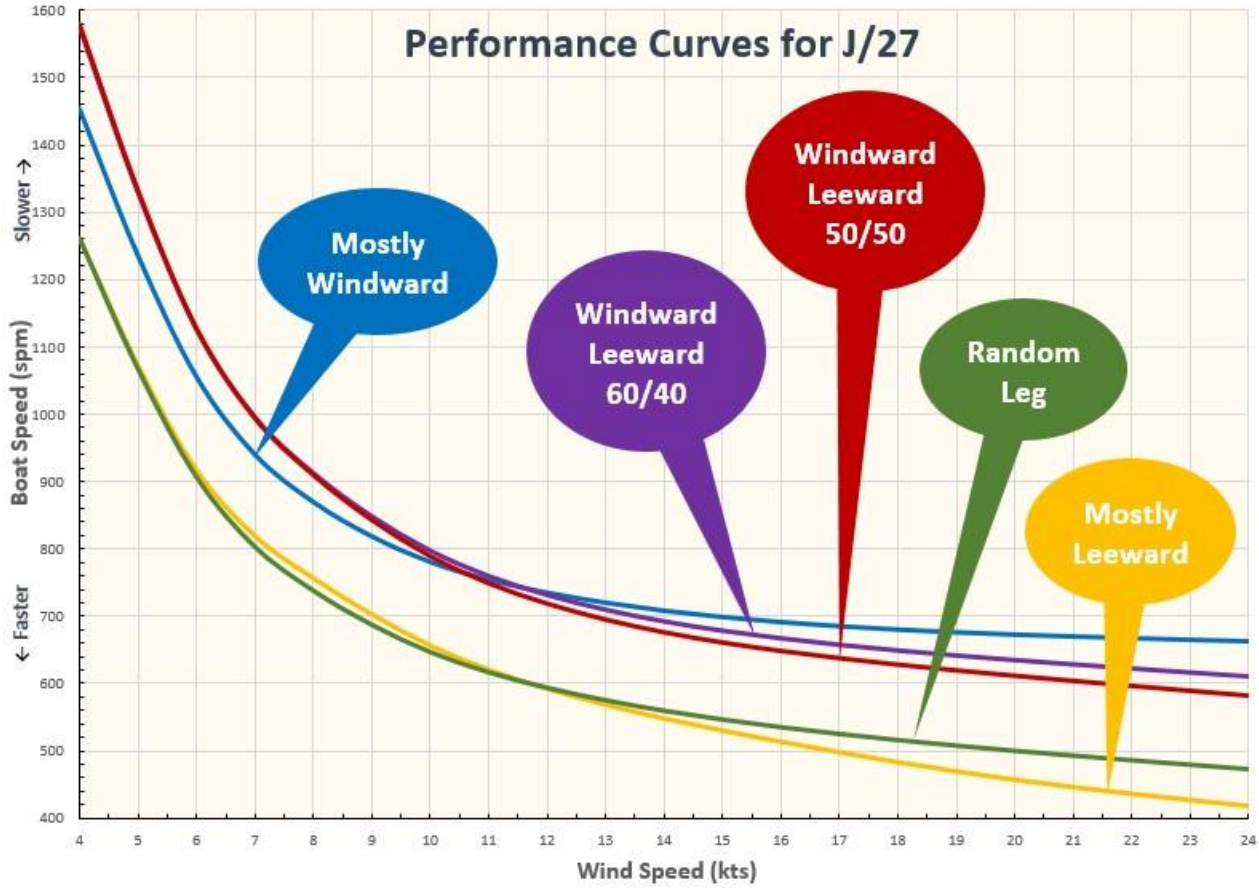
What is a Performance Curve?

The performance of a boat on any given course can be defined by its boat speed as a function of the associated wind speed. The more wind there is, the faster the boat will sail. This performance can be plotted on a simple graph which creates a curve. In the diagram below, Boat Speed is plotted as seconds per nautical mile (spm) versus Wind Speed in knots.

The shape and position of the performance curve is further dependent on the blend of wind angles which make up the race course. Consider that a boat performs very differently on a reaching leg than on a beat or a run. The curves on the diagram below are all for the same boat, but represent five different race courses, each with a different blend of wind angles.



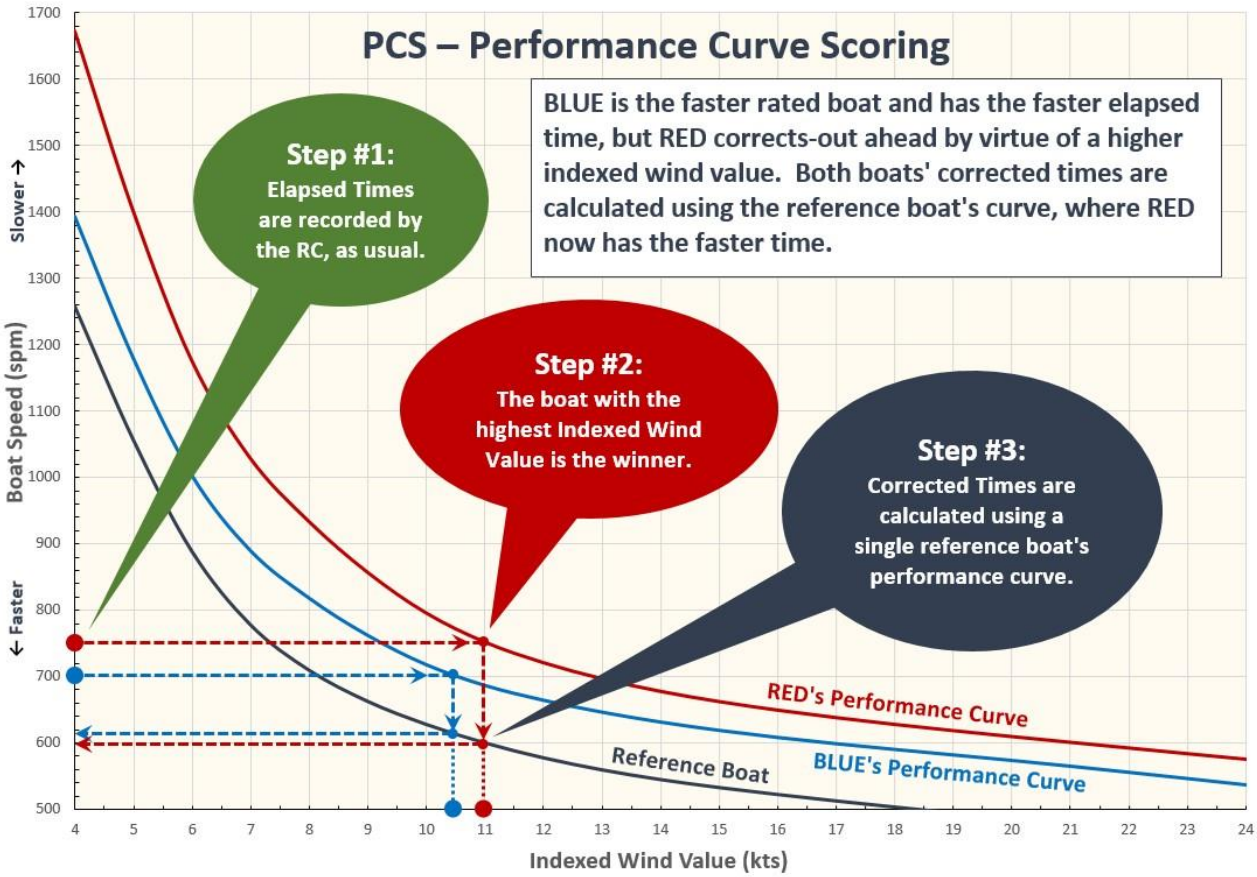
The output of the ORR-Ez Velocity Prediction Program (VPP) includes over a hundred data points which are used to define the predicted performance curves of the boat being rated. This data can be distilled down to a few generalized rating points, as in Standard Time-on-Distance (TOD) or Time-on-Time (TOT) scoring, or it can be used in its entirety for Performance Curve Scoring (PCS).

What is PCS?

Performance Curve Scoring (PCS) is the highest evolution of VPP-based scoring. PCS is unlike other scoring systems in that it is not limited to a fixed rating value averaged across a range of wind speeds. Instead, PCS accesses all of the VPP-produced performance data from each boat's unique performance curve, as illustrated below.

In the process shown below, each boat's unique performance curve is used to translate her **Elapsed Time** for a given race course – expressed as **Boat Speed** – into an *Indexed Wind* value. The boat with the highest **Indexed Wind** has sailed the course with the greatest efficiency and is declared the race winner. The remainder of the fleet is then ranked using the same process.

The Indexed Wind values can be translated into **Corrected Times** using the performance curve of a single Reference Boat. This creates more familiar race results.



A key feature of PCS is that the Race Committee does *not* need to determine the wind speed across the racecourse in order to score the race. The RC only needs to record the race distance and select the appropriate race course type.

PCS is also notably easy for competitors to estimate on the water. The PCS Ratings tables can be compared between boats on a simple time-and-distance basis, very much like PHRF.