

# VPRS performance based yacht rating – developed for club racing

## A modern calculator: ratings from a VPP (velocity prediction program)

VPRS (velocity prediction rating system) uses a VPP and a set of measurements to predict the sailing performance of a yacht, from which the rating is directly calculated. The measurements are used to determine the resistance to motion presented by the hull, and the drive (and drag) generated by the sails. A rating calculation for a yacht uses the VPP many times to produce a matrix of predicted speeds for several wind strengths and points of sail. A weighted average is then taken, biased towards upwind performance to reflect a typical windward/leeward course. Finally, this is scaled to give the rating, expressed as a 4-digit TCC (time correction coefficient) and used in the normal way.

VPRS does not conflate rating with race management, as is apparent with some other rating systems. This is evident from the no-spinnaker TCCs. Typically 8% lower, they reflect the true loss in averaged sailing performance expected on the water and are intended for strict no-spinnaker classes. Ratings suitable for mixed-class racing are also provided if required.

When evaluating a rating system remember that close racing results are the goal of handicap systems (these include rating systems which apply corrections—overtly or otherwise). This is not the case for pure rating systems, like VPRS, which 'remove the boat from the race' in order to yield results reflecting crew performance and tactical decisions. The distinction is clearly illustrated by one-design class events—where the racing is frequently seen to be anything but close.

## Yacht Clubs currently racing with VPRS (first available spring 2011)

Parkstone Yacht Club  
The Royal Motor Yacht Club (Sandbanks)  
Poole Yacht Club  
PYRA (Poole Yacht Racing Association)

... and recent interest from clubs in Lymington, Weymouth, Torbay and Plymouth.

## Some real advantages ...

- ◆ Ratings are direct predictions of boat performance—they depend entirely on measurement.
- ◆ A wide range of sailing craft can be rated; a J133 (Jeronimo), a custom gaff cutter (Foxhound) and a sports boat (Seascope 18) all have certificates ... see <http://vprs.org/ratings.html>
- ◆ All boats are individually assessed; departures from class norms are accounted for—and significant changes made during a manufacturing run can be captured.
- ◆ Performance gains from laminated and low cut sails, as well as losses from more cruising orientated sails and furling gear, are reflected in the ratings—and any combination of these is possible.
- ◆ A VPP (giving a scientific assessment of performance) is used together with a straightforward set of clearly defined measurements. This makes the measurements easier to understand and the system more accessible.
- ◆ The certificates include the rating data and are freely published on the website; the measurements for any boat held on the system can be checked by anyone.
- ◆ No local adjustments are made to any of the calculated ratings, so they are universally applicable.
- ◆ A modern sophisticated system costing just £20 for any boat—is accessible to everyone.

## **Using VPRS – for more information and to apply see [www.vprs.org](http://www.vprs.org)**

The measurement guide lists and illustrates the measurements required; these are similar to those needed for IRC. Ratings can normally be calculated without some of the measurements as they can often be found on the web, or taken from sister ships—and good estimates can usually be generated. The measurement forms can be downloaded and returned via email or by post.

Two free trial ratings are available each year to allow the impact of any proposed changes on the rating to be seen, and then implemented if required.

### **Development, refinement and feedback**

With VPRS now being used to score races, plenty of feedback is being received. New ideas are always welcome and if they're widely beneficial and pragmatic then we'll try to include them for the next season. The primary system aim is to take proper account of differences in equipment to give a fair rating and equitable racing—for any racing budget.

Sports boats (keel boats up to 850kg) were first tried in the system this year (a Seascope 18 is listed) and feedback suggests that it is reasonably rated. More extreme sports boats, such as the Viper 640 (only 350 kg) needed extensions to the model; these were completed in May. The relative ratings for sports boats now compare very favourably with those given by SMS (Sports boat Measurement System).

2012 will see some minor changes to the measurement data, with perhaps some additional items for the sports boats. In addition, some new diagrams will help to more closely distinguish between keel types.

### **Origins**

VPRS was developed in response to an invitation by PYRA to address the wide dissatisfaction with the existing rating systems being used in Poole harbour, principally IRC and PHHS. The main problems were that IRC was too expensive for many, whilst others considered PHHS to be flawed. This resulted in the use of two rating systems for PYRA races, which reduced class sizes and made the racing less competitive—and less attractive. Comparisons across the split fleet were impossible, the scoring was onerous, and the fleet was reducing in size.

VPRS evolved from a private research project which started in 2007. The aim was to take a scientific approach to the problem of predicting yacht performance whilst using a limited set of measurements. The results were verified against speed-polar data which had been logged for a variety of conditions whilst racing. Originally designed to model a single yacht, the development was extended and made more generic to give predictions for other yachts. Subsequent testing then showed that it accurately modelled a diverse range of craft, and a comparison with IRC ratings revealed a good correlation.

In 2009 PYRA became interested and sponsored further development. This was undertaken in close conjunction with the Poole racing community, and a trial was successfully conducted during 2010. This resulted in a large majority voting at the PYRA AGM to adopt VPRS for the entire fleet, replacing both IRC and PHHS. The change allowed the class structures for 2011 to be simplified—and with fewer classes came the prospect of much more competitive racing.

### **The future**

VPRS has advanced considerably over the last year and recent positive feedback indicates that it is no longer necessary to benchmark it against other rating systems. An entirely independent design by engineers with racing experience, it provides a fair and accurate system that is widely accessible.

As a result, there is greater interest and wider adoption is anticipated in 2012. With more people using the system, there will be further opportunities to simplify class structures and make club racing more competitive and inclusive—as is already happening in Poole.