Date: **19 March 2024**

From: **Brad Wheeler, Chair TPYC Technical Committee**

Subject: **Handicap system comparison for 2025 Transpacific Yacht Race**

In January 2024, The Technical Committee completed its review and recommendation on the F-TCF, or Forecast-Time Correction Factor. The committee recommendation was to move forward with F-TCF, and this is now for discussion and voting at the full board. Some more information on F-TCF has become available:

- The Newport Bermuda race has an article on how the F-TCF will work for the 2024 race: https://bermudarace.com/competitors-bulletin-4-broc-adopts-new-scoring-model-for-2024-race/
- ORC has announced their version of F-TCF (Weather Routing Scoring: *https://orc.org/sailors/news-archive/orc-weather-routing-scoring)* which uses for-pay PredictWind routing service for their scoring service (note: TP is planning to use *NOAA GFS and HRRR* publicly available GRIB files, and *Expedition Navigation Software* as the routing software)

The TPYC bridge has decided it is important to include a review of the VPP component of the handicap system as part of this periodic review of Transpac's handicap system. The next project for the Technical Committee was to review the key VPP rating rules to ensure TP maintains the best and fairest rating system for our TP race.

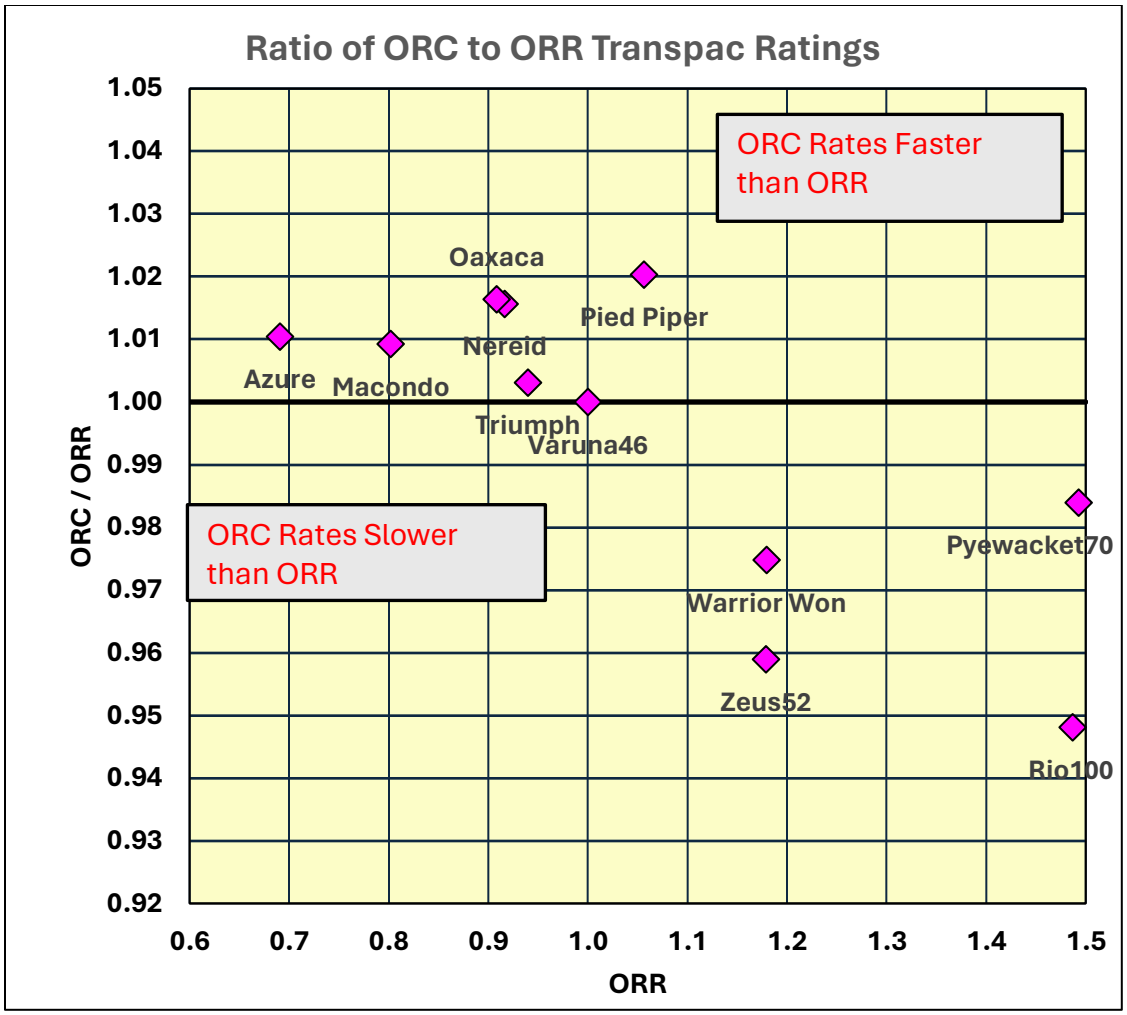
Specifically, the Technical Committee was tasked to look at our current rating rule, ORR and compare it to the ORCi rating rule. The focus was specifically on the rule and how it impacts our race and our community of boats on the west coast, and not focus on any operational or business issues (those may be reviewed by others as required). There is a consensus among the Technical Committee that the appropriate measurement of various rule systems is that which can be defined to be the fairest. We looked to see if either rule provided unfair advantages for certain sizes or shapes or types of boats. Our plan was to provide a selection of 10 varying boats from the older displacement, to high-speed planing boats, conventional fixed keel and single rudder as well as dual rudder, canting keel and lifting foils and up to 100 ft maxis. We ended up with 11 boats (Azure Cal40, Macondo, Ben47.7, Neried J125, Oaxaca SC50, Triumph SC52+, Varuna Rogers46, WarriorWon Pac52, Zeus DSS52, Pyewacket Volvo70+, and Rio 100 Ft). We were to use the latest version of the rating systems available for both rules (2024 for both) and were to identify rating anomalies of each rule and to standardize our boats configurations to make the fairest apples-to-apples test while maintaining the likely configurations boats would race to Hawaii with.

Over the past few weeks/months, we have worked with Jim Teeters, US Sailing's Head of Offshore Ratings Office, and Chris Tutmark, Head Measurer, with support of Greg Stewart and

Alan Andrews, to make the various input elements as similar as possible so that the output is as valid as possible. Key areas that we focused on are:

- Verifying that ORC had updated their rule to include up to 24 kts TWS (previously they stopped at 20kts which was a key concern for TP racing). It has been updated to include a 24 kt wind band.
- Obtain spinnaker and flying headsail dimensions for test fleet boats with asymmetric spinnakers and flying headsails smaller or narrower than the largest of each type recorded on the ORR certificate. ORC requires dimensions of each spinnaker with mid width less than 85% of foot and each headsail set flying where ORR requires the dimensions of only the largest of each type of sail.
- Whisker Poles and Outriggers: Some of our TP boats used various mixes of whisker poles off the mast and/or outriggers off the aft hull, however ORC only allows whisker poles attached to the mast. For PiedPiper, we reran both rating rules with no whisker pole (running a 155% genoa with a mast mounted whisker pole makes no sense).
- Crew Weight: TP/ORR and ORC have differing rules for default and allowed crew weights. ORR's Base Crew Weight is a function of Length, Displacement, Righting Moment and Beam. ORCi's default crew weight is a function of length only. We decided 85% of ORC default crew weight was the best match using an ORC formula to Transpac crew weight and used that for the ORC Test certificates.
- Identify if the Pacific Swell Factor was a significant factor. It displayed a minimal impact and not enough to sway the analysis. Note: Pacific Swell Factor is a ORA IP and likely not be allowed to be used with ORC.
- Ensuring Pyewacket70 had the correct selection of water ballast, canting keels and sails to ensure apples to apples comparison. No significant impacts to earlier analyses were found.
- ORR Transpac ratings are printed on the certificate and calculated from the Transpac Wind Matrix and the VPP predicted speeds. For ORC, the same wind matrix and the speeds from the Test Certificates were fed by the rating office into a spreadsheet which duplicates the calculations used for ORR to produce the Transpac ratings. The same scratch boat, the Rogers 46 Varuna, was used for both ORR and ORC.

The outcome of the analysis is that ORC provides a decided 'shift' towards bigger/faster boats compared to ORR. Specifically, the faster boats (WarriorWon, Zeus52, Pyewacket 70, and Rio100) were rated 2.5% to 5.2% 'slower' in ORC versus ORR, while the majority of the rest of the fleet was relatively close for both rating systems. This is a net effect of 'tilting' the rating advantage towards the larger boats, at the expense of the smaller boats. This had been seen before in Transpac history, which caused us to start to lose small boats, which shrank the fleet, and then the larger boats shrank as well. <u>All comments returned by the committee were in agreement that we must not move towards an uneven rating status.</u>



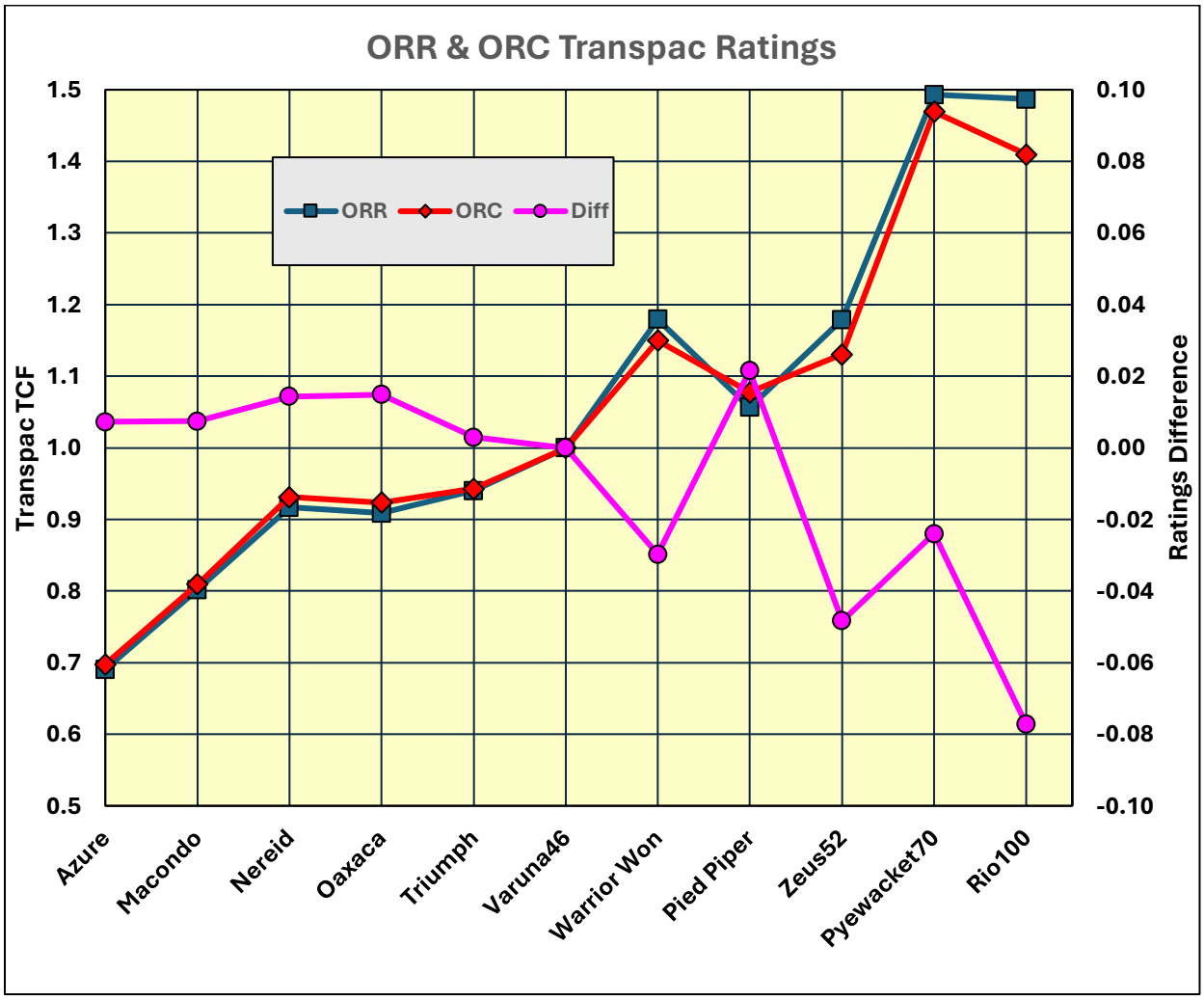
Alan provided a very specific corrected time calculations which showed the larger/faster boats got a decided advantage under ORC:

Sleds vs. Pac 52 - Compared to ORR, the ORC rating of the ULDB 70 Pied Piper is 2% faster and the ORC rating of the Pac 52 Warrior Won is 2.5% slower for a net change between the two boats of about 4.5%. If Pied Piper sailed the course in 8 days (192 hrs.) then rated in ORR, Warrior Won would have to sail the course in 171.9 hours to tie. If rated under ORC, Warrior Won would tie if they sailed the course in 180.0 hours. Or, ***an 8.1 hour rating advantage under ORC.***

Small or slower boats to large – The two slower and heavier boats, the Cal 40 and Beneteau 47.7, are rated about 1% faster in ORC than in ORR. The fastest two boats, Zeus52 and Rio100 rate 4-5% slower in ORC than ORR. The net difference would show the Cal 40 and Bene47.7 rating about 5-6% faster than the bigger, faster boats under ORC than ORR. If the Cal 40 has a 13 day (312 hr.) elapsed time, under ORR Rio100 would tie with an elapsed time of 144.9 hours

*but under ORC they would tie at 154.5 hours, or **almost 10 hours slower.** Comparing the Cal 40 in 13 days to the Pac 52, **the Pac 52 can finish 6.7 hours later under ORC than ORR to tie.***

The actual rating 'tilt' can be easily seen in the following graph, where the small and mid-size boats ratings are pretty close between the two rules, but the four faster boats see a considerable rated speed 'decrease':



Key comments received from various TP Technical Committee members are:

- "It makes a better race if smaller boats are really in the hunt"
- "there is no compelling reason to change away from ORR for TP2025"
- "F-TCF makes a much more impactful change for TP2025"
- "...let's not let a substantial tilt favoring big boats creep in again... Let's stick to ORR!"

So, with all the analysis and detailed work by Greg, Alan, Jim and Chris, **the recommendation by**

the Technical Committee is to stay with ORR for TP2025. The biggest driver for this recommendation is the decided 'tilt' towards larger boats, which would negatively impact the results of smaller boats, and thereafter impact the size and makeup of the TP fleet going forward.

TPYC Technical Committee Members:

Brad Wheeler, Chair
Dan Nowlan
Bill Lee
Keith Kilpatrick
Piet Van Os
Stan Honey
Greg Stewart
Alan Andrews
Eric Berzins