



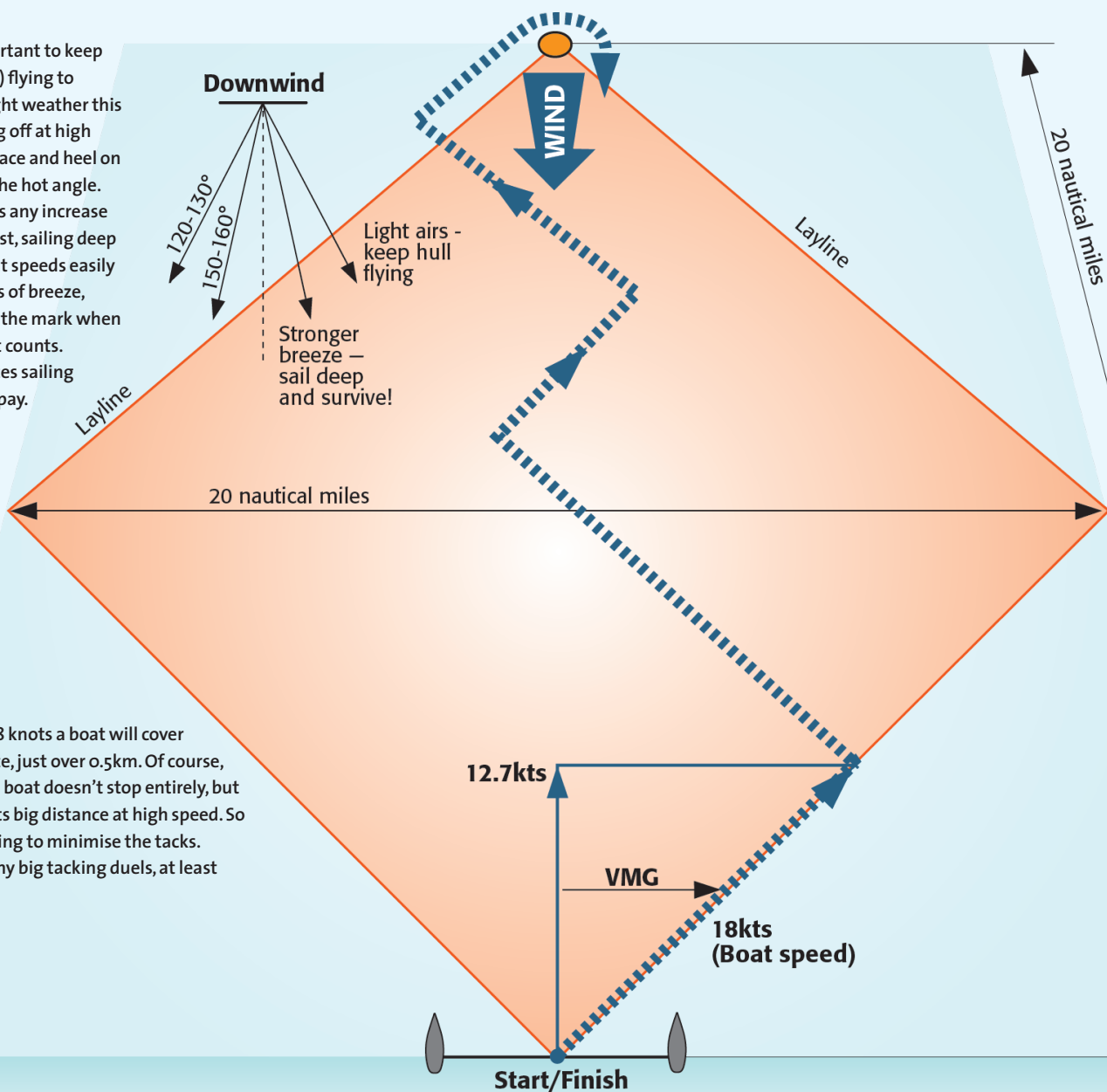
Race 1 (and 3 if required) - windward/leeward

This is a much bigger course than we're used to for the America's Cup and if the boats choose to split tacks, they could be 20nm apart mid-way up the beat. At that point they might not even see each other!

Downwind it's important to keep the windward hull(s) flying to minimise drag. In light weather this could mean spearing off at high angles to keep the pace and heel on – 120-130° could be the hot angle.

As soon as there's any increase in the breeze or a gust, sailing deep will be key. With boat speeds easily in the 20s in 10 knots of breeze, pointing the bow at the mark when you can will be what counts.

In stronger breezes sailing deep (150-160°) will pay.



Cost of a tack. At 18 knots a boat will cover 555m in one minute, just over 0.5km. Of course, through the tack a boat doesn't stop entirely, but slowing down costs big distance at high speed. So teams will be looking to minimise the tacks.

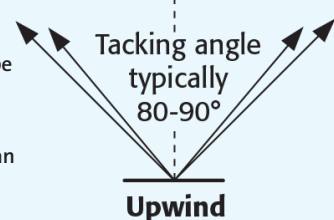
Don't expect any big tacking duels, at least not in this race.

The pre-start. It's unlikely that there will be a head-to-head dial-up. Multihulls are not known for their manoeuvrability and the risk of stalling out and getting into irons could make them a sitting duck for their opponent.

Even at a modest entry speed of 15 knots, the closing speed would be 30 knots into the start box and entering at 20 knots is easily possible. Judging distances and turning circles with a pair of superyacht-sized multihulls when they've only just met for the first time will surely mean that close calls will be avoided where possible.

The big bear-away. The most precarious part of the course, bearing away round the weather mark is the bit all multihull sailors fear, especially when the breeze is up.

In light airs this is unlikely to be a big issue unless there is an awkward sea state. In more breeze, helmsmen and trimmers will try to slow the boat down on the approach to the mark and bear away quickly to stop the boat from building speed and apparent wind. Once deep and safe, the bows will start to come up and the speed will build quickly.



Tacking angles. No one outside the teams knows the tacking angles of these boats, but it is likely to be in the region of 80-90°. But BMW Oracle's wing could prove to be far more close-winded. If she can also match Alinghi's pace through the water, the trimaran will have a significant advantage.

How long might it take to get around the course? (not allowing for tacks or gybes)

Upwind leg

Boat speed (kts)	Tacking angle (degrees)	VMG (kts)	Time to WM (min)
16	80	12.3	98
16	90	11.3	106
18	80	13.8	87
18	90	12.7	94

Downwind leg

Boat speed (kts)	True wind angle (degrees)	VMG (kts)	Time to LM (min)
16	120	8.0	150
16	140	12.3	98
18	130	11.6	104
18	140	13.8	87
20	130	12.9	93
20	150	17.3	69
24	140	18.4	65
24	160	22.6	53

Approx total race time – 2.5 to 4 hours

A split-tack start and total belief in their chosen side of the course could see the pair separated by 20nm halfway up the beat. Will either hold their nerve? There's an argument that says they might.

Tacking a multihull costs time – maybe a minute or so to get back to full speed. When your opponent is doing 15-18 knots, that's a good deal of distance. But splitting from an opponent would be a bold call, especially as the 20nm beat should provide enough time to claw back the distance lost through the tack.

Another risk of splitting from your opponent to this degree will be the risk of sailing in completely different conditions. But if you're clearly trailing and down on pace, why not?

Manoeuvrability. Will BMW Oracle's trimaran and wingmast turn out to provide a more manoeuvrable boat than Alinghi's cat? If it does – and there was evidence that it might – the American team could be looking to plant a penalty on the Swiss during the pre-start.

Performing a penalty turn with a monster multihull will not be a quick operation and in a breeze it could be pretty risky. The teams will have practiced this, but neither will want to have to do it for real.

Race 2 – triangular

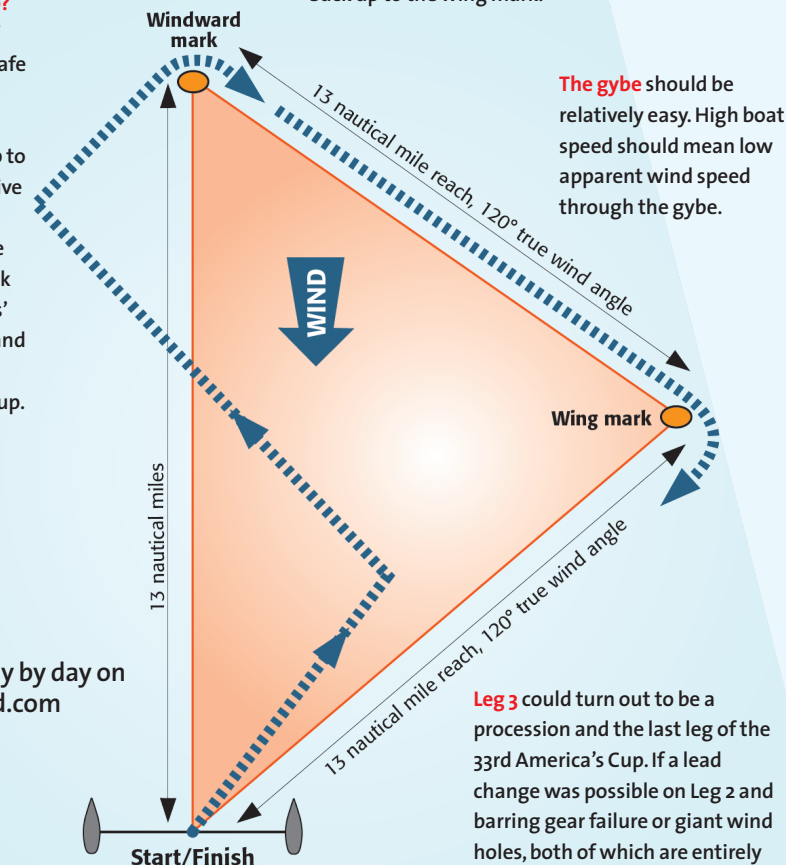
A beat then a reaching blast around a triangular course. Assuming there are no breakages – and this is by no means a given – this race is all about the first beat.

The bear-away of the Cup?

With a true wind angle of 120° on the next leg, the safe option would be a quick, deep bear away before bringing the boat back up to 120° true. But this could give away precious distance.

Bearing away onto the heading for the wing mark could see the competitors' boat speed build rapidly and risk burying the bows, especially if the breeze is up.

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Weather mark. Once round the weather mark, the next two legs could be a procession, albeit a high-speed one. A crucial decision is the choice of sail for this leg. The true wind angle may be set at 120°, but the strength of the breeze will dictate boat speed and hence the apparent wind angles.

Being forced to sail deep if the boat is overpowered or a gust has suddenly rolled in could prove disastrous if the boat can't climb back up to the wing mark.

The gybe should be relatively easy. High boat speed should mean low apparent wind speed through the gybe.

Leg 3 could turn out to be a procession and the last leg of the 33rd America's Cup. If a lead change was possible on Leg 2 and barring gear failure or giant wind holes, both of which are entirely possible, there's a good chance that the leader at the wing mark will go on to win the race.

UPWIND WW mark distance 13nm			
Boat speed kts	Tack/gybe angle degrees	VMG kts	Time to mark mins
16	80	12.3	64
16	90	11.3	69
18	80	13.8	57
18	90	12.7	61
19	80	14.6	54
19	90	13.4	58
20	80	15.3	51
20	90	14.1	55

DOWNWIND Wing mark distance 13nm			
Boat speed kts	Time to mark mins	2 x Leg time mins	
16	49	98	
18	43	87	
20	39	78	
22	35	71	
24	33	65	
30	26	52	

Approx race time 2.0 to 2.5 hours

Each leg is 13nm, making this beat shorter than the windward/leeward course. As a result, the time spent through a tack will count for more in proportion to the length of the leg – ie tacking will cost more.

But if one boat has discovered she's more nimble through the tacks than the other, she may decide to try to instigate a tacking duel.

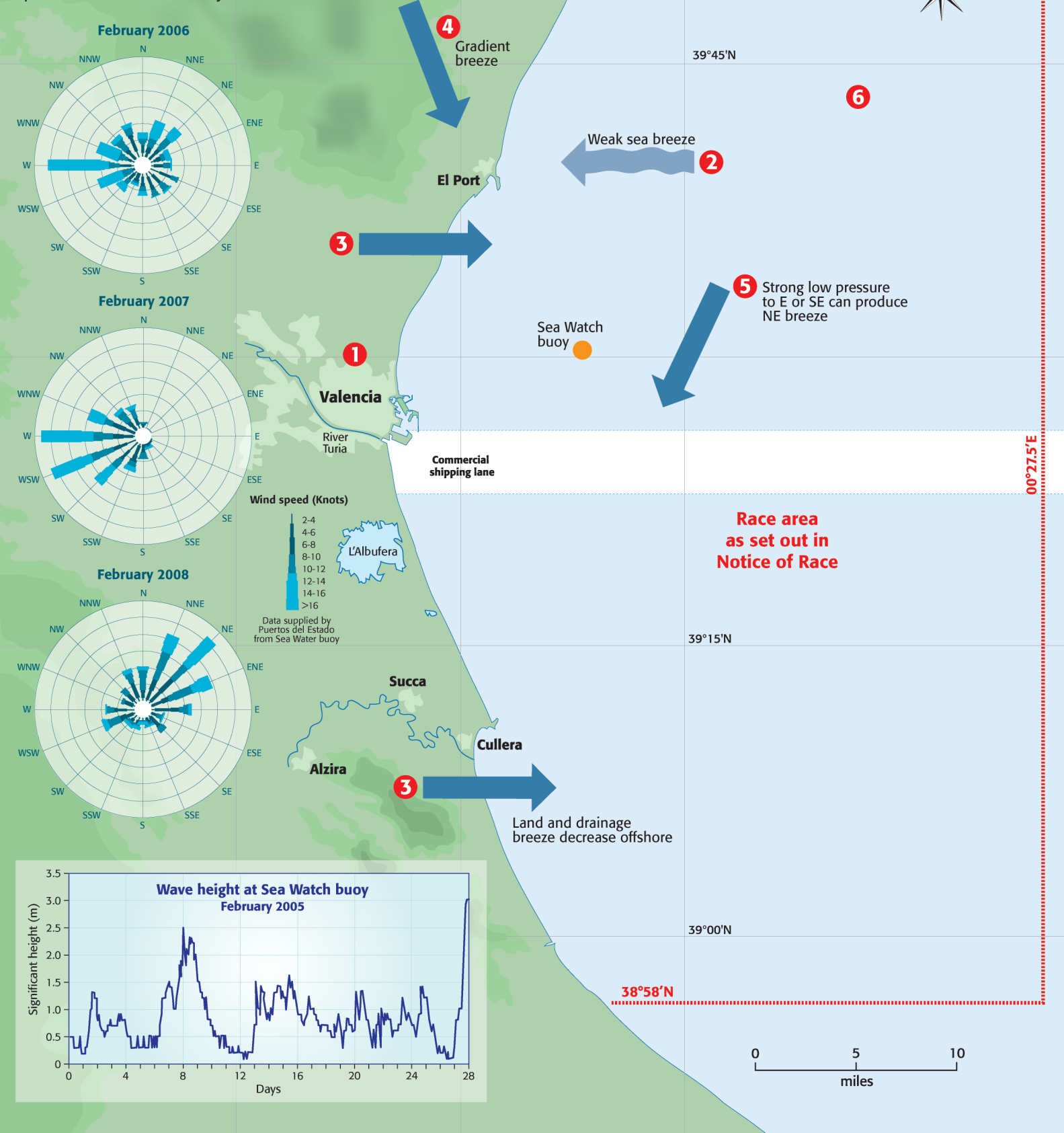
This beat is crucial, getting to the weather mark first will pay dividends.

Estimated leg times could range from 50min to 30min or less depending on just how fast these boats travel. At 30 knots, each leg could be just 26 minutes.



HISTORICAL WIND DATA

These radar plots give a good idea of the variety of wind directions and strengths that can be experienced in Valencia in February



Conditions in Valencia

Valencia in winter is very different from in summer. During the 32nd America's Cup conditions were largely driven by the regular sea breeze developing off the Spanish coastline. Even then, the weather threw a spanner in the works from time to time, not least during Round Robin 1 of the Louis Vuitton Challenger series when five days were lost.

In the winter, with short daylight hours and a low sun, the opportunity for the land to heat sufficiently to create a meaningful sea breeze is limited. Add to this the need to achieve steady conditions over a 20 x 20 nautical mile area for two to four hours and a maximum of seven and it's clear that the weather will play a big part in this event.

Here's weather expert Chris Bedford's assessment of the likely conditions:

1 A February series will be held in the cool months of winter. Average daytime maximum temperatures are around 16°C while average minimums are near 5°C.

2 The thermal sea breeze conditions are typically poor in February. While it is not impossible for sea breezes to occur, these tend to be very weak and poorly formed. The sea surface temperature is near its seasonal minimum (around 7°C) and the thermal input from the sun, while improving, is still weak given the time of year. Any sea breezes are late in forming and don't typically extend very far offshore.

3 Balancing the weaker sea breezes, there can be stronger and well formed overnight and morning land breezes and drainage winds. These winds form when overnight cool airs from the land flow out toward relatively warm areas over the Gulf of Valencia – essentially the reverse of a sea breeze. Unfortunately, these breezes blow during the darkness of early morning and may last only a couple hours into daylight. In addition, land breeze and drainage winds decrease with distance from shore.

4 In February, best chances for more consistent winds may come from larger scale weather systems moving around

Western Europe and the western Mediterranean. While February can be an active month, with both low and high pressure areas tending to be stronger than in summer, the time between them may be lengthy, giving two or three days of wind followed by extended periods of lighter breezes. When strong low pressures pass to the north of Spain and push cold fronts across the country, one or two days of stronger west and north-west winds can develop. Normally, these offshore wind events arrive with relatively flat sea conditions.

5 Sometimes strong low pressure will form over the western Mediterranean east or south-east of the Gulf of Valencia. These systems are sometimes responsible for fresh or even strong north-east winds that can last for a couple days or more. These weather patterns often bring unsettled weather to the region with rain and squalls.

In addition, these weather systems bring the roughest seas to Valencia. Thanks to a relatively long fetch from the north-east, rough swells of 2m, 3m and sometimes more can develop.

6 The famous Mistral winds do not normally directly impact Valencia. In fact, even with 40+ knots of Mistral blowing in the Gulf of Lyon down to Palma, some 130 miles to the east, the Gulf of Valencia can be in a shadow of little breeze or even a slight south-east/south return flow. The exception is a branch of the Mistral which sometimes flows out the River Ebre delta, about halfway between Valencia and Barcelona. A river of strong, cold, north-west wind can turn down the coast and flow across the Gulf – strongest in the morning, but also lasting into the afternoon. Mistral winds produce significant waves over the Gulf of Lyon down to north Palma and these seas propagate into the Gulf as a rough swell.

A Deed of Gift course

This America's Cup could not be more different from the last multi-Challenger, four-month event. Just two teams, the Defender and Challenger, will go head to head in a best-of-three series that could be over in one week. Some believe the winner will be obvious a few minutes after the boats cross the first start line. Others aren't quite so sure and suggest that the pair of monster multihulls are far closer in performance than the 60ft cat versus the 120ft monohull of 1988.

The event will comprise three races, two windward/leeward courses of a single beat and run each and a triangular course with a beat and two reaches. The courses will be much bigger than we've been used to. Last time the windward/leeward course had legs of two or three nautical miles and three laps. This time the beat and the run are 20 nautical miles apiece. If the boats choose to split tacks and bang each corner, they could be 20nm apart mid-way up the beat. From that distance they won't even be able to see each other, let alone figure out who's lifted and who's knocked.

Why the change in the course? So long as they can agree, the Deed of Gift makes provision for the Defender and Challenger to organise just about any kind of racing they like within certain limits. But if there is no mutual agreement then the DoG provides the default, stating: 'In case the parties cannot mutually agree upon the terms of a Match, then three races shall be sailed, and the winner of two of such races shall be entitled to the Cup.'

It goes on to specify the length and type of race and the requirement for a layday between each race.

THE 33RD CUP IN A NUTSHELL

RACES

Best of three race series

- Day 1 – windward/leeward, one upwind, one downwind leg, each 20nm

- Layday

- Day 2 – equilateral triangular race 39 nautical miles, one beat, two reaches

- Layday

- Day 3 – windward/leeward, one upwind, one downwind leg, each 20nm

Race time limit – 7 hours

DATES

8, 10, 12 Feb 2010

These are the first available dates that the races can be held. If conditions are unsuitable, races will be delayed until more satisfactory conditions prevail.

LOCATION

Valencia

Site of 32nd America's Cup

Team bases are in Darsena

See www.yachtingworld.com for details of when and how you can follow the racing.