



WORLD BRIDGE FEDERATION

International Sport Federation (IF) recognized by the International Olympic Committee

RATIONALE FOR THE NEW WBF VICTORY POINT SCALES

In 2012 a WBF committee headed by Ernesto D’Orsi (Brazil) and including Max Bavin (England), Henry Bethe (U.S.), Bart Bramley (U.S.), Peter Buchen (Australia) and Maurizio Di Sacco (Italy) created new Victory Point (VP) scales for the WBF. Bethe and Bramley had worked on a similar project for the USBF about ten years earlier, which resulted in the VP scales used by the USBF for their team trials. The WBF committee drew heavily on this earlier work, but also considered each part of the problem afresh.

TECHNICAL CRITERIA

Two technical criteria were paramount:

1. Make every imp count. The long-time WBF scales used a “step-wise” system in which someimps were worth a full VP (the “step”), but most were worth nothing. Smoothing out these “cusps” was desirable.

2. Create a sliding scale. That is, make more distant (further from zero)imps worth no more than closer (to zero)imps. The old scales included this feature at their tail ends, where VPs first became slightly harder to earn for the winning team, and then became impossible for the winning team while the losing team could continue to lose VPs. However, most of the scale was flat, with VPs accruing at a uniform rate, except near zero, where, paradoxically, the FIRST VP was harder to earn than most later VPs. The committee decided that theimps closest to zero should be worth more, because thoseimps determined who won the match. Accordingly, they should be more valuable than theimps for “piling on”.

The committee was in strong agreement on both points. #1 also has the acceptance of most of the bridge-playing community. However, #2 has been the subject of debate. Some argue that round-robin (RR) contests, which are one of the primary venues for VP scales, should not be considered individual matches but as one long match against multiple opponents. We disagree. In any reasonably structured contest, the immediate objective is to defeat the opponent at hand. VP scales should recognize this objective. Indeed, a “VP scale” that treats allimps equally is not a “VP scale” at all; it’s just a restated sum of the imp margins.

(Note that the imp scale itself is a “VP” scale, translating total point swings on a SLIDING SCALE that assigns the most weight to those swings closest to zero.)

(Also note that the WBF implicitly endorses the virtue of winning individual RR matches by giving carryovers to RR match winners if the two teams meet again later.)





However, the committee did not go overboard on #2. The value of subsequentimps would GRADUALLY decrease. Allimps would be worth ALMOST the same as their “neighbourhood”imps. This structure seemed both technically correct and aesthetically pleasing.

IMPLEMENTATION CRITERIA

All other aspects of the scales are implementation details. Note that any of the following could be changed without affecting the essential nature of the scales. They include:

3. Extent. Should the scales go to “infinity” or stop somewhere? After all, if “every imp counts” we could go on counting forever. We decided that there would be a point of diminishing returns at which furtherimps were worthless, called the “blitz point”. We determined that the desirable “blitz point” should be reached only 5% to 10% of the time, a feat that is “hard” but not “impossible”. Extensive empirical research on RR matches and segments of longer matches (from WBF events, European championships, and NABCs) showed us that this point was a function of the SQUARE ROOT of match length, and was consistently about 15 times the square root of the number of boards played. Happily, for the most common segment length of 16 boards, the blitz point is a nice round 60imps.

4. Uniformity. Should the maximum number of VPs be the same for all match lengths? We decided “yes”. A variable maximum would create confusion.

5. Midpoint. Should the midpoint be zero, with an exact tie worth 0 VPs for each team and other results creating reciprocal plus and minus VPs? (Average would be zero.) Or should the midpoint be positive, so that all VP scores would be non-negative? We decided that negative numbers would be too confusing. The midpoint would be positive.

6. Precision. Should VPs use three digits of precision? Four? An infinite number of digits? Note that common fractions like $1/3$ require an infinite number of places in their decimal representation (.333333...). No. The committee determined that THREE significant digits would suffice to differentiate adequately among the possible imp margins. This would allow 1,000 different VP assignments for a winning team. Most margins would have a unique VP “weight”. A few would have the same weight as their neighbour. Longer segments, with higher blitz points, would necessarily have somewhat fewer unique weights than smaller segments.

This was a compromise between accuracy and feasibility. A fourth significant digit would have allowed unique weights for all outcomes. However, it was not worth the burden of having to cope with much larger VP numbers, no matter how we expressed them. The occasional loss of precision in the least significant digit is a small price to pay for easing the arithmetical requirements for both players and administrators. More importantly, three digits are sufficient for the main task at hand, which is to distinguish the candidate teams from each other. We had no doubt that three-digit precision would make VP ties extremely rare at the end of the competition.

7. Scale size. How should VP scales achieve the desired precision, with large numbers and no decimals, or with smaller numbers and decimals? Here we drew on the USBF experience. When the same question arose many years ago, the USBF committee was divided. Eventually those in favor of decimals won out. Our experience indicates that this was the right decision. While decimals are off-



putting for many people, very large numbers (running into the thousands) are even more off-putting. The clincher was that using decimals would allow us to retain the familiar 20-VP framework that had been in use for many years. (Yes, the old WBF scale was effectively a 20-VP scale. Winners could gain a maximum of exactly 10 extra VPs beyond what they would receive for a tie.)

The scale would run from 0 to 20 VPs, and it would use TWO decimal places. The midpoint (see #5) would be 10 VPs. The 10 extra VPs available to the winner could be divided into 1,000 distinct possibilities, as desired for 3-digit precision. Average VPs per match would be ten, easily enabling competitors to determine their score relative to average after any number of rounds.

8. Scale “shape”. To assign the proper number of VPs to each imp margin, we needed a formula that would “connect the dots”. But first we had to determine “the dots”. Two of them are easy: An exact tie is worth 10.00 for each team, and a blitz is 20.00 to 0.00. The third dot is the VP midpoint, worth 15.00 to the winning team. Both empirical evidence and aesthetic sense showed us that this point was $1/3$ of the way from a tie to a blitz. For example, in a 16-board match (with a 60-imp blitz point), the winners would get 15 VPs for a 20-imp margin, but would need an additional 40imps to get the full 20 VPs. The same $1/3$ to $2/3$ ratio is true for any length match. (Extensive empirical evidence supports the conclusion that about half of all matches result in winning VPs from 10.00 to 15.00, and half result in winning VPs from 15.00 to 20.00. The committee deemed this a highly desirable outcome.)

The scale is not as skewed toward the earlyimps as it might first appear. Observe that (in a 16-board match) moving the 15-VP margin from 20imps to 30imps would produce a completely flat scale.

Given the three “dots”, many formulas exist that will connect them in a smooth curve. All of the curves look roughly the same. We chose the one we used in the original USBF implementation, which is based on the “golden mean”, an ancient Greek mathematical concept renowned for its aesthetic appeal. (For this choice we are indebted to Henry Bethe.) The exact formula is not relevant to the present discussion.

9. Rounding and tweaking. The initial formula produces VPs with effectively infinite precision. We must reduce them to our desired two decimals of precision. The first step is rounding to the nearest .01 VP. After that we examine the scales for “rounding anomalies” which violate the principle of “laterimps are never worth more” and adjust the VPs for certain margins by a maximum of .01 VPs to correct the anomalies. A separate section of the formula handles the “tweaking” of anomalies. Everything is done algorithmically by a computer program. The final result is a scale that meets all of our criteria. (We are indebted to Peter Buchen for programming the formulas, and for his deep understanding of them.)

10. Practical use. How should competitors and directors determine VPs during a real event? Is it by “formula” (relying on a computer) or by “lookup table”? **The committee overwhelmingly endorses lookup tables**, used in the same way that VPs have been determined since they were first introduced. The VP scale for the current match length will be prominently displayed in a public place (preferably several), and ideally will also be in all competitors’ scorecards. (Scorecards should contain the VP scales for all of the most common match lengths.) For each possible margin the exact winning and losing VPs will be listed. Competitors can look up the margin and read their VPs. Simple.



The “formulaic” work in #8 and #9 is a **ONE-TIME** endeavour, needed only to **CREATE** the VP scales, but **NOT** needed to **USE** them. Once the scales have been created, they can be stored and used, by both people and computers.

SUMMARY AND EXHORTATION

The committee readily accepted technical criteria #1 and #2. For implementation criteria #3 through #10, in **EVERY** case the committee chose the option that was more user-friendly: Blitz points instead of infinite scales, the same maximum VPs for all scales, no negative numbers, no very large numbers, the familiar 20-VP maximum, enough precision to do the job (but not excess precision), and lookup tables instead of formulas.

Adjusting to anything new takes time. If decimals scare you, ignore them and look only at the whole numbers, which will be close enough to give you the right “feel” for how you’ve done. Enjoy that you will never be “pipped” again.

Once upon a time, imps were new. Before that, matches were scored by total points. The “comparison” was instantaneous. Each pair would keep a running total of its points. When they met, the two pairs would announce their totals. If the sum was positive, they had won. The introduction of imps meant that determining the winner was no longer immediate. It took a minute or two. Somehow the bridge world coped, and scoring by total points fell by the wayside.

Give the new VP scales a chance. You’ll like them.