from the first of January to the 30th of September. In these two years, the new reporting system had bedded down and, as the sailings in 2008 were made by the C-class and in 2009 the vast majority of sailings were carried out by the W-class, a comparison of operations with the two ferry types is possible.

Accordingly, the LHC Incident Report Summaries have been studied, focussing only on those incidents which involved a ferry in one way or another.

Figure 30 shows how the incident numbers vary from January to September in 2008 and 2009.

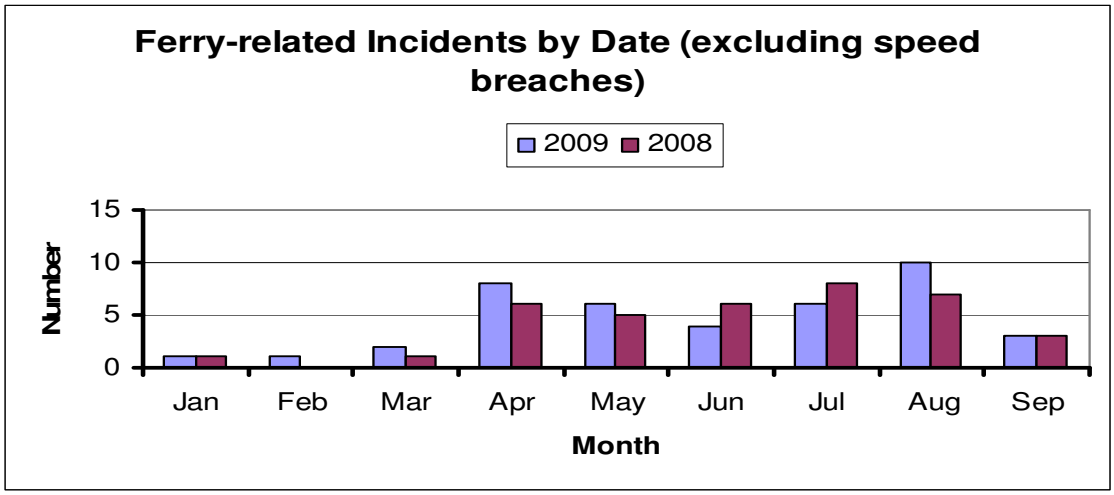


Figure 30: Reported Ferry-related Incident Distribution with Time

It is seen that there are very few reports in the winter months, results for October to December 2008 confirming this in the absence of data for the same period of 2009. A surge in April is followed by a reduction before the peak around July and August. This trend is not surprising considering the activity on the river throughout the sailing season.

Note that breaches of speed limit incidents have been excluded from Figure 30; these can be very numerous due to the AIS surveillance system and tend to dominate the results. Most occurred in Long Reach and in 2008 there were 49 recorded incidents up to the end of September whereas, in 2009, there were 12, 4 of which involved C-class vessels. However, as mentioned in Reference 1, while these were technically breaches of the speed limits, AIS 'events' take no account of the need for a speed greater than the limit plus tolerance on occasions. This was discussed in the reference and it was made clear that the ColRegs and local Byelaws allow for increased speed in situations where it is required for navigational safety, i.e. in strong winds and cross currents for example. A review of the 2009 breach locations has confirmed that all occurred in Long Reach, with most below the No 5 and 6 Navigation marks where strong Solent cross currents are experienced. In 2008 the majority of speed breaches also occurred in Long Reach which, on the face of it, supports the view previously expressed by Wightlink masters that the C-class ferries were less able to deal with strong cross-winds combined with strong crossing tidal streams in Long Reach without increasing speed and/or using large drift angles. The W-class, with their improved control and reserves of power, are better able to cope with these conditions and, accordingly, are better able to adhere to the speed limits. Observations made above in this report have shown that this is confirmed by overground speed records from a number of river passages. In what follows, therefore, ferry-related incident statistics, excluding speed breaches, are discussed.

Information from Wightlink confirmed that from the week beginning 31 December 2008 to 29 September 2009, the W-class ferries made 12400 sailings. In the same period in 2008 there were 17354 C-class sailings, about 40% more. The difference is presumably due to the different schedules for the W-class during the period, comprising two- and three-boat operation.

The incidents for the nine-month period of 2008 and 2009 are compared in Figure 31. It is seen that the categories in which most of the incidents fell are:

- Vessels Impeded;
- Thruster Slipstream Effects;
- Near Miss;
- Grounding.

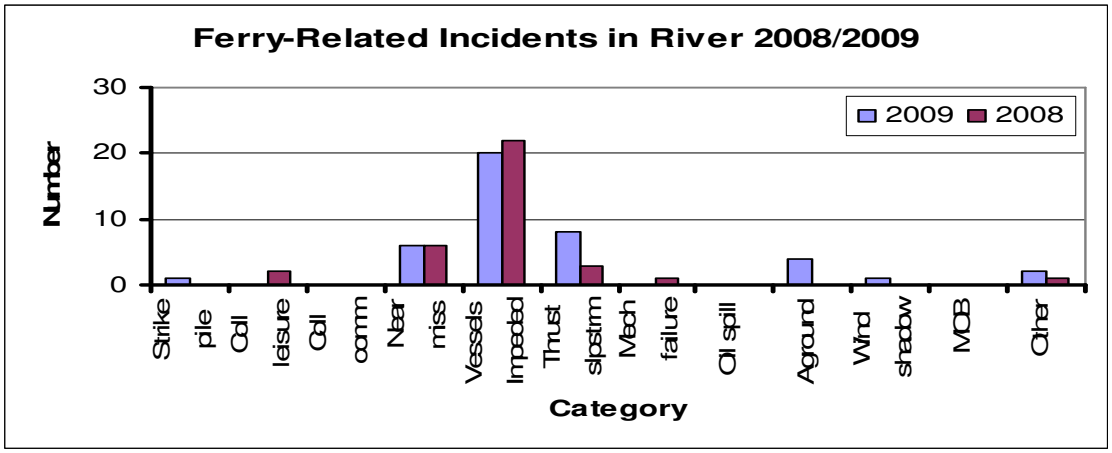


Figure 31: Ferry-Related Incidents (excluding speeding) on the Lymington River: 2008 and 2009 compared.

It should be noted that in 2008, 86% of the vessels impeded were ferries, while in 2009, this figure rose to 95%; the remaining incidents in this category involved ferries impeding leisure users. In the "grounding" category, only one of the four incidents recorded in 2009 involved a ferry running aground. Clearly, in the "thruster slipstream" category, eight of which occurred in 2009 compared to three in 2008, leisure vessels were disadvantaged and most incidents of this kind occurred in the vicinity of the Lymington Terminal during berthing manoeuvres or when the ferry was secured alongside. This was acted upon during the Review and remedial measures were instigated to reduce this effect to ALARP in the short term and until such time as the berth modifications are in place. In this regard, it is of interest to note that the "vessels impeded" results dropped from 6 prior to July 2009 to 2 after the remedial measures were in place.

The distribution of incidents in 2009 is shown in matrix form in Figure 32 and an alternative, pictorial, plot is given in Figure 33. It is seen that most of the incidents occurred between the ferry terminal and the Cocked Hat bend with those in Horn Reach (excluding the ferry terminal area) the most numerous. Of those in Horn Reach, the greatest number of incidents occurred in the "Vessels impeded" category, with a smaller number related to thruster slipstream effects. In Short Reach most incidents concerned the ferries being impeded, the same applying to those in Long Reach. In the region of the ferry terminal, incidents were spread between vessels being impeded (most of which were ferries), close quarters situations and ferry thruster slipstream effects. The very low number of incidents (2.4% of the total) in the Short Reach Lay-by area may be noted; in 2008 with the C-class in operation, some 17% of the incidents occurred there, showing a significant reduction with the W-class in operation. By contrast, the total in Horn Reach in 2008 was some 23% in 2008, rising to 36% in 2009; as already mentioned, this is largely accounted for by an increase in "vessel impeded" (mainly the ferries) incidents there in 2009.

Regarding the ferry-related incident rates compared to the number of sailings, the figure over the measurement period for 2008 (excluding speeding) was 2.0 per 1000 sailings while that for 2009 (up to the end of September) had risen to 3.4 per 1000 sailings. The increase in 2009 is largely accounted for by the increase in thruster slipstream incidents and groundings.

It is also of interest to note that in the measurement period of 2008 there were 83 reported safety-related incidents of all types on the river (excluding speeding), of which 42% involved ferries, while up to 30 September 2009 there were 112 incidents of all types, of which some 37% involved ferries.

Ferry-related safety incidents 2009 by location and category

	Location										
Category	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Wind shadow							1				
Striking Pile					1						
Grounding	1										
Grounding							1				
Grounding							1				
Grounding							1				
Vessel Impeded					1						
Vessel Impeded				1							
Vessel Impeded				1							
Vessel Impeded									1		
Vessel Impeded				1							
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Vessel Impeded				1							
Vessel Impeded				1							
Vessel Impeded				1							
Near Miss Ferry									1		
Near Miss Ferry									1		
Near Miss Ferry							1				
Near Miss Ferry							1				
Near Miss Ferry					1						
Near Miss Ferry				1							
Other					1						
Other									1		
Ferry Slipstream				1							
Ferry Slipstream				1							
Ferry Slipstream									1		
Ferry Slipstream				1							
Ferry Slipstream									1		
Ferry Slipstream										1	
Ferry Slipstream		1									
Ferry Slipstream				1							
Number	1	1	0	15	7	0	9	0	8	1	0
Percentage	2.4	2.4	0.0	35.7	16.7	0.0	21.4	0.0	19.0	2.4	0.0

Figure 32: Ferry-related Incident Matrix for 2009

The location code for this Figure is given in Table 3:

Location	Code
Short Reach Lay-by	1
Short Reach (Harpers Lake)	2
Harbour Master's Pontoon	3
Horn Reach	4
Long Reach	5
Outside River	6
Short Reach	7
Wightlink Freshwater Berth	8
Wightlink Linkspan	9
Wightlink Overnight	10
Wightlink Slipway	11

Table 3 Location Codes

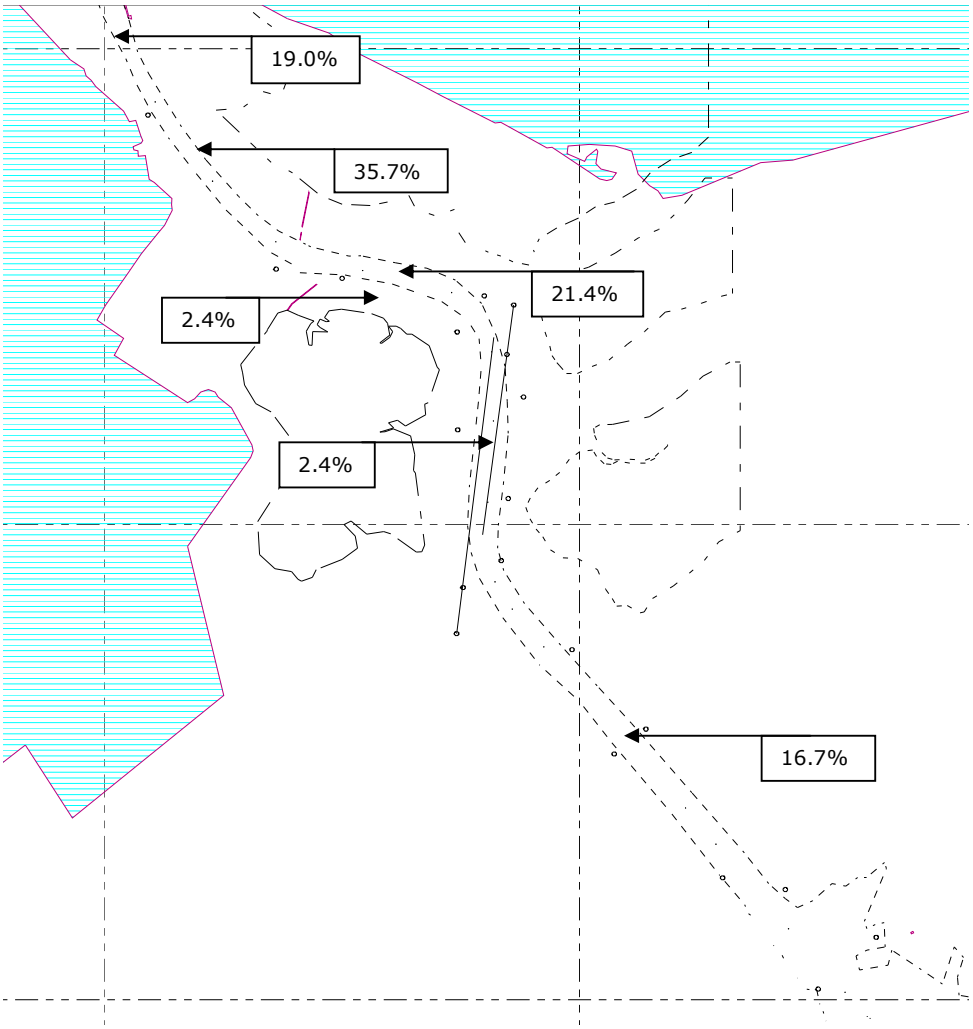

Figure 33: Distribution of Ferry-related Safety Incidents, 2009

6.2 Risk Register Revisited

A review of the Risk Register of Reference 1 was undertaken to identify whether any previous assumptions or assessments needed to be revised as a result of additional information gathered during the Review. It should be remembered that this was a Register in which the change in risk associated with the introduction of the W-class ferries, compared to that with the C-class vessels, was the main output. The summer Review was aimed at addressing the same issue and all that follows relates to the change in residual risk once control measures have been applied and whether those control measures themselves need to be modified.

The method used for this may be summarised as:

- For all the hazards listed in the original risk register, add additional information based on evidence from the observations made during the summer sailing season;
- Up-date the risk control measures if and where appropriate;
- Review the comparative risk assessment;
- Review the overall risk assessment.

The detailed evidence base for the original Phase 2 Risk Register is given in Appendix 10 of Reference 1. The summary Risk Register is repeated here as Table 4 with comments and observations added in blue. The conclusions reached are that the original comparative risk assessment of Reference 1 is confirmed, no additional hazards or residual risks having been identified, and it was also confirmed that the recommendations of Reference 1, once implemented, are able to reduce risk to ALARP.

Good compliance by the ferries with the SOP was observed and this, together with overall compliance with the recommendations from Reference 1, are both treated separately in Section 6.3 below.

Some additional risk control measures have been identified associated with berthing manoeuvres and the use of thrusters when secured alongside; these, and the remaining control measures presently in place, will allow LHC to meet the requirements of the Port Marine Safety Code by applying a risk-based approach to the management of navigational safety in ferry-related operations.

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimated Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	Hazard and potential accident scenario description				Existing/ Planned Risk Control Measures for W-Class ferries	Required Additional Risk Control Measures to achieve ALARP				
1	2 ferries passing at layby	Collision of 2 ferries, resulting in multiple injuries, grounding, blockage of navigation channel, loss of cargo	Lower	Lower	Lower	Ferry damage stability and survivability to conform to IMO/MCA requirements; operation of the ferry to conform to ISM/STCW requirements Adhere to ColRegs, use Transit Marks in good visibility, also use the master's judgement as to whether to pass at all	Use radar/ECDIS in poor visibility	Lower	0		Low due to compliance with latest IMO/MCA damage stability regulations Collision on passing would occur only at layby area.
2	ferry transiting area with sailing vessels present	Loss of control/capsize as sailing vessel passes into ferry wind shadow in river; Loss of control/capsize as Junior sailors pass into wind shadow in Horn Reach	Higher	Same	Higher	Keep clear of ferries as advised in LHC Harbour Guide; Compliance with ColRegs Juniors moved to sides of water space as ferry passes.	Additional Harbour Master presence would reduce probability by stimulating good and compliant behaviour of leisure craft. Anticipate wind shadow Sail only vessels should have another means of propulsion (e.g. a paddle(s) for dinghies) Additional Harbour master patrols have reinforced good and compliant behaviour of leisure craft. Yacht clubs are now reviewing their procedures and briefing members regarding wind shadow.	Higher	3	Junior sailing is moved clear of ferries, and this practice should continue	Low to medium due to greater windage. Low for Junior sailing

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimate of Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	Hazard and potential accident scenario description				Existing/ Planned Risk Control Measures for W-Class ferries	Required Additional Risk Control Measures to achieve ALARP				
3	ferry transiting area with sailing vessels present	Small vessel sailing near waiting ferry loses wind due to wind shadow, could cause small boat to move towards the ferry and collide with it; could cause sailing vessel to capsize	Higher	Same	Higher	Keep clear of ferries as advised in LHC Harbour Guide; anticipate wind shadow Compliance with ColRegs Juniors moved to sides of water space as ferry passes.	Sail only vessels should ideally have another means of propulsion (e.g paddle(s) for dinghies) Ensure, that, wherever possible, sail only vessels have another means of propulsion and sailors should be briefed on the potential for, and implications of, wind shadow.	Higher	1		Low to medium due to higher windage
4	ferry transiting area with sailing vessels present	Too low a river speed results in reduction in control, ferry grounding, contact or collision Longer occupation of the river if speed low so greater chance of bunching and impeding sailing activities	Same	Higher	Higher	Ferry to maintain a safe speed (minimum whilst maintaining control). W-class hull design has low wash at river speeds W-class has better inherent controllability Maintain existing speed limits Good compliance with speed limits by ferries observed; limits breached by some leisure craft	Use recommended thruster settings Improve ferry/river communications; Look-out platforms at bow and stern now installed LNTM 11, 2009 refers with regards to berthing	Similar	0		Low with existing advisory and mandatory speed limits
5	ferry transiting area with any *(commercial or leisure)* vessel underway or moored	Sinking/ swamping of other vessels (including moored vessels) due to wash Wash swamps/ inconveniences other vessels	Lower	Higher	Could be Lower or Higher	Control speed and adhere to limits, low wash hull form, use appropriate thruster settings, be aware of other users on the river. Good compliance with speed limits by ferries observed	New handlers to have close and continuous supervision in winds and when manoeuvring close to leisure traffic or moored vessels Use of correct through-water speed for the conditions, use of thruster speed setting recommended in Safe Operating Profile (SOP) Good compliance with SOP observed and all masters now have provided evidence that they have required experience in strong winds	Lower	0		Low

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimate of Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	**Hazard and potential accident scenario description**				**Existing/ Planned Risk Control Measures for W-Class ferries**	**Required Additional Risk Control Measures to achieve ALARP**				
6	ferry transiting area with any vessel underway	Ferry capsizes rapidly in Solent (seaward of Jack in the Basket mark) after sustaining damage with heavy loss of life	**Lower**	**Lower**	**Lower**	Ferry damage stability and survivability to conform to IMO/MCA requirements; operation of the ferry to conform to ISM/STCW requirements	None	**Lower**	**-3**		Low
7	ferry transiting area with any vessel underway or moored	Boat (moored or moving) hit by ferry Restrictions on bridge field of view results in collision with leisure vessel	**Similar**	**Similar**	**Similar**		Stop single point mooring on inside of Cocked Hat Bend and western side of Short Reach Lay-by area; keep good lookout on ferries; ferries keep to middle of river when possible; keep clear of ferries Maintain lookout, use extent of bridge wings on ferries, check around ferry before departure; use on-board CCTV cameras; check bow blind spot before sailing or moving off Lookout platforms now in place at bow and stern and used in checking the bow is clear.	**Lower**	**0**		Low

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimate of Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	**Hazard and potential accident scenario description**				**Existing/ Planned Risk Control Measures for W-Class ferries**	**Required Additional Risk Control Measures to achieve ALARP**				
8	ferry transiting area with any vessel underway	Collisions between or grounding of small craft because of lack of space during busy periods	**Same**	**Same**	**Similar**	All craft to comply with ColRegs (6.9) Small craft to adhere to Cops to limit boat numbers Small craft to keep out of the main channel if possible	Ferries to keep to centre of channel where possible and pass on Transit Marks. Extra HM patrols at busy times. Adopt greater use of sound signals to inform users Use Transit Marks for passing, adhere to ColRegs and Byelaws, use appropriate speed, use radar/ECDIS in poor visibility, keep good lookout, follow safety advice in LHC Harbour Guide. Follow guidance in MGN 199(M), harbour launch patrols, adhere to CoPs for organised events. Greater use of sound signals to inform users observed Lookout platforms installed	**Similar**	0	Physical signalling from open bridge wings is possible on C Class but not on W Class. However, signalling from focsle at either end is possible on W-class if access to foclse at true stern provided Lookout platforms now installed	Medium
9	ferry enters area where vessels are moored	Interaction pulls moored vessels into main channel and collision ensues	**Same to Higher**	**Same to Higher**	**Higher**	Maintaining effective lookout making full use of bridge wings Limit speed in accordance with the Byelaws and the advisory limit in Horn Reach Good compliance with speed limits by ferries observed	Ensure boats moored near the channel cannot swing into the path of passing ferries and other large vessels; be aware of ferry proximity and avoid moving on deck when ferry passes Vessels should not be moored on Cocked Hat Bend Some moored boats observed near Cocked Hat Bend on 22 August 2009	**Lower**	-1		Low if Cocked Hat bend mooring measures applied, otherwise low to medium The associated hazard probability is highest during low tide and strong winds

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimate of Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	Hazard and potential accident scenario description				Existing/ Planned Risk Control Measures for W-Class ferries	Required Additional Risk Control Measures to achieve ALARP				
10	ferry is underway	Ferry loses power, resulting in grounding and blocking of river	Lower	Higher	Could be lower or higher	Ensure navigation marks correctly positioned; on ferry maintain lookout, ship handles well in river, echo sounder to be working, especially at low water; ferry proceeds with caution at low water; use visual tide height gauges on navigation posts; ensure regular surveys and make bathymetry plots available	None	Could be Lower or Higher	0	Redundant, reliable machinery reduces likelihood of mechanical failure	Low
11	ferry is underway	Severe weather results in loss of control, damage to other vessels and damage to navigation posts	Lower	Higher	Could be Lower or Higher	W-Class has greater reserves of power and control Good ferry control, use radar and ECDIS; conspicuous and "handrail" visual navigation marks which clearly define the channel; masters to cease ferry operations if they consider situation unsafe; use appropriate thruster settings	Use W-class safe operating procedures: - For winds up to a mean value 25knots, gusting 30, thrusters at "operational"/"full" forward and "idle"/"slow" aft - For winds greater than a mean value of 25 knots, gusting 30 to a mean value of 35 knots, gusting 42, thrusters at "operational"/"full"forward and "intermediate"/"half" aft - All wind speeds to be measutred at RLymYC Start Platform - Masters' competence at higher wind speeds to be subject of formal application by operators demonstrating operational experience - for example through evidence of transits and master "sign off" for adverse weather operation. - All masters now provided written evidence of competence in strong winds - Good compliance with SOP observed	Could be Lower or Higher	-1	Use of ECDIS will reduce likelihood of contact and collision in fog Newly-installed look-out platforms could also be usedin fog, at master's discretion	Low
12	ferry is underway	Grounding due to navigation marks being unrepresentative / main channel migration	Same	Same	Similar		Ensure navigation posts correctly located. Control measure still to be implemented	Similar	0		Low
13	ferry is underway	Grounding or collision due to loss of control during change of con location on bridge	Higher	Higher	Higher	N/A - Hazard is specific to W-Class	Use recommended handover procedures; training; recommend synchronising control positions in the long term. Only handle ships from central con Risk is now considered ALARP as a result of design changes to W-Class.	Higher	2		Medium at present reducing to low if synchronised control positions adopted

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimate of Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	Hazard and potential accident scenario description				Existing/ Planned Risk Control Measures for W-Class ferries	Required Additional Risk Control Measures to achieve ALARP				
14	ferry enters area where persons are in the water	Person in water hit by ferry	Same to Lower	Same	Lower	Keep clear of ferries as advised in LHC Harbour Guide; Ferries keep lookout with a minimum of 3 crew on bridge, two of which are lookouts in bridge wings. No swimming/diving in river	Ensure blind spot under bow checked before sailing and moving off Increased Harbour patrols, especially in the lower reaches and at times of peak leisure use Good compliance with both control measures observed	Lower	-4	The safeguards would be less effective after dark, when there is also likely to be reduced probability of persons being in the water Propulsion system is designed for rapid stops (by reversing thrust to avoid impact) Ferries able to stop rapidly under control People in the water are considered to be at greate risk from leisure craft	Low due to good visibility and surveillance cameras, but blind spot must be checked before sailing
15	ferry enters area where persons are in the water	Person in water sucked into thruster. This accident scenario requires that someone is in the water adjacent to the thrusters, and that they are then pulled towards the thrusters, and that they are then impacted by them.	Lower	Same	Lower	Thusters can be de-clutched on the W-Class ferries. Compliance with LNTM 10, 2008 further reduces the consequences of this accident (i.e. wear life-jackets)	Grab lines should be attached to the hull in the region of the bow, as is the case on the Voith-propelled Red Funnel vehicle ferries. Consideration was given to this proposal by the operators, and it was concluded that the potential perceived risk benefits would be outweighed by the safety risks associated with inappropriate use	Lower	-1		Low

Ref no.	Hazard		Probability	Consequence	Relative Risk	Risk Control Measures		Risk After (Further) Control Applied (relative to C-Class).	Estimate of Change in Residual Risk with W-Class as opposed to C-Class (-5 to +5)	Notes on risks based on BMT's Master mariners' judgement	Indication of level of residual risk based on BMT's Master mariners' judgement (H, M, L)
	Operational scenario	Hazard and potential accident scenario description				Existing/ Planned Risk Control Measures for W-Class ferries	Required Additional Risk Control Measures to achieve ALARP				
16	Ferry arrival / departure	Thrusters' slipstream impacts nearby leisure vessels	Lower	Higher	Could be lower or higher		Stop thrusters when berthed Amended practice for thruster operation when carrying out berthing manoeuvres and when secured alongside. See Table 6 for details. Risk now considered ALARP with present jetty.	Lower	-2		
17	ferry transiting area with any vessel underway	Swamping of leisure craft impacted by aft thruster slipstream disturbance and sudden vectoring	Higher	Higher	Higher	ColRegs Keep clear of ferries as advised in LHC Harbour Guide	Use of appropriate power setting on aft thruster Good adherence to SOP observed and occasions of sudden vectoring reduced	Lower	1		Low if additional risk control measures applied, otherwise significantly higher
18	ferry waiting at layby	Inconvenience to other craft; grounding of leisure craft	Higher	Higher	Higher	ColRegs Keep clear of ferries as advised in LHC Harbour Guide	No waiting in the river Control measure accepted and agreed; good compliance observed	Same	-2	No waiting in the river	Risk would be low if no waiting, otherwise medium in light winds and high in strong winds

Table 4: Summary Risk Register and Comments

6.3 Compliance with Recommendations and SOP

One of the main reasons for this Review was to assess to what extent the recommendations, made in Reference 1 for river safety with the W-class ferries in service, had been adopted. In addition it was also important to determine to what extent the ferries complied with the SOP and whether any changes to the profile were needed, or had been agreed.

Accordingly, this Section reviews both these aspects and takes account of agreements reached between LHC and Wightlink during the course of the BMT Review and a subsequent LHC Local Notice to Mariners (LNTM). It also provides a view on the effect of the SOP on safety in the river.

6.3.1 Compliance with Recommendations

In this Section, observed compliance with the recommendations made in Reference 1 is discussed; Table 5 shows the results. Compliance has been allocated a number between 0 (no compliance) and 4 (complete compliance); notes in the Table give further information and the paragraph numbering of Chapter 7 of Reference 1 is used for convenience.

Paragraph	Summary	Compliance	Notes
7.2.1	Handling: on board	3	Ganging not implemented - may not be needed; con hand-over problems resolved; SOP - see Section 6.3.2 below.
7.2.2	Handling: on river	4	Positioning in river generally good in traffic; should keep on transit marks when W/W passing and traffic density high.
7.2.3	Thruster usage	3	Thrusters used on berth in an easterly wind initially but meeting between LHC/WL on 1st July resulted in revised procedures to mitigate effects, LNTM 11, 2009 refers to thruster effects while berthing. Some masters still to witness thruster effects at river level
7.2.4	Passing and waiting	4	Keep on transit marks in traffic.

7.2.5	Adherence to ColRegs	4	Good but some minor lapses by leisure users seen
7.2.6	Speed discipline	4	Good compliance by ferries; some leisure users do not comply.
7.2.7	Operations in Horn Reach	3	Final berth approach manoeuvres result in thrust that can cross the navigation channel, especially in easterly winds. Manoeuvres take longer than C Class because berth not 'bespoke'. LNTM 11, 2009 refers. Thruster wash effects have greater impact in this congested area than elsewhere in river. WJS procedures – generally working well. Several occasions where ferry masters misjudged room available for departure.
7.2.8	Communication of intent	4	Sound signals used (including pre departure – LNTM No. 11 refers) and look-out platforms now installed at bow and stern. Still difficult to communicate visually from bridge to river users.
7.2.9	Wind shadow	4	Did not cause major problems if users were aware of its effects; dinghy event briefings should highlight wind shadow effects. LHC should improve awareness through safety publications, website etc.
7.2.10	Sharing the river	4	Generally good compliance, but better awareness by users would be beneficial.

7.2.11	Aids to navigation	0	Navigation posts still to be re-positioned. Aware that review completed and application for consents underway. Expect completion by March 2010
7.2.12	Moored boats	4	Some boats still intrude into channel occasionally and awareness of hydrodynamic interaction could be improved.
7.2.13	Grab lines	0	Operator rejected this as it may encourage persons to get too close to ferries
7.2.14	Review	4	This review provides compliance

Table 5 Compliance with Recommendations

It is seen that compliance is generally good and only two examples of non-compliance are given. Those marked with "3", however, are close to compliance, whereas those marked "0" which do not comply are either waiting for works to be done (navigation post relocation) or will not be implemented (grab lines). Those which nearly comply, but rely on LNTM 11, 2009 and the LHC/Wightlink agreement of July 2009, are accepted on the understanding that improvements to the berth at Lymington will be undertaken in due course and the ships will be properly secured in all weather conditions.

Incidents in which ferries, vessels constrained by their draught, were impeded were fairly numerous, especially in Horn Reach. It is assumed that discipline of all users in Horn Reach will improve; it is suggested that additional Harbour patrols in this area would assist.

6.3.2 Compliance with Safe Operating Profile

Compliance with the Safe Operating Profile has been mentioned in Section 5.1.9 above. The SOP in its initial form was introduced at a time when only a limited number of Wightlink masters had been exposed to strong winds in the W-class, and helmsmen had sufficient experience in handling these ferries in a range of conditions. Once the sailing season was properly underway, most of the bridge teams had obtained strong wind experience and, at the meeting between LHC and Wighlink in early July, the SOP was reviewed. As has already been mentioned, this led to a number of agreements, some of which have already been mentioned with regard to hand-over of the con and berthing arrangements at the Lymington terminal.

Table 6 summarises what was observed with regards to the SOP. It should be noted that implicit in the SOP is the requirement that wind speeds are those measured at the RLymYC Starting Platform.

As the documented experience of the masters further increased during periods of strong winds early in the summer season, and on the basis of practical feedback from the masters, it was agreed that the upper mean wind speed limit on the full/half thruster setting be increased from 30 to 35 knots, the gust limit to remain unchanged at 42 knots. This was acceptable to BMT as it represented a safe upper limit which allows control to be maintained on the river. If no upper limit were set, then, should a ferry leave in what turns out to be unsafe wind conditions, excessive thrust could be used for control with consequences for both the river itself and any leisure user on the river at the time. However, in relation to this issue, it is felt important that masters' feedback should continue so that it can be kept under review.

In passing, whereas the use of the "half"/"half" setting when berthing, especially in easterly winds, is understood and accepted, the region of Horn Reach in which the half/half combination is to be used should be clarified by LHC in consultation with Wightlink.

Item	Profile Item Summary	Compliance
1	Use full/idle thruster settings to mean wind speed (MWS) of 25 knots, gusting 30, and then full/half to MWS 30 (now 35) knots, gusting 42. (see text below)	Compliance good; only slight breaches observed in marginal conditions when full/half setting preferred.
2	No waiting in the river	Compliance good; waiting outside river, unless timing misjudged when low speeds in river used.
3	No thruster action when secured alongside berth.	Some non-compliance prior to early July in easterly winds; after early July, new procedures were agreed, including doubling stern lines to avoid use of thrust. In exceptional circumstances, if thrust is required, it must be kept to a minimum and a lookout posted to switch off thrust if other craft approach. Much improved compliance after this procedure was implemented. Full compliance with no thrust is likely only when jetty modifications are complete
4	Passing in river only to occur once all W-class passing trials complete	Compliance good; no incidents associated with passing reported. No handling problems when

		passing.
5	Use of full thruster setting on aft thruster only ever to be used in the river when failure to do so would endanger the ferry or other users.	Compliance good.

Table 6 Compliance with Safe Operating Profile

A number of W-class passing manoeuvres were witnessed during the summer, usually when a three-boat service was in operation; some were at low water springs with one at very low water. These posed no handling problems for the ferries themselves and speeds were adjusted to levels which were safe and prudent in the conditions. However, as mentioned above, on several occasions the ship tracks were outside the leading marks, contrary to a recommendation made in Reference 1. Such events took place when there was no danger to traffic, or when there was no traffic on the river. While having no problem with this, it is still a recommendation that ferries should endeavour to stay on the leads if the passing area is congested, especially with small craft under sail.

6.3.3 Overview

In terms of compliance, it was clear most of the recommendations in Reference 1 were being complied with, and that the SOP was in general operating satisfactorily. The main area where compliance was not met occurred when using thrusters on the berth at Lymington, although matters have clearly improved here since new berthing procedures were agreed and implemented.

The effect of the SOP seems to be entirely beneficial. Leisure users are spared excessive disturbance in the river from the thruster slipstreams and the ferry crews are able to maintain a satisfactory level of control.

7 Discussion

The focus of this review was to assess the effect of marine traffic and strong east winds on the conclusions reached, and the recommendations made, in the Phase 2 study of Reference 1. It was also needed as part of the on-going review process required by the Port Marine Safety Code.

In the event, the review also revealed some additional issues which were addressed once they had been identified. Experience of the W-class masters had shown that an additional thruster setting ("half/half") was beneficial in berthing and low speed manoeuvres, especially in an easterly wind above "light airs" strength. The need to maintain thrust while secured alongside at Lymington in an easterly wind was also revealed and control measures to minimise effects on passing leisure craft were developed by LHC in conjunction with Wightlink. Some of these issues relate to the fact that the present Lymington jetty is not best-suited to the W-class ferries and the shore works necessary to make the required changes have not commenced. It is assumed that, once these have been implemented, berthing and securing alongside at Lymington will be such that thruster action can be dispensed with while secured alongside, an agreed and promised outcome of the introduction of the W-class ferries. Furthermore, these berthing arrangements will allow ferries to be made secure more rapidly on arrival thereby reducing the amount of time 'holding' thrust is deployed.

Further changes were made during the review period to the Safe Operating Profile. These followed the recommendation in Reference 1 that masters should demonstrate sufficient strong wind experience. This was done and accordingly the upper mean wind speed limit was increased from 30 to 35 knots. Further reviews can determine whether, in the light of further experience, these limits can, or indeed need to, change and recommendations can be made accordingly. It is believed that an upper limit which has been demonstrated to allow good control and safe operations in the river needs to be set and maintained to avoid the possibility of a ship losing control in the river with consequent risk to other river users, ferry passengers, the ferry and the river itself.

The increase in traffic density seemed to have little effect on safe operations in the river. Boats moved along the river in "packets" of high density when going to a start in the Solent or having just started in the river; the ferries generally seemed to move in the periods of calm between the packets. Returning to the river (or the finish line in Horn Reach) meant that the leisure traffic was less bunched but was still able to occupy the river at the same time as the ferries. In part this was due to the fact that nearly every date chosen for BMT observation saw high water, neaps or modest low water when leisure traffic was at its densest. This no doubt is a result of adept timing of races with the tides, but it is clear that, as shown in Section 5.1.5, there are few occasions during the sailing season when the combined probability of high traffic density, very low water and the resulting reduced water space occur. In this regard it is notable that in one area where water space might have been considered to be limited – the Short Reach Lay-by area – a very small percentage of ferry-related incidents occurred.

However, in the other area where space is limited at times of high leisure traffic density – Horn Reach – there was the highest number of reported ferry-related incidents. The majority of these were cases of the ferries impeded by leisure users which suggests that awareness of the ferries, and acceptance of the fact that they are constrained by their

draught, needs to improve. However, a small but not insignificant number of near miss incidents involved a ferry impeding leisure users, generally when the master misjudged the amount of space available for departure and pulled off the berth in close proximity to passing craft. Improved bridge look-out procedures on departure to increase awareness of other users nearby should improve matters.

Compliance with overground speed limits by the ferries was good during the observation period as evidenced by both the analysed ECDIS data and the AIS monitoring carried out on a continuous basis by LHC. Although most leisure users also complied with the limits, it was notable that there was some non-compliance, restricted to high-speed planing craft such as RIBs and Zap-Cats. Some of these came close to the ferries on occasion, thereby increasing the potential for an incident.

Wind shadow proved not to have serious consequences during the observation period. Whereas there is certainly an effect, which can last longer than the same effect with the C-class, the majority of leisure users dealt with it well. The only reported incident came from a user who was not familiar with the effect and was accordingly caught unawares. It is suggested that some of the evidence for the drop in wind speed, change in wind direction and likely duration of wind shadow from W-class vessels be brought to the attention of all leisure users of sailing vessels, especially those who are not local to the river: participants in regattas, for example.

Adherence to the ColRegs by both the ferries and leisure users was generally good; some breaches were witnessed, but these were usually resolved as the ferry approached, when users moved to the correct side of the navigation channel. Adherence to the correct "lanes" in the navigation channel, especially by the ferries, is important when the river is busy and less so when it is not. Therefore, although the ferries may have "cut corners" on occasion at Tar Barrel and Cocked Hat, such events usually occurred when the leisure traffic was light or non-existent, or when the water level was high and there was adequate room outside the navigation posts for leisure vessels. Nevertheless, the recommendation made in Reference 1 that ferries should stay as close to the river centreline as possible (consistent with the ColRegs) in times of traffic still applies.

In summary, it was the opinion of the BMT team that the W-class ferries and the leisure users were co-existing well and, although there were some areas which could be improved, the conclusions and recommendations of Reference 1, apart from those which have now been overtaken by events (the reduction of the con hand-over risk to ALARP, for example), still stand.

The historically low levels of marine risk on the river have not, in the opinion of the BMT team, been eroded by the introduction of the W-class ferries as evidenced by both observation and a comparison of the 2008 and 2009 incident statistics. With regard to compliance with the Port Marine Safety Code, it is the opinion that the LHC comply and that the risks in the register are ALARP or will be ALARP when certain changes (such as the review of the navigation marks) are completed.

8 Conclusions

As a result of reviewing operations on the Lymington River during the sailing season of 2009, the following conclusions were drawn:

- Ferries and leisure users are finding a way of operating together satisfactorily; communication of intent on the river is improving;
- Wednesday Junior Sailing is able to operate as usual and in safety when W-class ferries are operating;
- Increased leisure traffic density has very little effect on river safety and the conclusions and recommendations made in Reference 1 as a result of the Phase 2 study are unchanged;
- The Phase 2 Risk Register remains unchanged, although two risks (con hand-over and thruster use at the terminal) are now considered ALARP;
- The increase in Harbour Master patrols on busy days has been successful and was appreciated by users. More time spent in Horn Reach would be beneficial;
- Wind shadow, while clearly experienced by sailing craft passing the ferries, did not generally give rise to significant incidents and reported incidents were very low. Awareness of wind shadow and its effect could be improved, however;
- Operation of a three-boat, 40 minute, service was not successful on the days when BMT observations were made, due in part to shore-based operational reasons, outside the control of the ferry crews;
- A two-boat hourly schedule did appear to work satisfactorily, presumably because there was enough "buffer" time in the schedule to make up for lost time;
- Compliance by the ferries with the statutory and advisory speed limits was satisfactory; speed breaches were fewer in 2009 than in 2008;
- Compliance with the up-dated Safe Operating Profile was satisfactory;
- Compliance with the ColRegs was satisfactory;
- Most of the recommendations made in Reference 1 have been adopted;
- Most reported ferry-related incidents occurred in Horn Reach, of which the majority related to the ferry being impeded, followed by thruster slipstream effects;
- Problems of securing the stern occur at the Lymington terminal in an easterly wind which led to the use of thrusters to hold the stern alongside on occasions. Following a meeting between LHC and Wightlink on the 1st July, agreement was reached on minimising the need for thrust by doubling the stern lines. Agreement was also reached that in the exceptional event that additional stern lines are insufficient, minimal thrust can be used in combination with extra stern lines. However, in these circumstances a lookout must be posted to monitor thrust levels as well as nearby traffic in order to turn off the thruster for passing traffic;
- Experience gained by the ferry masters has demonstrated the advantage of a "half/half" thruster setting when manoeuvring at low speed near the terminal during berthing or when moving between the night berths and the linkspan.

9 Recommendations

As a result of reviewing operations on the Lymington River during the sailing season of 2009, the following recommendations are made:

1. Continue to use the Safe Operating Profile;
2. Continue to build a database of masters' experience in strong winds;
3. Increase awareness in the Clubs of wind shadow and its effect, especially for leisure users not familiar with the river and the ferry operations. The LHC is recommended to consider achieving this by means of Safety Leaflets, the LHC web site, the Harbour Booklet etc;
4. Continue to use the recommendations of LNTM 11, 2009 and the LHC/WL agreement of 1 July 2009 until the berth modifications have been carried out;
5. Tolerances allowed on the speed limits should remain until the next review;
6. LHC should continue to offer masters a chance to witness thruster slipstream effects from river level;
7. Leisure users should increase their awareness of ferry proximity to avoid actions which impede the ferry;
8. When leaving the Lymington Terminal, masters should ensure that no leisure craft nearby are likely to be impeded or compromised by the ferry departure;
9. The region in Horn Reach where the "half"/"half" setting is acceptable should be agreed between LHC and Wightlink.
10. Maintain an ongoing navigational safety review and management process, consistent with the requirements of the Port Marine Safety Code.

10 References

1. "Ferry Operations at Lymington: the W-class Ferries" BMT Report on Phase 2 of Project C13537.01, April 2009

2. "Ferry Operations at Lymington, Phase 1: The Present Situation and Future Predictions" BMT Report on Phase 1 of Project C13537, March 2008.

APPENDIX 1

BMT Visit Reports for Observation Periods

Ferry Operations in Strong Easterly Wind 11 May 2009

NOTES ON SOME W-CLASS PASSAGES IN A NORTH EASTERLY WIND

1. Introduction

An opportunity arose on 11 May 2009 to witness Lymington – Yarmouth –Lymington passages on the Wight Sky and Wight Light in a moderate north easterly wind. These notes summarise observations made on Wight Sky.

2. Notes and Observations

In the afternoon of 11 May 2009 a moderate north easterly wind was blowing in the West Solent in combination with a spring tide which, while not extreme, was likely to provide a reasonably strong ebb flow across Long Reach. As such conditions had been identified in the BMT Phase 2 report as worthy of observation with regard to W-class handling, it seemed a good opportunity to witness operations.

Accordingly after the first, outbound, trip, Captain John Noble travelled on the bridge of the Wight Light while Dr Ian Dand travelled on the bridge of the Wight Sky with Colin Freeman of the LHC on the water. The period of observation on Wight Sky commenced on the 1500 (BST) sailing and ended with the arrival of the Wight Light at Lymington at about 1845. Low water was recorded by the Channel Coastal Observatory site (on the RLymYC Start Platform) as 0.79 metres ACD at 1840 BST.

The following observations were made:

- The bridge team seemed to like the vessels and felt they had bedded down satisfactorily both for handling in wind and loading/unloading, although the Bank holiday weekends had proved challenging. The view was expressed that the two-boat hourly service (in operation in the early part of the exercise) was comfortable for the boats and crews, but moving to a two-boat 45 minute service meant that adhering to the timetable became problematic. It was observed that on the change-over run on Wight Sky, the outbound trip left 15 minutes late (i.e. as if still on an hourly, not 45 minute, service) due to a large number of foot passengers slowing up loading as they sterilise the loading ramp for vehicles as they embark. It did not prove possible to make up the deficit in subsequent transits. Delays occurred at Yarmouth from the same cause because it was not possible to use the side door as it did not fit the berth there;
- In spite of the general feeling of satisfaction expressed with the W-class, the helmsman on the first out-bound run (1500 BST sailing) gave the view that Wight Sky was somehow inferior to Wight Light in handling and it was clear that on the Long Reach transit, in a quite strong ebb cross flow, he was not happy with the vessel. He admitted to a poor turn at Tar Barrel when he "let the stern hang out" and the remaining run down the Reach was carried out at what seemed like a sizable drift angle in the combined ebb flow and north easterly 22 knot (mean) wind. "Full"/"half" was in use on the thrusters. Although traffic in the river on the day was either zero or very light, on this first outbound run, an inbound keel-boat, which was motor-sailing in, was passed in Long Reach without apparent problems, in spite of the ferry's drift angle;
- The helmsman also independently expressed his view that he would have preferred the thruster controls to have been "ganged", as suggested in the BMT P2 report;

- The magnitude of the ebb was illustrated at Yarmouth where, as seen in Figure 1, a drift angle in excess of 30o was needed to ease toward the link span while maintaining a course-made-good parallel to the "long pier";
- While the river and Solent passage had been conned from the centre of the bridge, berthing at Yarmouth was carried out from the port bridge wing. On the first trip this caused no problems and hand-over from the centre con to the wing was achieved satisfactorily;
- This was not the case on the next arrival at Yarmouth when the hand-over failed at about 1720 BST. This occurred at a location just before that depicted in Figure 1 for the previous arrival and it took some time before the Master recovered the situation at the centre con.

Figure 1: Arrival at Yarmouth at about 1530 BST on 11 May 2009

- Once on the berth, the aft thruster was kept running to hold the stern (i.e. the "Lymington End") on the berthing face in the easterly wind. This created a noticeable wash while the vessel was berthed, but a large yacht, motoring in, was able to pass through it and into the harbour satisfactorily;
- The return run was undertaken with the bosun at the wheel in the river with the thrusters on "Full"/"half" and the wind now about 22 knots mean, gusting 25. The bosun's preference was for the thrusters to be on "half"/"half" on the last part of the approach to the Lymington linkspan and the change to this setting was made level with the Harbour Master's pontoon. Berthing was carried out from the centre con position so no hand-over was involved;
- Figures 2 to 5 show the thruster output at various points along Horn Reach on this run. In spite of the easterly wind (whose velocity was much lower in the sheltered upper reaches of the river) the offset of the thruster jet to one side was quite small, although, as Figure 4 shows, the slipstream in the final stages of berthing was directed well to one side;

- Once berthed, the master did not at first leave any thrust on the aft thruster, saying he would "see how she behaves". Eventually he set the thruster to about 10% with very little wash, as Figure 5 shows;
- This, and a similar use of the thrusters while berthed at Yarmouth mentioned above, appears to contravene the early, and often repeated, assurance that the W-class thrusters would be stopped while the vessel was berthed. Indeed, if use of the thrusters is necessary to hold the ship in a strong easterly wind at both Yarmouth and Lymington, it suggests that mooring arrangements at both terminals are not satisfactory for winds which set the ship off the berthing face;
- The next run was the first of the 45 minute schedule and, as mentioned above, left about 15 minutes late. The wind by now was about 26 knots gusting 30 at the Start Platform and "Full"/"Slow" was set on the thrusters. When in Long Reach the helmsman could not hold the ship satisfactorily and changed to "Full"/"Half" near Tar Barrel.

Figure 2: Arrival at Lymington at about 1638 BST on 11 May 2009

Figure 3: Arrival at Lymington at about 1639 BST on 11 May 2009

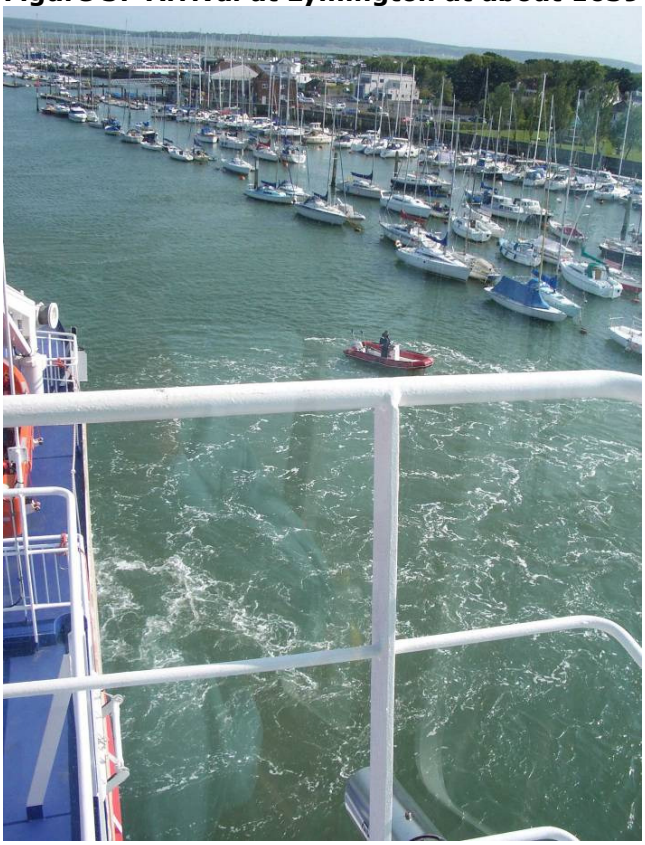

Figure 4: Berthing at Lymington at about 1643 BST on 11 May 2009

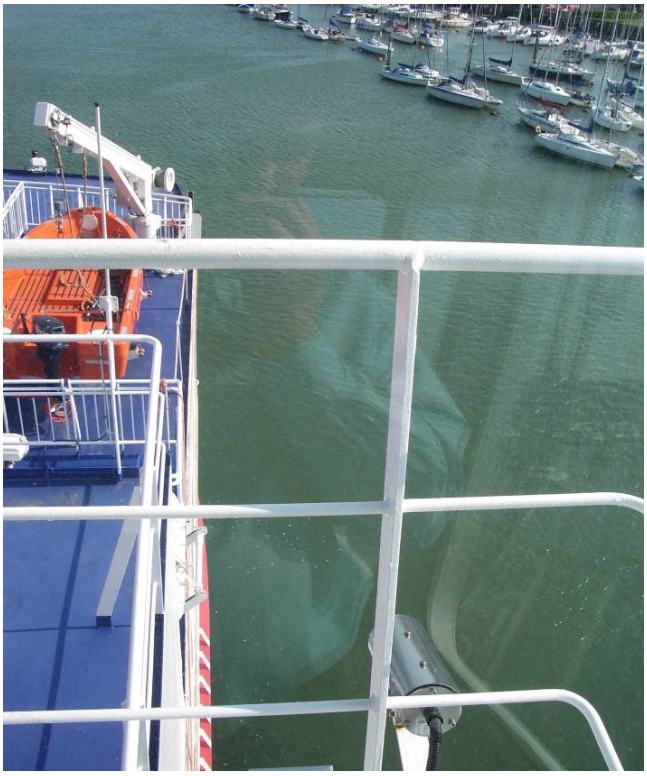

Figure 5: On Berth at Lymington. Aft thruster on 10%. About 1648 BST on 11 May 2009

- The last run witnessed passed through the Short Reach Lay-by area at about 1815 BST when the tide height was about 0.81 metres with the wind still north easterly at about 24 knots gusting 30. There was no other traffic in the river at the time so an uneventful passage was made, albeit at a speed of about 4.4 knots over the ground from just before Tar Barrel to the berth. The initial passage along Long Reach was made with the thrusters on "Full"/"half" but this was changed to "full"/"slow" just before Tar Barrel. A further change to "half"/"half" was made off the Harbour Master's pontoon as in the previous Yarmouth/Lymington run'
- At no time during passage on the Wight Sky was any reference to Wightlink control heard for information on the measured wind speeds at the Start Platform. For the whole of the afternoon the wind appeared to be on the borderline between the "full"/"slow" and the "full"/"half" thruster settings, but for much of the time in the river the "full"/"half" setting was preferred.

Ian W Dand
13 May 2009

Optimist Open Meeting, 13 June 2009

Memo to: Julian Lockett, BMT Isis
Cc: Ian Dand, Ryan Willigers
Date: 14th June 2009
Re: Observations on Lymington River, 13th June 2009

Attendance Record:

Arrived harbour office	0945
Boarded harbour Master Cutter	1000
Left HM Cutter	1230
Boarded Wight Sky	1255 Captain Barry Vaughn
	1500 Captain Roy Nichols
Left Wight Sky	1725
Boarded Wight Light	1815 Captain Wendy Maughan
Left Wight Light	1920

Observations

I have only recorded remarkable events in this memo. The purpose of the attendance was to see the operation of W Class ferries on a day when the Optimists were holding a big event and X Boats were sailing. Other river traffic was unremarkable.

1) The Optimist launch of some 120 dinghies was very well organised and controlled. They kept out of the channel at all times and were not a problem for the ferries. River traffic was light with a WSW wind about force 3.
2) Wight Sky (Barry Vaughn) BV is concerned about the docking manoeuvre at Lymington and the need to use more thrust. He agreed that having had more experience he was able to operate with less thruster movements and within the requirements. He said that any increase in the wind parameters would be welcome as he was confident of safe manoeuvring in pretty well any wind. Certainly 35, gusting 42 would present no difficulty, his view was "leave it to the Master to decide". One yacht was seen wind shadow affected, without difficulty. I was shown a photograph of a grossly overmanned rib in the river.
3) Wight Sky (Roy Nichols). RN also felt that the decision when to operate in strong winds should now be left to the Master. Most of the time on the river was without incident. Wind shadow effect was noticed with several yachts, but without any difficulties being noticed. However, on the "busy" run in between 1615 (Starting Box) and 1625 (Wave Screen) the ferry coped with the influx of X Boats. Emergency action was required at the wave screen when two X Boats crossed very close ahead of the Wight Sky, necessitating an emergency stern thrust movements accompanied by sound signals. The sail numbers were noted X170 and X178. The ferry coped well. While Wight Sky was berthing a small yawl, under sail only, tried to pass the ferry berth and was affected by the thrusters.

Figure 1: X Boat crossing dangerously ahead at wave screen

Figure 2: Yawl under sail only (light airs) experiencing difficulties when trying to pass Wight Sky during berthing

While the Wight Sky was berthed in Yarmouth, at about 1540 two swimmers were seen in the water near the ferry. Having been spotted they were closely monitored by the ship's staff.

4) Wight Light (Wendy Maughan) This trip was uneventful, by this passage leaving Yarmouth at 1835; the traffic was very quiet when running up the Lymington river. Captain Maughan agreed with the other two masters regarding who should have the decision when to operate the ferries in wind and she, having experienced some very bad weather, felt any decision should be for the Master alone.
5) Common Points. All three masters expressed concern at the new clutching arrangements, where everything had to be zeroed before clutching in a second engine. This might lead to delay in emergency reaction.
   Radar (For Ian) I checked the radar images and found they were able to pick up small targets (ribs and Optimists) satisfactorily.
   Wind Effect was observed on about 7 or 8 occasions and at no time were there any difficulties.

All the masters agreed that Thursday evenings were the regular congested times due to race starts and Thursday 9th July is suggested for an attendance.

John Noble 14th June 2009

Wednesday Junior Sailing and Evening Racing, 24 June 2009

TRAFFIC ACTIVITY ON THE LYMINGTON RIVER: SOME OBSERVATIONS ON 24 JUNE 2009

1. Introduction

These notes relate to observations made on the Lymington River on 24 June 2009 during the period when the following activities were taking place:

- Wednesday Junior Sailing
- XOD racing in the Solent, requiring the fleet to sail downriver to the start and return again after racing
- Various dinghy classes racing from the LTSC start line on the river and finishing in the river.
- "Two-boat" operation of the Wightlink ferries Wight Sun and Wight Sky on an hourly schedule.

Observations took place over three periods, the first being on the bridge of the Wight Sky from 1345 BST to 1535 BST, the next on the river from about 1600 BST to 1650 BST to witness the return of the XOD class and the third from about 1800 BST to 1945 BST to witness the dinghy racing from start to finish.

Tidal levels during the observation period were measured by the Channel Coastal Observatory (CCO) at the RLymYC Starting Platform as shown in Table 1:

Time (BST)	State	Level (m)
13:50	High water	2.97
18:20	Low water	0.71

Table 1 Applicable Tidal Conditions

The Wight Sky bridge party were taking predicted low water as 17:48. It was not clear if this was BST or GMT, but it was assumed to be in the Solent, rather than in the river.

Wind on the day was easterly as shown by the CCO measurements given in Table 2:

Time (BST)	Mean Speed (kts)	Gust Speed (kts)	Direction (°)
1348	12.8	16.0	90
1528	12.4	13.6	80
1608	12.8	16.4	80
1708	10.6	12.8	90
1808	14.2	16.0	90
1948	19.0	23.6	80

Table 2 Applicable Wind Conditions

2. Observations

2.1 On the Wight Sky

I joined the Wight Sky as the crew changed and Captain Martin Adams took over from Captain Roy Nicholls.

On leaving the Lymington Linkspan the XODs were out of the river, gathering near the RLymYC Starting Platform prior to the race. There was little other traffic on the river and this remained the case for the outward passage. The Wednesday Junior Sailing followed its well-tried and well-executed system whereby ferries and children are kept apart and no problems were encountered. Other sailing traffic was well-behaved and adhered to the ColRegs by keeping well to starboard in the navigation channel.

The ferry thrusters were set to "full" forward, "slow" aft for the river transits and, although the master indicated that, for some unknown reason, four engines were clutched in on departure, he de-clutched two of them shortly after leaving. Ensign discipline was good on Wight Sky, but poor on Wight Sun which was observed passing outbound from Lymington later in the day with the ensign on the fore (i.e. Yarmouth end) mast. Sound signals were used on Wight Sky as necessary.

The bridge was quite full because of the presence of a number of trainees. It transpired that this was due to the need for more trained crew as the Wightlink Board have taken the decision to operate a three-boat service over much of the summer season, rather than just over peak weekends and other busy times, as they have implied in the past.

On the outbound run, the con was taken by a trainee helmsman who, with another trainee for the Solent crossing, operated the ship from the centre position until arrival at Yarmouth where the berthing was carried out by the original trainee from the port bridge wing. Hand-over from one conning position to the other took place without a hitch.

Overground speed in the river was good and the speed limits were adhered to. As seems to be quite common, the bend at Tar Barrel was taken on the port side of the channel, there being no inbound traffic in the vicinity of the bend, and the ferry stayed more or less in the middle of the channel down the rest of Long Reach. Wight Sun was passed in the Solent.

In order to adhere to the timetable, the Wight Sun was timed to leave Lymington 10 minutes before the Wight Sky left Yarmouth, giving a stay in Yarmouth of around 40 minutes, a timing confirmed by my observation; this may be compared with the timetabled stay in Lymington of about 20 minutes. The result of these timings is a passing location in the Solent, clear of the river. When the three-boat service is in operation, the passing location will revert to the Short Reach lay-by area.

The return passage up the river was uneventful, apart from a fishing boat which slowly overtook the ferry to starboard in Long Reach, keeping just outside the channel where there was enough water in the high water stand. On approaching the turn at Tar Barrel, however, the fishing boat, by now near the starboard bow of the ferry, passed between

the ferry and the post and returned to the channel just ahead of the ferry as Figure 1 shows.

The remainder of the river passage was uneventful, the sound signal being audible at the wave screen, and traffic in Horn Reach was light as shown in Figure 2.

Final berthing was carried out from the starboard bridge wing after a trouble-free hand-over, and it was clear that fairly firm aft thruster action was needed to bring the stern in against the easterly wind. Once the mooring lines were ashore, the master stayed on the bridge to operate the aft thruster as necessary to keep the stern under control while the ship was in the Linkspan (see Figure 3).

Figure 1: Fishing Vessel passing ahead of Ferry

Figure 2: Traffic in Horn Reach

Figure 3: Use of Stern Thruster while Alongside

It must be mentioned in passing that use of thrusters while the ferries are berthed contravenes the Safe Operating Code of Practice which states that thrusters must be

stopped when berthed. It is understood that with an easterly wind the masters are concerned that the aft mooring line (which appears to be, in effect, a breast line) is not able to hold the stern in position so thrust is needed to keep the ship alongside and prevent the bow ramp slewing while loading and unloading. This concern may be due to fears that:

- The aft breast line is not strong enough for the job;
- Its mooring bollard and mounting are not strong enough.

If the former is the case, then either an additional breast line could be run (a not uncommon feature of the mooring schemes of many ship types), doubling up with the existing line, or, subject to capstan/bitt capacity, a stronger line could be used. It is known that wear rates on ferry mooring lines are high so that doubling up might be a better solution as the load in each line will be reduced.

If the latter is the case and the bollard is weak, then steps should be taken to strengthen its mounting for reasons of safety to both shore and on-board staff.

2.2 On the River

The first spell on the river saw the XOD fleet returning to their moorings at a time when other river traffic was light and the high water stand was still evident. Consequently the XODs had enough room for sailing both in the navigation channel and to the west of it on the approaches to the Cocked Hat navigation post.

The outbound ferry moved along the river as the last of the fleet was approaching the Cocked Hat Bend area and no problems of space in the river or wind shadow were noted.

On the second spell in the river two fleets of dinghies were racing, starting from the LTSC line in the river. (Figure 4)

Figure 4: Dinghy Start: Wayfarer fleet

A Wayfarer fleet started first, followed by a menagerie fleet comprising a number of different classes. As can be seen from Figure 4, the starts occurred prior to the ferry's

departure and both fleets were well down the river and out of the channel before the ferry arrived (Figure 5).

Figure 5: Dinghy Fleet out of Channel in Long Reach

Low water occurred while the dinghies were racing in the Solent, the leading boat approaching the Cocked Hat Bend area about an hour after the tide was at its lowest for the evening. Even so, the height of tide was still low at around 0.8 to 0.9 metres. This was sufficient, however, to allow the returning dinghies to pass outside and to the west of the channel on the approach to Cocked Hat (Figure 6), helped by the fact that they were on a close reach with, perhaps, the centreboard wholly or partially raised.

Figure 6: Dinghies Sailing outside Channel with Tide Height about 0.8m

The inbound ferry moved up the river and along Horn Reach, staying more or less in the middle, with room for dinghies to pass on either side (Figure 7). At the wave screen,

some of the smaller boats opted to pass through the aperture to the north of the main opening and this kept them well away from the ferry track (Figure 8).

Figure 7: Ferry in Horn Reach and Dinghies

Figure 8: Dinghies Passing through Wave Screen Aperture

Even though a number of races took place during the observation period, no problems were noted in any interaction between the ferries and the sailing craft. Race timings were such that the ferries were not moving in the river when the bulk of the dinghies were in transit, the traffic in the river being otherwise light. It would seem, therefore, that, if packets of high density traffic move along the river (such as a fleet of dinghies while racing), sensible timing of race starts and ferry movements could minimise the

interaction between the leisure users and the commercial ferry operations. This was demonstrated convincingly during the observation periods.

Ian W Dand
26 June 2009

RS Dinghy Open Meeting, 4 July 2009

Memo to: Julian Lockett, BMT Isis
Cc: Ian Dand, Ryan Willigers
Date: 4th July 2009
Re: Observations on Lymington River, 4th July 2009

Attendance Record:

Arrived harbour office	0930
Boarded harbour Master RIB	0945
Left HM RIB	1245
Boarded Wight Light	1330, Captain Phil Husband/Ian D
Left Wight Light	1445
Boarded Sky	1520 Captain Wendy Maughan
Left Wight Sky	1800

Observations

I have only recorded remarkable events in this memo. The purpose of the attendance was to see the operation of W Class ferries on a day when the RS Class dinghies were holding a big event and X Boats were sailing.

1) The RS fleet of about 100 boats launched between about 1200 and 1230 and was fairly was very well organised and controlled.
   There was an incident when an RS struck a passing motor boat a slight and glancing blow, but the WIGHT SKY manoeuvred into the Lymington berth through the launching fleet without observed (From the HM Rib) difficulty. There was a light Southerly Breeze at the time. The RS dinghies sailed down the river to the Starting Box areas without incident.

Figure 1: WIGHT SKY approaching Lymington berth during RS launching

At 1247 we were alerted by as series of short blasts from the ferry as we were following her in to Lymington, approaching the wave screen. This was the result of a motor launch, the "Captain Rouse" navigating in the middle of the channel, blocking the ferry passage.

Wight Light (Captain Phil Husband)

Ian Dand and I took the opportunity of sailing together on the Wight Light with Captain Phil Husband just after the crew change. The trip to Yarmouth in a Southerly force 3 was uneventful. The traffic on the river was light and the RS racing was to the East of the Starting Box. We Disembarked in Yarmouth at about 1425.

Wight Sky (Captain Maughan)

The return trip was made on the Wight Sky, departing Yarmouth at 1527. The trip was also uneventful with light river traffic and no incident. One yacht under power did overtake the ferry as it was passing the wave screen, making its way into the marina.
Ian Dand left the Wight Sky at 1620 to observe the river from the HM RIB.
The outbound trip took place as the X Boat fleet was returning with the Folk Boats. The X Boats were sailing out of the channel, between the rows of boats moored on the approach to the Wave Screen.

Figure 2: F boats returning to Lymington passing the WIGHT SKY. Wind shadow clearly visible.

Some four Folkboats navigating down the East of the channel between 1640 and 1643 did experience some wind shadow effect from about two points abaft the ferry beam to about 6 points abaft the beam (see picture) in the light winds prevailing. The remainder of the crossing went without incident.

The Wight Sky left Yarmouth at about 1705 and entered the river at about 1735. The first observation was the heavy dinghy traffic returning to Lymington from racing. Generally this traffic kept out of the channel and caused the ferry no difficulty.
At about 1737 we did observe heavy wash from the Nauti Bear (outbound at about No 6).

Figure 3: Wash created by the NAUTI BEAR observed from WIGHT SKY

A potentially serious incident occurred as the Wight Sky and Wight Light were passing in the passing place at about 1740. Three RS craft, Nos 1016, 943 and 1114 were behaving as though racing in the channel, with full spinnakers flying. They opted to try and overtake the Wight Sky, passing between her and the outbound Wight Light in the middle of the channel. One nearly capsized and this behaviour did cause alarm on the Wight Sky bridge. (see photograph below.)

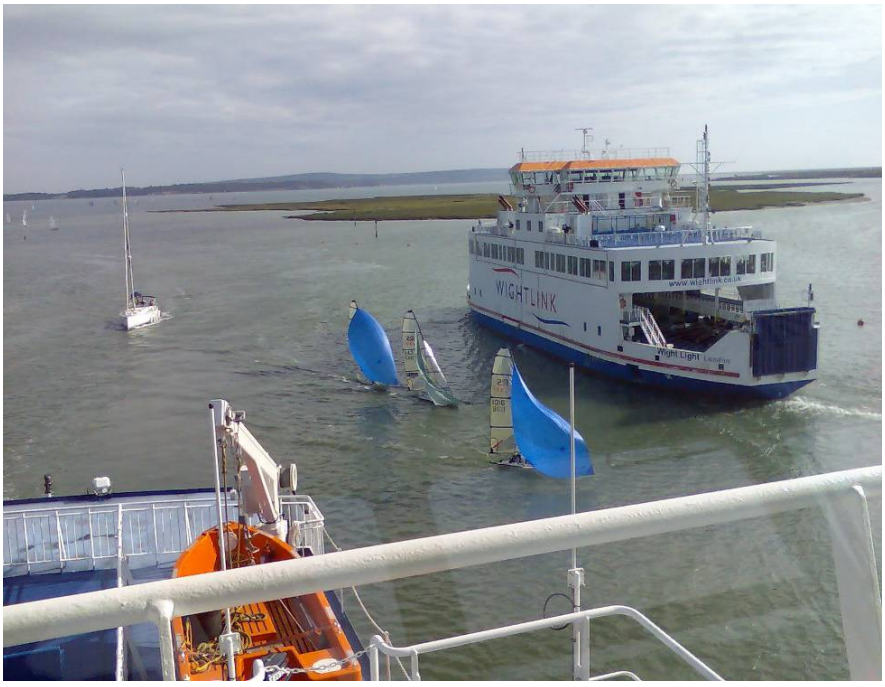

Figure 4: RS craft overtaking WIGHT SKY

John Noble

5th July 2009

Observations of Traffic Activity, 4 July 2009

TRAFFIC ACTIVITY ON THE LYMINGTON RIVER: SOME OBSERVATIONS ON 4 JULY 2009

1. Introduction

These notes relate to observations made on the Lymington River on 4 July 2009 during the period when the following activities were taking place:

- XOD and Folkboat racing in the Solent, requiring the fleet to sail down-river to the start and return again after racing;
- An open meeting of RS dinghies, organised by the Lymington Town Sailing Club (LTSC);
- "Two-boat" and "three-boat" operation of the Wightlink ferries Wight Sun, Wight Light and Wight Sky, the two-boat on an hourly timetabled schedule with the three-boat on a 40 minute timetabled schedule.

Observations took place over three periods, the first being on the bridge of the Wight Light from 0945 BST to 1430 BST, the next on the Wight Sky from 1520 BST to about 1600 BST and finally on the river from about 1630 BST to 1800 BST to witness the return of the RS dinghies and other river traffic. Captain John Noble was on the river in the morning and on Wight Sky in the afternoon, as described by him in Reference 1.

Tidal levels for the whole observation period were measured by the Channel Coastal Observatory (CCO) at the RLymYC Starting Platform. They are shown in Table1:

Time (BST)	Tide (m)
09:30	2.77
10:00	2.81
10:30	2.83
11:00	2.82
11:30	2.80
12:00	2.76
12:30	2.64
13:00	2.42
13:30	2.13
14:00	1.84
14:30	1.62
15:00	1.47
15:30	1.46
16:00	1.55
16:30	1.68
17:00	1.82
17:30	1.95
18:00	2.03

Table 1 Applicable Tidal Conditions

Low water in the river was predicted to be 1.34 metres at 1518 BST; atmospheric pressure was around 1013 mb during the day.

Wind speeds and directions were also measured at the RLymYC starting platform and given in the CCO and LHC web sites, the latter providing information from Richard Paul Russell Ltd. The results are shown in Figure 1.

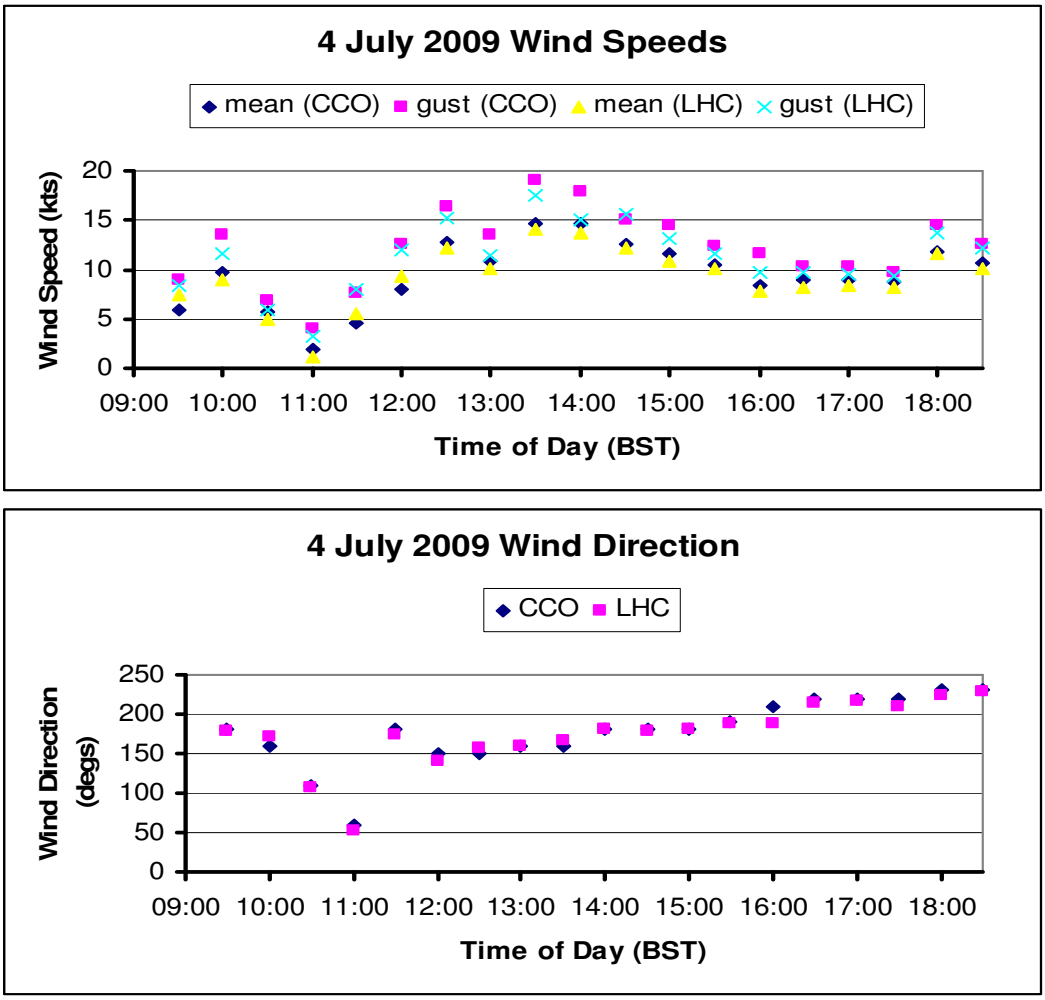

Figure 1: Wind Measurements

2. Observations

2.1 On the Wight Light and Wight Sky

I joined the Wight Light at about 0945 with Captain Martin Adams in command, relieved by Captain Phil Husband when the shift changed. Initially a two-boat service with Wight Sky was in operation; the third boat (Wight Sun, on the "middle turn") was lying at the Freshwater berth, eventually to slot into service between the Wight Light and Wight Sky.

On leaving the Lymington linkspan after joining the ferry, river traffic was very light and adhering well to the ColRegs by keeping well to starboard of the channel. Neither the Wight Light or Wight Sun flew an ensign or house flag, but the Wight Sky flew both with good ensign discipline. Sound signals were used on both Wight Light and Wight Sky as

necessary. Having not travelling on Wight Sun, it is not possible to comment on her use of sound signals. "Full" forward and "slow" aft thruster settings were used (and noted) on all observed river passages on both ships.

Passage to Yarmouth was generally handled with the mate on the con from the centre of the bridge for the river, and other crew members for the Solent crossing. Berthings were carried out from the appropriate bridge wing. All handovers from one location to the other were carried out smoothly, with no incident.

During the initial passage in the Solent, it became clear that, due to heavy passenger numbers at Yarmouth, turn round of the Wight Sky at Yarmouth was very slow and the vessel was behind schedule. The W-class are limited to 379 passengers and the Wight Sky was taking aboard 370 for her next sailing.

Once the Wight Light berthed at Yarmouth another source of delay manifested itself. The lanes on shore in which the next load for the Wight Light was mustered were full and road traffic in Yarmouth near the terminal was relatively heavy. As a result, the vehicles unloading from Wight Light were held up once they reached the roundabout outside the terminal, with the queue stretching back into the ferry, thereby delaying unloading which was finally completed some 8 minutes after arrival. Figure 2 shows the situation once things had eased, but the source of congestion and delay are apparent.

Figure 2: Unloading and Potential for Congestion at Roundabout

It became clear that the timetable had already slipped due to the practical problems outlined above.

This was complicated further on the return passage to Lymington when it became apparent that the Wight Sun, due to enter service as the third boat on the middle turn, was having trouble starting all her engines while on the Freshwater berth. At one point her master was of the opinion that he would have to miss his first trip due to this, but, while the Wight Light was inbound, all the Wight Sun engines were restored to full operation. The bridge teams of the Wight Light and Wight Sun then came up with a solution to allow the Wight Sun into service in the right slot and without causing any further delay. As the main demand for the ferry was at Yarmouth rather than Lymington, due to the amount of traffic there, it was decided, and agreed with the Terminal Controller, that Wight Light would lay-by briefly at the South End berth while Wight Sun passed her from the Freshwater berth to go on passage to Yarmouth empty. This manoeuvre was accomplished successfully (thanks in part to members of the Harbour Master's staff having to act as makeshift shore staff to let go the Wight Sun's moorings) and the Wight Light then manoeuvred to the Lymington linkspan to unload. This was carried out with some further delay because her Master was not keen to use the thrusters when he would have liked due to the presence of small craft in the vicinity of the manoeuvre and the need to protect them from slipstream effects.

A consequence of this sequence of events was a further delay to the schedule due to the fact that Wight Sun, in going straight to Yarmouth from the Freshwater berth had not picked up any stores and had to do so on her next visit to Lymington.

Although such matters have been described in some detail and may be thought to have little relevance to those sailing on the river, it led, indirectly, to ferries having to wait in the region of the river mouth, reduce their speed in the river in order to pass at the Short Reach lay-by area and pass along Horn Reach at non-scheduled times. All of this affected the leisure traffic to a greater or lesser degree, and would have had additional effects if racing had been taking place in the river with starts (or fleet passage down-river to a start in the Solent) linked to the ferry schedules.

Passage of the RS dinghy fleet down the river to their start in the Solent was not witnessed from the Wight Light which was at Yarmouth at the time; Captain Noble, on the river at the time, did witness the fleet departure however.

Thrusters were turned off once the ferry was berthed at Lymington, although, as described in Section 2.2 below, there was evidence of significant thruster use on berthing there on at least one occasion. In this regard, it was noted that the Wightlink shiphandlers adjusted the thruster settings to "half"/"half" (or "two blues") for berthing at both Lymington and Yarmouth with a view to getting an equality of thrust fore and aft, and sufficient thrust power at each end of the vessel. This, and its consequences for leisure craft, is discussed further in Section 2.2 below.

With the Wight Sky in service, passing manoeuvres were carried out in the Short Reach Lay-by area, as well as in the Solent, with the vessels working on the timetabled 40 minute service. Leisure craft lane discipline was generally good in the river, but there were some occasions when it could have been improved; Figures 3 to 5 show examples.

In general the speed limits were adhered to by most vessels. The ferries appeared to keep strictly to the 4 and 6 knot limits, as did most of the leisure craft, although there were a few exceptions with the smaller and faster craft such as RIBs and Zap-Cats.

Wind shadow effects noted from the ferry were mostly those affecting the larger sailing vessels; they were generally minor, and over quickly. This was not the case with the dinghies as will be described in Section 2.2 below. However, an incident with a Folkboat is relevant and Figure 6 serves to illustrate this.

Figure 3: Traffic discipline in Long Reach

Figure 4: Traffic Discipline in Long Reach with some vessels on wrong side of channel

Figure 5: Traffic discipline in Long Reach with one vessel on wrong side of channel

Figure 6: Folkboat in Wind Shadow

As the Wight Light was approaching the Lymington linkspan, the Folkboat was seen to be tacking down-river in the vicinity of the terminal. Having completed a tack on the west side of the channel and having no room to tack again, it turned roughly head-to-wind and used its momentum to pass between the berthing ferry and the moored yachts. Having virtually no control, it was at the mercy of the wind as affected by the ferry, and

the thruster slipstreams. This resulted in the yacht being turned at right angles so that, at the time the photo was taken, it was moving slowly toward a moored yacht. It was fended off and turned manually by the crew member on the bow, after which it caught the steady wind again and continued tacking down-river. It is not clear whether, having seen the Folkboat initially, this part of the incident was witnessed by the bridge team on the ferry.

While on board the Wight Light, an attempt was made to download a screen dump from the radar in order to assess the traffic density in the river, in compliance with the requirements of the study. On reading the manual, it soon became clear that, unlike the ECDIS, such a facility was not available on the radar, so a few photos of the screen were taken. Figure 7 shows one in which the large amount of sailing traffic in the Solent at 1250 on the day can be seen.

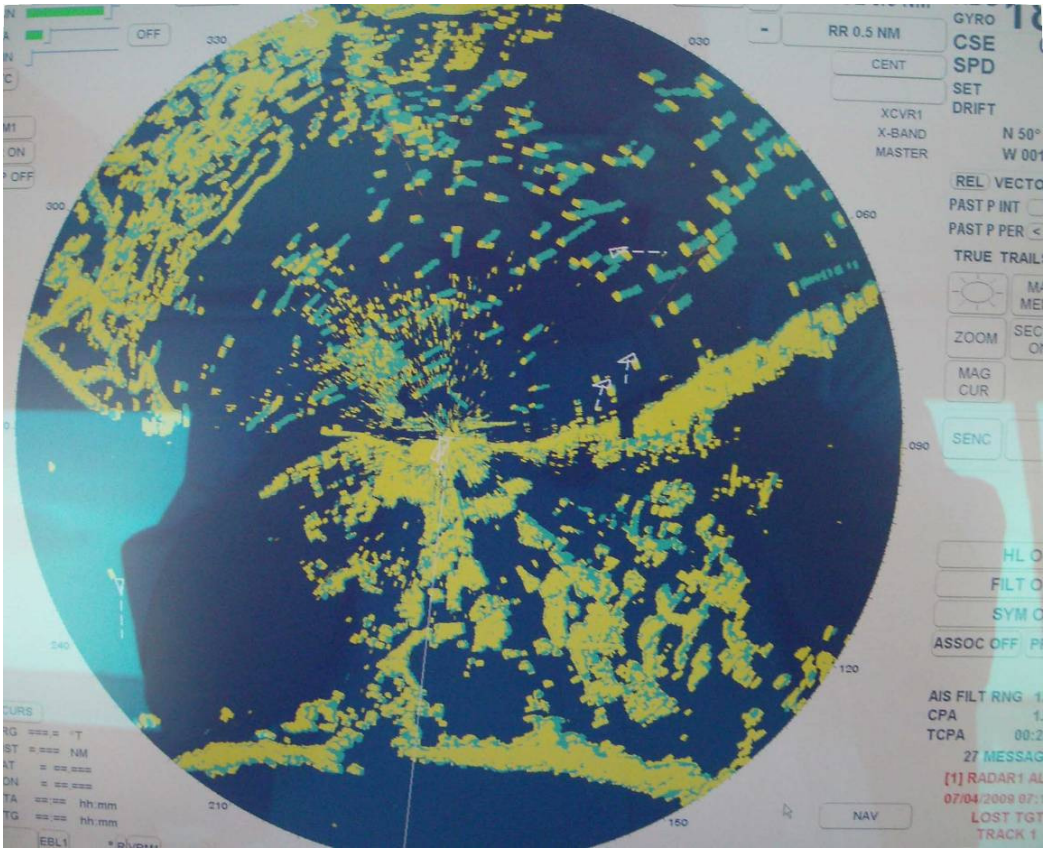

Figure 7: Radar Screen showing Sailing craft in Solent; Wight Light in Yarmouth

Further runs on Wight Light and one inbound run on Wight Sky (with Captain Wendy Maughan in command) were uneventful, although the timetable delays persisted, leading to the ferries either having to wait outside the river for extended periods, or make slow river passages due to the late departure of the outbound vessel.

Several passing manoeuvres in Short Reach were witnessed; none caused the ferries any handling or other problems in the comparatively high neap tides on the day.

2.2 On the River

When arriving on the river, the RS races were finished and the fleet was returning to the Lymington public slipway.

On passing down river, the Wight Light, inbound, was passed in the region of Cocked Hat with an orderly queue of leisure craft astern. The tide was beginning to flood and the ferry was keeping to the correct side of the channel; Figure 8 illustrates the situation.

Figure 8: Leisure craft following the inbound ferry

When the Wight Light then returned outbound down the river, it passed the Wight Sky inbound in the Short Reach lay-by. The Wight Sky also had a queue of small craft following her in as shown in Figure 9.

Figure 9: Wight Light (on the right) and Wight Sky passing

At this time (1743 BST) the mean wind was about 10 to 15 knots from a south-westerly direction (Figure 1 - Wind Measurements) and, as can be seen in Figure 9, two RS dinghies off the Wight Sky's port quarter were flying spinnakers and reaching. The crews in two of these dinghies were seen to be standing in the boat or on the weather outriggers. What happened next has been described by Captain Noble in Reference 1 and vividly demonstrated the effect of the ferry wind shadow on high-performance sailing dinghies.

Once the two ferries had passed, the RS dinghies moved out to the port side of the inbound ferry, possibly with the intention of overtaking it. As they did so, they moved into the wind shadow of the outbound ferry and not only suffered a loss of wind speed, but also a large, and temporary, change in wind direction. Such effects were demonstrated in some detail in Figures A5.9, A5.10 and A5.11 of Reference 2 which show measurements of changes in wind direction of the order of 150° or more in wind shadows from both the C- and W-classes. This effective reversal of wind direction, combined with the fact that the crews of the RS dinghies were sitting well out when the wind dropped and reversed, caused the three boats concerned heel rapidly to "windward", one after the other.

This sequence is shown in Figure 10.

Figure 10: Effect of Ferry Wind Shadow on three RS dinghies

The progressive nature of the incident can be seen clearly from the sequence, as can the fact that, in the last of the sequence, the first boat of the three is again in clear wind and beginning to reach away. All three boats recovered well and none of them capsized.

The same could not be said for the next group of RS dinghies, seen in the background of the photos in Figure 10 and moving up-river on a reach without spinnakers set. Having

seen their fellow sailors caught in the ferry wind shadow, they were caught in the same way as they passed the outbound Wight Light, the ferry by this time having rounded the Tar Barrel mark. The same progressive loss of wind occurred and one of the dinghies in the group did in fact capsize as shown in Figure 11.

Figure 11: Capsized RS dinghy

It was soon righted by the crew who resumed sailing with, apparently, no ill effects.

A passing comment on these incidents seems appropriate. Much has been said about wind shadow from the W-class ferries in the past year, and it has been shown in Reference 2 that wind speed will drop, and wind direction change, dramatically while in the shadow. It is possible that the crews of the RS dinghies involved in the above incidents were unaware of these effects near a ferry, or indeed from which direction, relative to the ferry, the wind would come; as they were taking part in an open meeting, they may well not have local to the area and unfamiliar with such effects. Nevertheless, they also sailed in to the shadow with, in some cases, all sail set in a good sailing breeze and the crew deployed to counter the no doubt significant heeling moment from the sails. Loss of wind (and reversal of its direction) was therefore bound to cause a dramatic heel to windward, a consequence demonstrated only too vividly on the river. It would seem not unreasonable for the dinghy sailors to anticipate the effects of the shadow and be ready to deal with them by sailing rather more circumspectly in the vicinity of the ferries.

It is suggested that it would perhaps be wise to brief those sailors unfamiliar with the river with such effects from the ferries and it is possible that the photo sequences shown above could be worked into a simple briefing note for this purpose.

While ferry wind shadow has been a much-debated topic in the Lymington marine community over the past 12 months, so also has the topic of thruster slipstreams and their effect on leisure craft. A clear demonstration of this was given when the Wight Sky, inbound in the photo sequence of Figures 9 to 11 above, was berthing. It is understood that the mate, rather than the master, was in control and it soon became clear that significant stern thruster power was being used, resulting in the severe slipstream shown in Figure 12.

Some leisure craft were passing the ferry at the time and the effect on a yacht, motoring past, is shown in Figure 13.

Figure 12: Aft Thruster Slipstream while Berthing

Figure 13: Effect of Thruster Slipstream on Passing Leisure Craft

It is clear that the effect of the slipstream on the passing keelboat was quite severe, although it is not known to what extent avoiding action was taken on board the yacht. Its keel would have been affected by the vorticity in the thruster slipstream beneath the water surface and the resultant excursion, while not enough to take the yacht into the nearby moored vessels, was large.

While the use of "half"/"half" thruster settings for berthing a ferry is understood, it is suggested that the following should be borne in mind:

- When on such a setting it is possible to produce excessive slipstream activity if the percentage power used is too high;
- Checks should be made to see what leisure craft are passing, or about to pass, the berthing ship and thrust adjusted accordingly, as was witnessed on the Wight Light earlier in the day when manoeuvring back to the linkspan after allowing Wight Sun to pass;
- It appears that the "half"/"half" setting is activated at variable locations along Horn Reach, presumably due to the weather conditions at the time, rather than on the whim of the bridge team. If done early, and excessive percentage power used, it can cause problems for nearby leisure craft. It is suggested that a location for the earliest activation of the "half"/"half" setting is agreed with Wightlink to avoid undue disturbance to leisure users in Horn Reach;
- If high percentage powers must be used while in the "half"/"half" setting, the duration must be as short as possible if leisure craft are in the vicinity.

3. References

1. Noble, Capt J: "Observations on Lymington River, 4 July 2009" Notes for BMT Isis Ltd, July 2009

2. "Ferry Operations at Lymington: the W-class Ferries" BMT SeaTech Ltd Report on project C13537.01. Document C13537.01.R01.V7, 5 May 2009

Ian W Dand
6 July 2009

Evening Keelboat Racing, 9 July 2009

TRAFFIC ACTIVITY ON THE LYMINGTON RIVER: SOME OBSERVATIONS ON 9 JULY 2009

1. Introduction

These notes relate to observations made on the Lymington River on the evening of 9 July 2009 when the following activities were taking place:

- XOD, RS Elite and Folkboat racing in the Solent, requiring the fleet to sail down-river to the start and return again after racing
- Keelboat racing in the Solent comprising handicapped classes of various sizes; this fleet also sailed down the river to the start off the RLymYC Starting Platform, returning up-river after the racing.
- "Two-boat" operation of the Wightlink ferries Wight Sun and Wight Light, on an hourly timetabled schedule.

Observations took place over a single period on the river from about 1730 BST to 1945 BST to witness traffic movements, both inbound and outbound, during the period of racing. Captain John Noble was also in attendance.

Tidal levels for the whole observation period were measured by the Channel Coastal Observatory (CCO) at the RLymYC Starting Platform. They are shown in Table1:

Time (BST)	Tide (m)
17:00	1.98
17:30	1.51
18:00	1.18
18:30	1.05
19:00	1.10
19:30	1.29
20:00	1.53

Table 1 Applicable Tidal Conditions

Low water in the river was predicted to be 1.18 metres at 1832 BST; atmospheric pressure was around 1016 mb during the day.

Wind speeds and directions were also measured at the RLymYC starting platform and given in the CCO and LHC web sites, the latter providing information from Richard Paul Russell Ltd. The results are shown in Figure 1 from which it is seen that the wind speeds were a fairly steady 15 to 20 knots from a north-westerly direction.

2. Observations

As no ferry passages were undertaken on this occasion, all observations below were obtained on the river.

As seen in Figure 1, mean wind speeds were less than 25 knots and it was clear that the ferries were using the "full forward/slow aft" thruster settings. Ensign discipline was good on both vessels and sound signals were used as required.

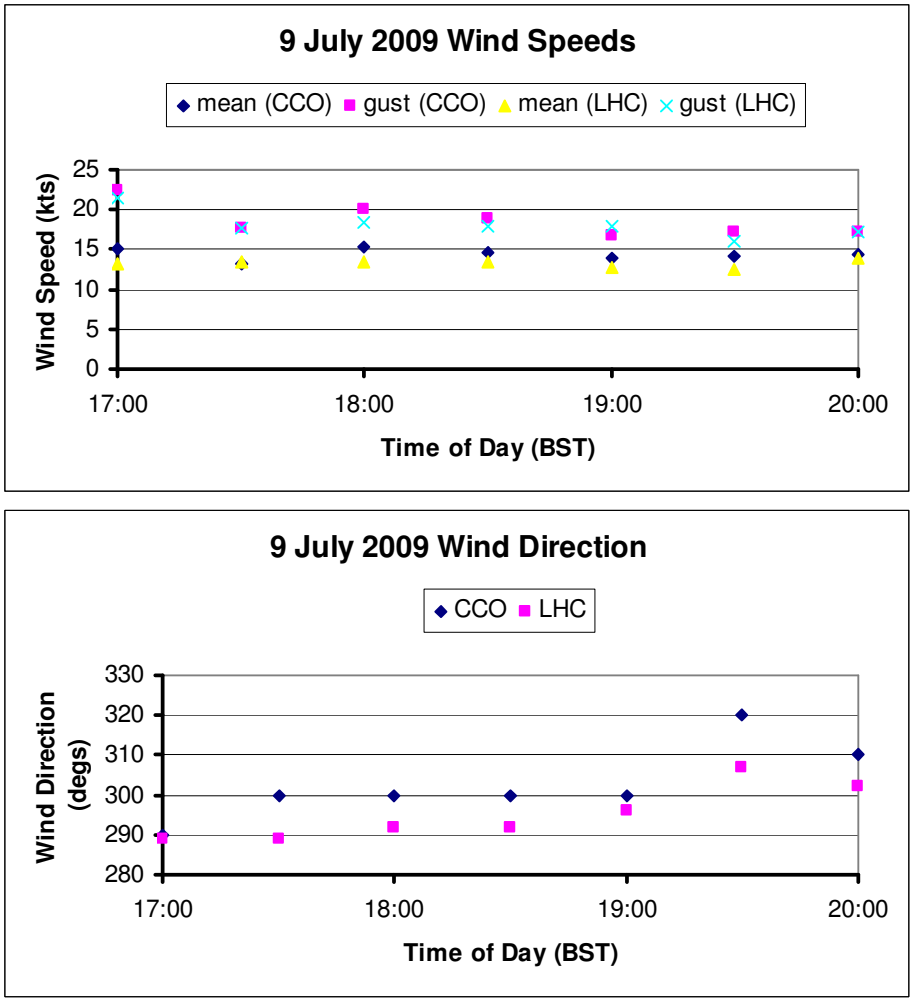

Figure 1: Wind Measurements

As an example, the Wight Sun, on returning from Yarmouth, encountered the XOD/Folkboat fleet racing across its path. The ferry sounded three short blasts, went astern and stopped as shown in Figure 2.

Figure 2: Ferry stopped to give way to sailing vessels.

This, of course, was an example of the ColRegs in operation because the yachts were the stand-on vessels and the ferry the give-way vessel.

Adherence to the ColRegs by all users in the river was fair. Figure 3 shows outbound sailing vessels in Long Reach with the inbound ferry at its seaward end.

Figure 3: Traffic in Long Reach: Ferry at Seaward End

It is seen that not all the outbound vessels were keeping to the starboard side of the channel. However, as the ferry continued along the Reach, keeping to starboard and leaving room for small craft outside her, the outbound traffic all moved to the correct side of the channel as shown in Figure 4.

Figure 4: Re-distribution of Traffic in Long Reach as Ferry Approaches.

The timing of the races and the ferry timetable were such that most of the outbound sailing vessels were able to move well down the river before encountering the ferry, Figures 3 and 4 showing the one period of encounter observed. No problems were noted for the sailing vessels or the ferries.

However, a small number of those sailing in the evening mentioned how shallow they believed the river to be in various places, and were of the opinion that this reduction in depth had occurred recently. One area mentioned was in the known shallow patch in the general vicinity of Number 7 post where the inbound ferry tripped the breaking wave shown in Figure 5 for a brief period. Another area was in the Solent where one of the larger keelboats was felt to have touched bottom; other leisure users asserted that the ferries had recently grounded "at least three times in the river". No dates, times or locations were given to support this assertion, however.

Once the racing was finished, the sailing fleets returned up-river and those that elected, or had, to sail needed to beat up the river in the prevailing north westerly wind. An inbound ferry did occupy the river around this time and it was noted that it had lookouts posted on each bridge wing, as shown in Figure 6.

Figure 5: Breaking Wave in Shallow Region outside Channel in Long Reach

Figure 6: Lookouts Posted on Both Bridge Wings: Inbound Ferry

Those yachts which had sailed as far as Horn Reach still had to tack near the ferry, but did so without apparent problems, timing the tacks with the ferry speed and location to pass safely clear.

In summary, our feelings are that, although there was a fleet of around 50 yachts moving in the river and crossing the ferry tracks in the Solent, all those involved behaved well and in sympathy with each other, whether commercial or leisure users. No traffic conflict situations were observed and, even though low water coincided with movement of leisure traffic in the river (with a correspondingly increased traffic density), there was enough water space for all users.

Ian W Dand
13 July 2009

"Incognito" Run, 30 July2009

TRAFFIC ACTIVITY ON THE LYMINGTON RIVER: SOME OBSERVATIONS ON 30 JULY 2009

1. Introduction

These notes describe observations made on the Lymington River on the evening of 30 July 2009 when the following activities were taking place:

- XOD, RS Elite and Folkboat racing in the Solent, requiring the fleet to sail down-river to the start and return again after racing
- Keelboat racing in the Solent comprising handicapped classes of various sizes; this fleet also sailed down the river to the start off the RLymYC Starting Platform, returning up-river after the racing.
- "Three-boat" and "Two-boat" operation of the Wightlink ferries Wight Sun, Wight Sky and Wight Light, on a nominally 40 minute timetabled schedule for three boats and hourly for two boats.

The visit was not programmed in the main study, but was undertaken incognito because:

- It allowed an independent check of Harbour Master patrol activity on the river during evening sailing.
- It allowed a check on operational requirements such as bow door checks which are difficult, if not impossible, to observe visually when on the bridge.
- It allowed an assessment to be made of discipline on the river when users were not aware that observations were being made, causing them, perhaps, to be on their best behaviour.

Observations took place over a single period from about 1730 BST to 2000 BST in order to witness traffic movements, both inbound and outbound, during the period of racing. The outbound 1815 departure (Wight Sky, Captain Vaughan) from Lymington was chosen as being the nearest in time to the fleet sailing outbound down the river while the 1930 departure from Yarmouth (Wight Sky, Captain Vaughan) was chosen with a view to being on a ferry in the river while the fleet returned. In the event, the outbound fleet moved down river between the 1725 and 1815 timetabled departures, but their passage was visible from the 1815 ferry. The 1930 Yarmouth departure was indeed in the river as the tail end of the fleet was returning.

Tidal levels for the whole observation period were measured by the Channel Coastal Observatory (CCO) at the RLymYC Starting Platform. They are shown in Table1:

Time (BST)	Tide (m)
17:00	2.44
17:30	2.57
18:00	2.66
18:30	2.74
19:00	2.80
19:30	2.80
20:00	2.77

Table 1 Applicable Tidal Conditions

High water in the river was predicted to be 2.83 metres at 1851 BST; atmospheric pressure was around 1022 mb during the observation period.

Wind speeds and directions were also measured at the RLymYC starting platform and given in the CCO and LHC web sites, the latter providing information from Richard Paul Russell Ltd. The results are shown in Figure 1 from which it is seen that the wind speeds were a fairly steady 15 to 20 knots from a south-westerly direction.

2. Observations

Although all observations were made on board Wight Sky, they were from the sun deck and not the bridge. As a result, no information was obtained on thruster settings, tracks or on-board wind speeds and directions.

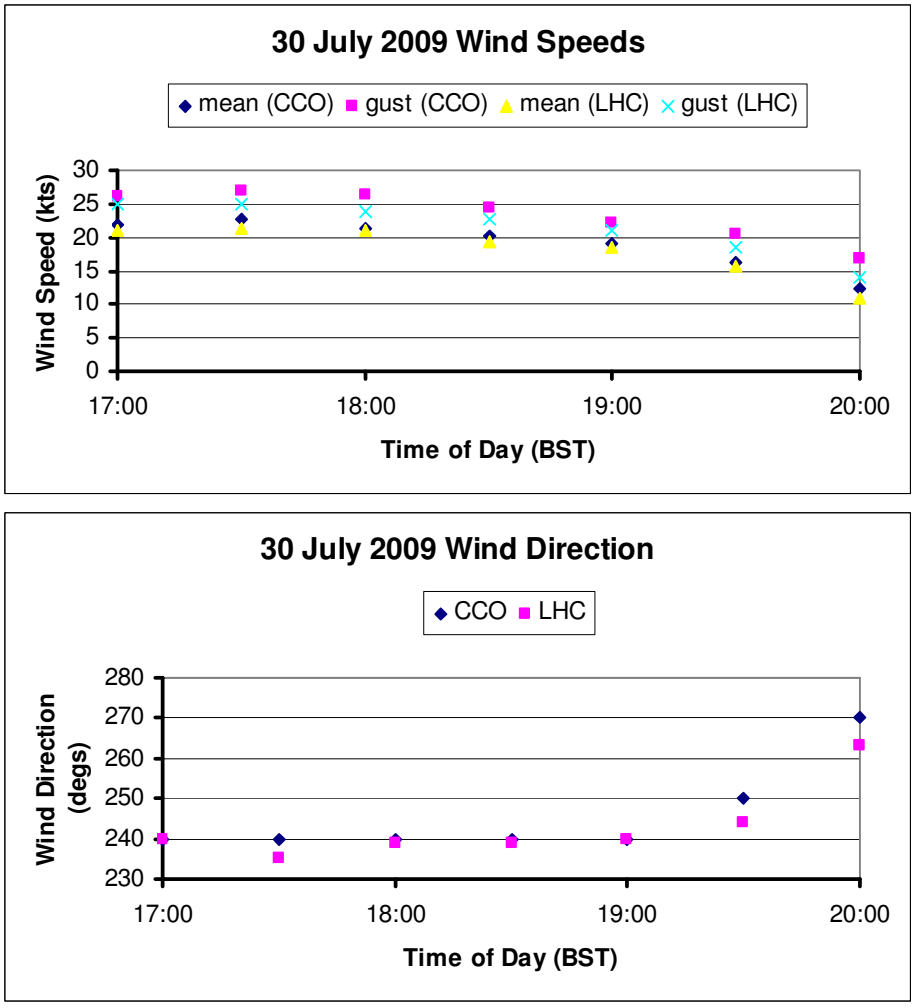

Figure 1: Wind Measurements

The following observations were made, however:

- When unloading at Lymington, two cars were sent ashore before any passengers were allowed to leave over the bow ramp. At Yarmouth the side door was used for passengers;
- The additional access ladders and lookout platforms at the Lymington end of Wight Light and Wight Sky were in place, as seen in Figure 2. It was not possible to see if this was the case in Wight Sun;
- The Wight Light 1725 sailing left Lymington at 1727, having waited for a yacht under sail outbound to pass the linkspan. Sound signals were used prior to moving as there was some sailing traffic in Horn Reach;
- The inbound boat (Wight Sky) was seen to be moving slowly along Long Reach at this time, in preparation for a Short Reach Lay-by passing;
- The Wight Sky 1815 sailing left Lymington at 18:16:37 after the bow door check had been carried out at 18:14. Ensign and house flag were flying correctly;
- By this time most of the sailing fleet was well down the river (Figure 3).

Figure 2: Lymington Lookout Platforms: Wight Sky and Wight Light

Figure 3: Sailing Fleet moving down River as Wight Sky Departs Lymington

- Both Harbour Master's RIBs were on patrol as shown in Figure 4. They are shown in the vicinity of the Harper's South post and were not observed further down river. One RIB was still on duty at the end of sailing when all yachts had returned; it is shown in Horn Reach at the end of proceedings in Figure 5.

Figure 4: Harbour Master patrols at Start of Observation Period

Figure 5: Harbour Master RIB on Patrol in Horn Reach at end of Observation Period.

- On leaving Yarmouth, the bow door check was done by a member of Wightlink shore staff as shown in Figure 6.

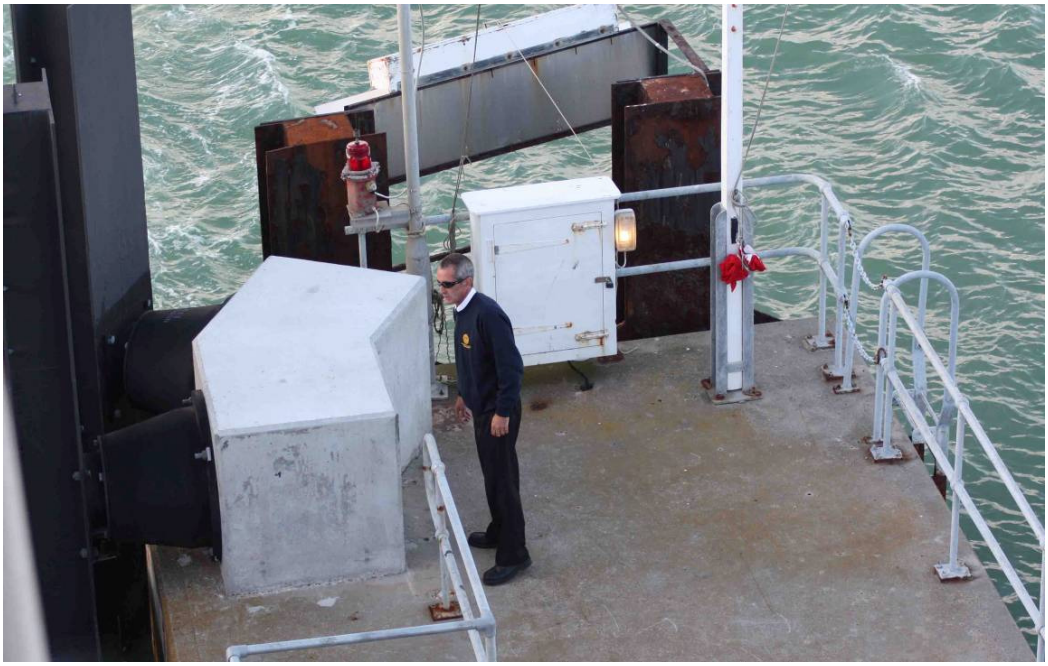

Figure 6: Shore Staff Checking Bow door at Yarmouth

- On returning to the river, it was clear that good lane discipline was being observed in Long Reach by the returning fleet. Initially, before the outbound ferry had entered the Reach, yachts were mostly on its starboard side but using as much of the available water space as they could. The tide had only just turned and there was plenty of depth and width outside the posts. Once the outbound ferry had

rounded Tar Barrel, any yachts in the Reach moved either to the starboard side, or outside the posts altogether, as shown in Figure 7;

- By this time the two-boat schedule was in operation and it became clear that the inbound Wight Sky was going to carry out a Long Reach passing manoeuvre with Wight Light (Capt Nicholls). (Figure 8). As the tide was still high and was nearly at the start of the ebb, with a mean wind less than 15 knots from the west, this was presumably deemed acceptable. It was carried out successfully, although Wight Light was close to Post 4, as shown in Figure 9;
- It was noted that Wight Sky, having flown both ensign and house flags outbound to Yarmouth, flew no flags at all when returning to Lymington;
- Passage upriver was uneventful. Most of the keelboats were by this time motoring back and the ferry stayed a sensible distance astern, making good passage up river, topped off by an excellent berthing, controlled entirely by the Mate (Andy) from the centre con;
- In general the behaviour of the leisure users on the river was excellent. Only one vessel, which appeared to be a visitor, showed poor discipline by wandering across the bow of the outbound Wight Sky at the seaward end of Long Reach. It appeared that the ferry had not been noticed by those on board, because, once it had, the boat ceased dawdling and moved smartly out of the way (Figure 10).

Figure 7: Yachts Keeping to Starboard in Long Reach

Figure 8: Wight Light about to pass Wight Sky in Long Reach

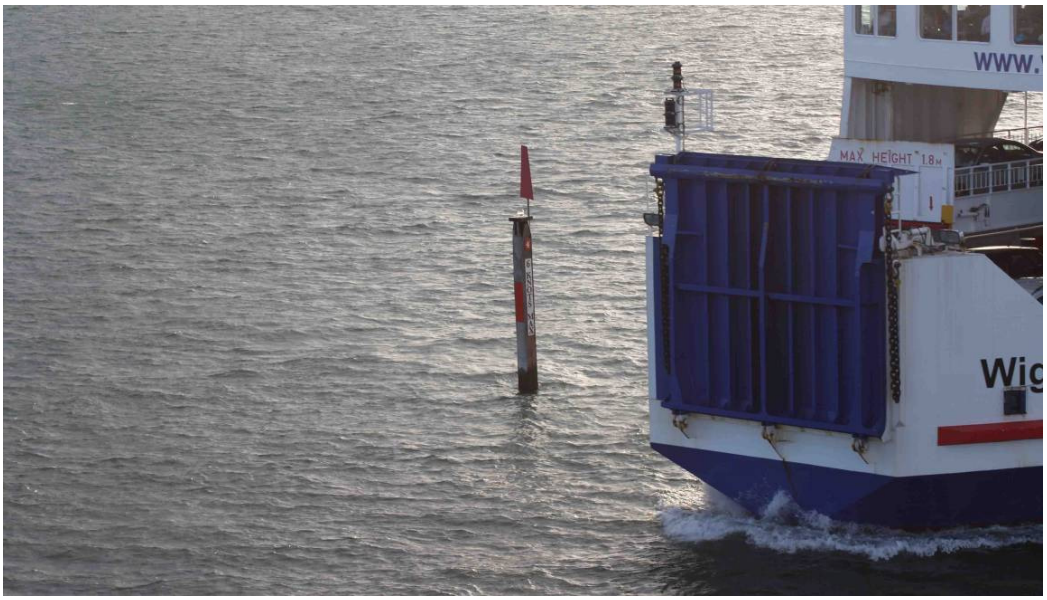

Figure 9: Wight Light passing Post 4 during Long Reach Pass

Figure 10: Yacht Ahead of outbound Wight Sky in Long Reach

This incognito exercise was useful in that it showed that most leisure users do obey the ColRegs and, when evening sailing takes place around high water, there is enough water space for ferries and leisure users to co-exist satisfactorily with no fuss. The bow door checks were carried out correctly at both ends of the route and ferry handling was of a high standard on all three vessels. Harbour Master patrols were present on the river throughout and their presence may well have influenced the good behaviour of the majority of the users. Finally, it was good to see that the additional access ladders and lookout platforms at the Lymington end of the ferries were in place.

Ian W Dand
31 July 2009

Weekend Sailing and LWS, 22 August 2009

Memo to: Julian Lockett, BMT Isis
Cc: Ian Dand, Ryan Willigers
Date: 28th August 2009
Re: Observations on Lymington River, 22nd 2009

Attendance Record:

Arrived harbour office	1130	
Boarded Wight Light	1200	Captain Adrian Whinney
Left Wight Light	1300	
Boarded Wight Sun	1350	Captain Roy Nichols
Left Wight Light	1445	
Boarded Wight Sky	1600	Captain Wendy Maughan

Observations

As before I have only recorded remarkable events in this memo. The purpose of the attendance was to see the operation of W Class ferries on a day when the tide was at its lowest (0.43m at 1835) when the river was expected to be busy at the time at the weekend during the peak holiday period. I have read the notes submitted by Ian Dand and can confirm I agree with all the observations recorded by him.

Wight Light (Captain Adrian Whinney)

Ian Dand and I took the opportunity of sailing together on the Wight Light with Captain Adrian Whinney. The trip to Yarmouth in a Southerly Light winds was uneventful. Just prior to sailing I was able to observe the interaction between a departing ferry and inbound traffic. A sound signal was made and the ferry left the berth fully aware of the traffic situation in the river. There have been reported difficulties, but the masters spoken (Whinney, Maughan and Nichols) to feel able to conduct this departing manoeuvre without additional guidelines.

Weather and tidal conditions are recorded in Ian Dand's notes.

Wight Sun (Captain R Nichols)

The return trip was made between 1355 and 1445; there was a long delay following operational difficulties experienced by the Wight Light.
The only issue of comment was the start of an X boat race at about 1405 when the racing fleet was started with a spinnaker "run" across the entrance to the river west to east directly in front of the incoming ferry. Captain Nichols recorded that this was not an unusual situation in his experience. In the event the Wight Sun had to wait so the X boat fleet passed ahead.

Wight Sky (Captain Wendy Maughan)

On the outbound run I was able to observe the inbound traffic, which was now building up (1600hrs) and noted that as the ferry approached the wave screen they waited until the ferry had passed, thereby avoiding a close quarters situation. Captain Maughan advised that this was quite usual behaviour and was a sign of the natural (and desirable) give and take between river users.
The trip was otherwise without incident even though the inbound traffic was probably at its peak (1745hrs).

Harbour Master's Boat (with Ryan Willegers)

Between about 1800 and 1900 I spent time on the HM Launch to observe at river level the conduct of river users at dead low water springs. (1835hrs observed height at 1810 was 0.24m)

At about 1825 hrs the Wight Light (in) and Wight Sky (out) passed in the passing area . Being almost dead low water, the ferries were going at speeds commensurate with the low tide. River traffic following the Wight Light inbound had no trouble coping with the situation and formed an orderly queue. There was plenty of room in the river for the ferries to pass safely, without affecting other river users, who behaved sensibly.

I witnessed no circumstances that give rise to specific comment in these notes.

John Noble 28th August 2009

Observations on 22 August 2009

TRAFFIC ACTIVITY ON THE LYMINGTON RIVER: SOME OBSERVATIONS ON 22 AUGUST 2009

1. Introduction

These notes describe observations made on the Lymington River on 22 August 2009 when the following activities were taking place:

- General leisure boating activities;
- Some XOD, RS Elite and Folkboat racing in the Solent;
- General, and quite extensive, keelboat activity in the Solent;
- "Three-boat" operation of the Wightlink ferries Wight Sun, Wight Sky and Wight Light, on a nominally 40 minute timetabled schedule.

The date was chosen as it saw one of the largest spring tides of the year with a predicted low water of 0.43 metres at around the time in the evening when leisure traffic was expected to be returning to Lymington. Observations took place over a single period from about 1230 BST to 1830 BST to witness traffic movements, both inbound and outbound, during the period of racing. Capt Noble and I carried out the observations; I remained on the Wight Light (Capt Whinney) for the whole period, obtaining ECDIS downloads for six passages, while Capt Noble moved to other ferries after Wight Light (with Capts Maugham and Nicholls) before joining the Harbour Master on the river for observations around low water. His separate report gives his impressions of the day.

Tidal levels for the whole observation period were measured by the Channel Coastal Observatory (CCO) at the RLymYC Starting Platform. They are shown in Table1:

Time (BST)	Tide (m)
12:00	2.91
12:30	3.19
13:00	3.18
13:30	3.00
14:00	3.03
14:30	3.10
15:00	3.12
15:30	3.08
16:00	2.93
16:30	2.51
17:00	1.88
17:30	1.19
18:00	0.68
18:30	0.44
19:00	0.51

Table 1 Applicable Tidal Conditions

High water in the river was predicted to be 3.47 metres at 1245 BST with low water predicted to be 0.43 metres at 1835; in the event high water recorded by CCO at the RLymYC Starting Platform was 3.22 metres at 1245 BST and low water 0.43 metres at

1840 BST. Atmospheric pressure was around 1023mb, dropping to 1022mb, during the observation period.

Wind speeds and directions were also measured at the RLymYC starting platform and are given in the CCO and LHC web sites, the latter providing information from Richard Paul Russell Ltd. The results are shown in Figure 1 from which it is seen that the wind speeds were between 5 and 12 knots from a southerly direction.

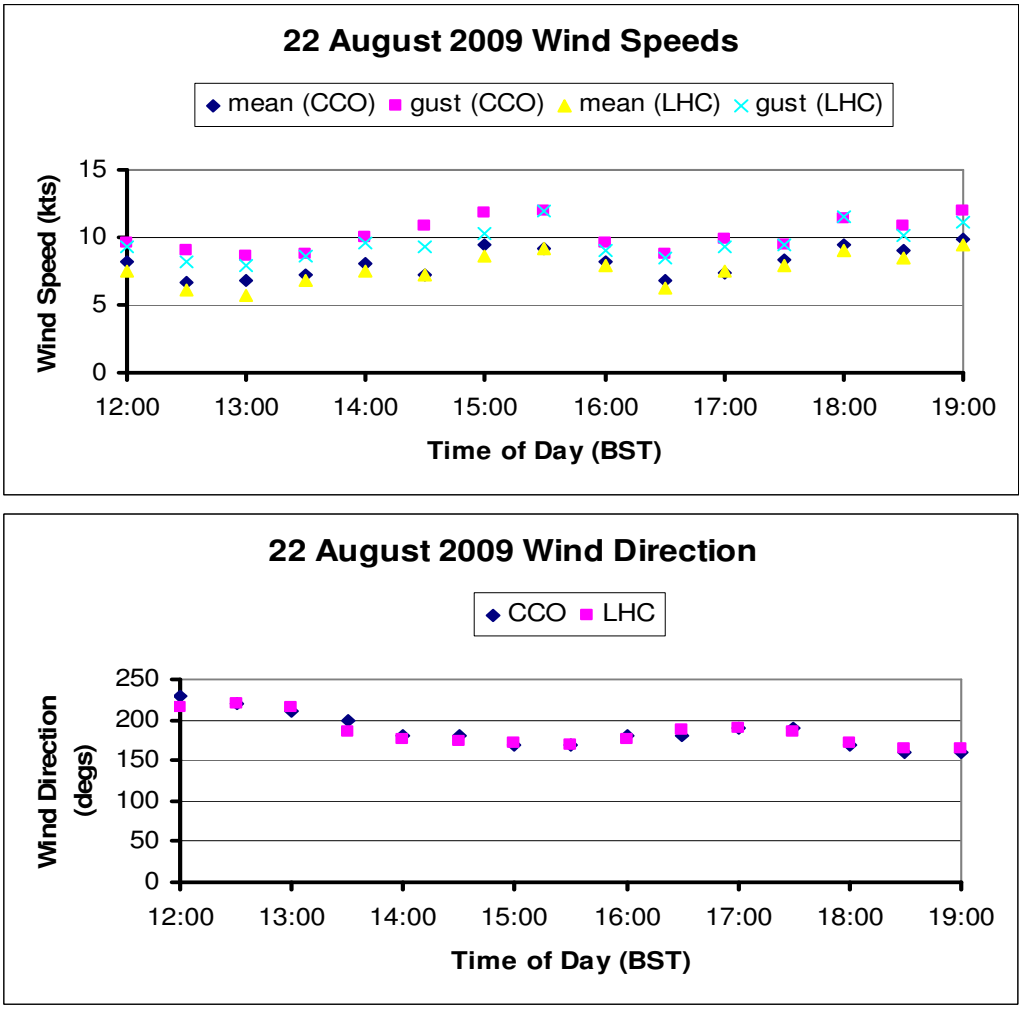

Figure 1: Wind Measurements

2. Observations

2.1 Ferry Operations

General

All observations were made on board Wight Light, where the "Full/Slow" thruster settings were used on the river throughout the day. Ensign discipline was good throughout and bow ramp reports were received for each passage; it was not possible to see physically from the bridge if the bow ramp was checked, but the master used one of the bow CCTV cameras to ensure that this was done. Sound signals were used as necessary, but single blasts on leaving the berth were not heard by BMT on the bridge.

Overground Speeds

Figures 2 and 3 show the overground speeds for the outbound and inbound runs, obtained from the GPS readings on the ECDIS.

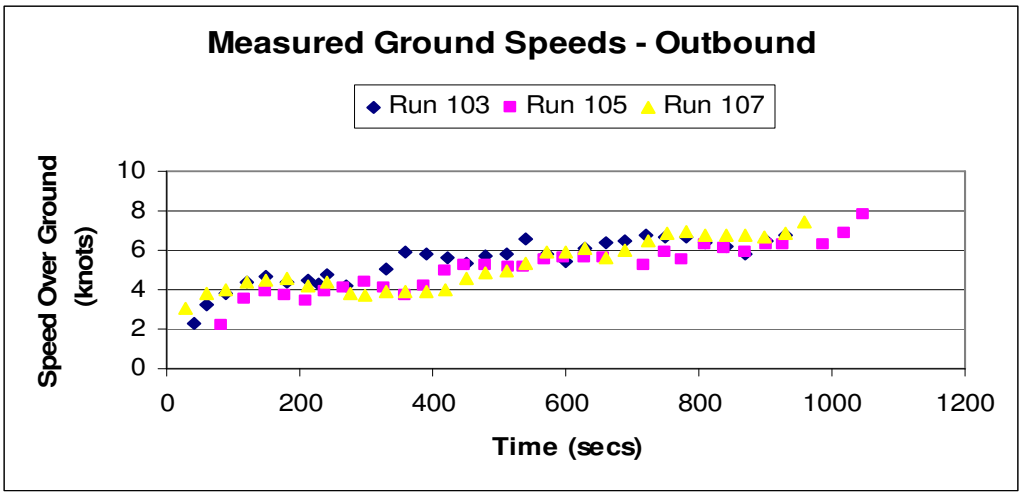

Figure 2: Measured Overground Speeds, outbound

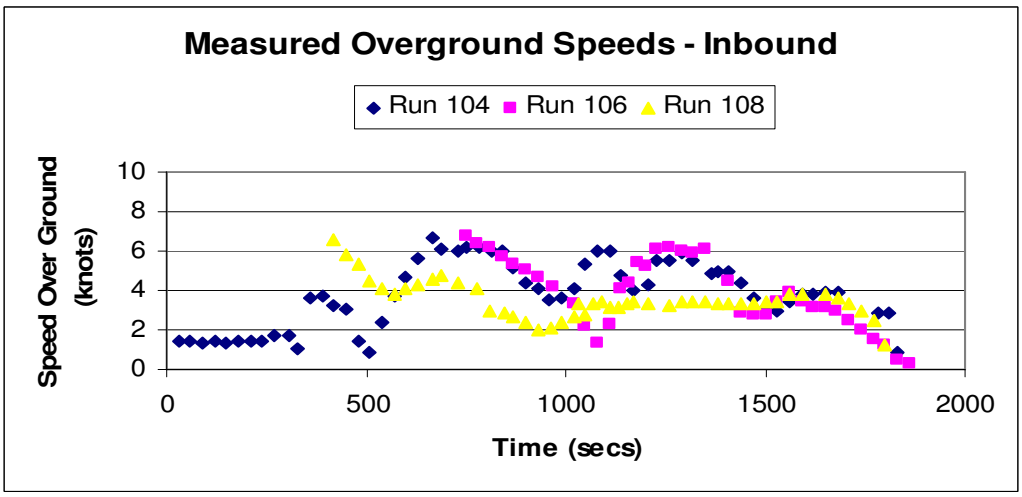

Figure 3: Measured Overground Speeds, inbound

Timescales in the inbound runs have been shifted to aid comparison; this ensured that all runs ended at approximately the same time.

It is seen that when outbound, speeds in Long Reach for two of the runs rose to values a little above the 6 knot limit, before increasing at the end of the Reach at the start of the Solent crossing. It should be noted however, that run 107 took place with the early ebb running so it was likely to have experienced a following current. The 4 knot advisory limit in Horn Reach was well observed.

Inbound run 104 was characterised by a period of some 5.5 minutes at low speed while the Wight Light had to wait at the mouth of the river for the outbound ship to leave the Lymington berth. Overground speeds in run 108 were generally low due to the fact that this passage was carried out in very low water conditions and these, together with the fact that a passing manoeuvre was carried out in the Short Reach lay-by, demanded that the ship was navigated with care and at a prudent, low, speed. The low speed on inbound run 106 just after the 1000 second timing was occasioned by the need to adjust timings to pass the outbound vessel in the lay-by. It is seen that, while in this run the 4 knot speed limit was adhered to inbound, the 6 knot limit was slightly exceeded in Long Reach.

Congestion at Yarmouth

An operational effect which occurred at Yarmouth is illustrated in Figure 4. In extreme cases, this can cause delays in loading/unloading there with knock-on effects on schedule, timing, speed in the river and waiting, with consequent effects on river users.

Figure 4: Congestion at Yarmouth Quay

It is seen that, due to a queue of traffic waiting for the traffic lights on the main road, cars leaving the ferry are blocked at the exit from the quay which in turn blocks cars wishing to unload or load.

Moored Yachts at Cocked Hat

Figure 5 shows how moored yachts near Cocked Hat intruded into the navigable channel. This was noted in the first outbound run close high water when the wind was about 6 knots from the south-west, setting the wind-rode vessel into the channel. It may be

noted that the mooring of boats in this region was not encouraged in the BMT Phase 2 report.

Use of the Leading Lines

It was noted that the ferries often, but not always, kept outside the leads in the Short Reach Lay-by. As in all runs there was a passing manoeuvre at this location, it is understandable that the helmsmen should leave plenty of room between the ships, but on the last run at low water, the outbound boat appeared to be outside the leads and close to the western bank of the channel. This is confirmed by the ECDIS plot shown in Figure 6.

Figure 5: Yachts Moored near Cocked Hat

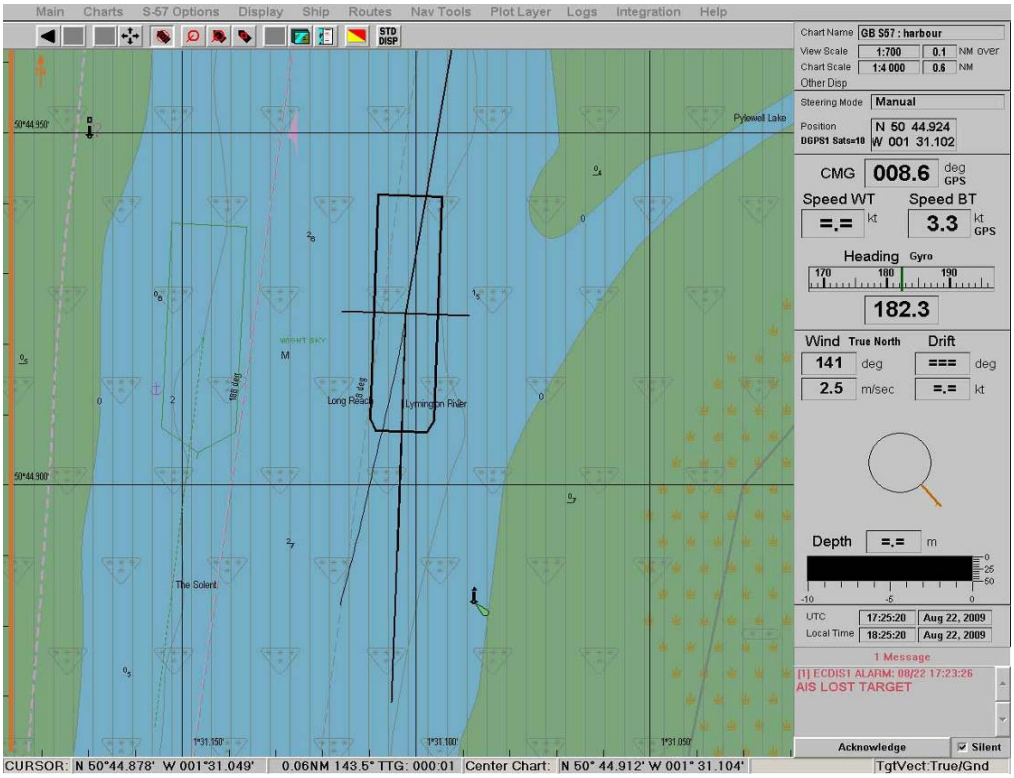

Figure 6: ECDIS Plot Showing Passing at 18:25:30. Ships not on Leads

2.2 Operations on the River

General

Operations on the river were observed and categorised as follows:

- Adherence to the ColRegs;
- Wash and thruster wake effects;
- Low water passage and queuing;
- User behaviour when ferries berth at Lymington;
- Small boats and lifejackets;
- Overall behaviour on the river.

Adherence to the Collision Regulations

Adherence to the Collision Regulations (ColRegs) by the ferries was generally good; they kept to what are now their well-known tracks, keeping to the starboard side of centre on the reaches and tending to take the inside line at the bends.

Most leisure users seemed to be able to live with this, albeit with some indiscipline when there were no ferries ahead (see Figure 7)….

Figure 7: Colreg indiscipline in Long Reach (from ferry)

….but this was much improved when it was clear that a ferry was around. (See Figure 8)

Figure 8: Colreg discipline in Long Reach

Although there was some indiscipline, in general the ColRegs were well observed by the majority of leisure users on the river that day.

Wash and Thruster Wake Effects

Wash from the ferries was minimal, but some small craft were observed giving rise to what seemed to be excessive wash (Figure 9)

Figure 9: Small Boat Wash

Some yachts were seen manoeuvring in the vortex shear plane areas at the edges of the "thruster wake" astern of the ferry and, although some movement off course was noted, their helmsmen appeared to be able to maintain control and course without any trouble.

Low Water Passage and Queuing

The Wight Light was inbound near to low water in the evening and, as has been noted above, adopted the prudent course of using a low transit speed in the river. A consequence of this is that inbound leisure users found themselves in a queue astern of the ferry as it moved up river (Figure 10).

As already mentioned, manoeuvring in the ferry wake astern requires a foreknowledge of the type of hydrodynamic activity going on underwater which will affect a leisure craft. This seemed to be well-understood by the users and there was no evidence of any untoward or unplanned sheers or turns made by leisure craft as a result.

User Behaviour when Ferries Berth at Lymington

A consequence of the queuing astern of an inbound ferry discussed above is an understandable frustration on the part of the users by the time the ferry reaches the Lymington Terminal. The result of this is often demonstrated by the "queue" passing the ferry while it is in the process of berthing, passing taking place in the limited water space between the ferry stern and nearby moored boats.

Figure 11 shows this and illustrates the consequence.

Figure 10: Queue astern of Ferry during Low Water Passage

Figure 11: Leisure Craft passing the Ferry Stern while it is Berthing

As the ferry manoeuvres into the linkspan, it must use its aft thruster to control the stern (and in a strong easterly wind hold the stern against the wind) until lines are ashore. While this is occurring, significant thruster wash can be generated in the limited water space used by the passing leisure craft. This is seen in Figure 11. A possible consequence is that the wash, if not countered in time, could move the passing boat towards the moored boats nearby. This was observed on several occasions.

Small Boats and Lifejackets

On a number of occasions, people in small tenders or other boats have been observed on the river without lifejackets. An example is shown in Figure 12 which was noted during the low water passage discussed above. The consequence of falling overboard from such a boat is clear.

Overall Behaviour on the River

In general, behaviour on the river was good, a view which has been confirmed by other observations made earlier in the summer. Local users seem to be adapting well to the presence of the new ferries and adherence to the Collision Regulations by both local users and the ferries appears to be satisfactory. The additional Harbour Master patrols on the river are welcomed by the ferry masters and seem to be having the desired effect on user safety discipline.

Figure 12: Small Boat Occupants without Lifejackets.

Ian W Dand
26 August 2009