The World Pilot Ranking System (WPRS), for all Hanggliding and Paragliding disciplines.

This version of the WPRS formula was accepted at the CIVL Plenary meeting in Austria 2009.

The formula is used for all disciplines in both Hanggliding and Paragliding.
There are some differences between classes, like minimum number of tasks and competitors and number of tasks required for full value of the competition.

The main aim of the WPRS is to rank pilots around the world in a fair manner, so the rankings will show the strength of each individual pilot, based on the competitions in which they have participated.

This version of the formula takes effect from March 1st 2009. All rankings from that date will use the new formulas and show the competitions in the last 3 years recalculated using the new formula.
Older rankings are unchanged in the WPRS system.

The pilot (participant) points are based on the sum of 4 best competitions in the last 3 years with time devaluation (Td) as it has been. Time devaluation is important in the formula because the value of the competition should decrease over time, otherwise we would have an "all time best in last 3 years" ranking instead of a current ranking

The rankings are for each class and discipline of hang- and paraglider competitions.
A pilot can be ranked in any of the rankings based on his participation in sanctioned competitions.

On following pages, the formula is described in detail.

More detailed explanation of the WPRS formula

Factors to consider:

1. Position ranking (**Pp**):
   The value of a participant's effort in a competition relative to the other participants in the same competition. This is calculated from the actual total scores from the competition (Gap or other scoring formula)
2. Competition ranking (**Pq, Pn, Ta**):
   The value of the competition relative to other competitions in the same ranking (using the competitions in the last ranking prior to the competition as benchmark).
3. Time devaluation (**Td**):
   The value of the competition should decrease over time, otherwise we would have a "all time best" ranking instead of a current ranking.
4. The number of results that should count for a participant in the ranking. It is sum of the points of 4 best competitions in the last 3 years.

The actual WPRS formula:

WPR = Pp*Pq*Pn*Ta*Td

To make the points more readable it is multiplied by 100 and round to 1 decimal.

WPR = round(Pp*Pq*Pn*Ta*Td*100, 1)

The participant's place in a given ranking (at a ranking date) is decided by the sum of the top 4 results in the last 3 years.

The **competition ranking factor** is based on **real differences** in the number of top-ranked pilots participating and the number of pilots participating in the competition relative to the number of pilots in the ranking and in the average competition for the given ranking.

Pilot Points (Pp)

The value of a person's effort in a competition relative to the other participants is calculated as a curve.
The curve is using the Pq so in competition with high ranked pilots the curve is fairly steep, but in competitions with lower ranked pilots it gets close to be straight line.
Pq has the value of 0.2 to 1.0 based on the rankings of the pilots in the competition.
As the formula uses Pq as power creating a curve and Pq varies, the curve varies.
So the formula use the maximum value comparing the value based on the actual Pq and if this was the highest valued competition with Pq = 1.0.

Pp=max(Pplacing^(1+Pq), Placing^2)
where Pplacing is (last place - pilot place+1/ last place)

Competition ranking (Pq, Pn, Ta)

In a perfect competition with all the top pilots participating **c** should be 1.0.
So, what to do with all those other competitions? Winning a competition with only beginner pilots or a competition with only one participant should give a **c** close to 0.0.

We use three factors to measure the value of a competition:

1. The quality of the participants (**Pq**).
2. The number of participants compared to other competitions in same ranking (**Pn**).
3. The success of the competition (**Ta**).

Pq*Pn*Ta

Participant quality (Pq)

Presumption: A competition with maximum quality of participants would be a competition where all the top ranked pilots participated.
To find **Pq** we use the last ranking prior to the competition and find the sum of ranking-points for the top 1/2 ranked pilots that are entered in the competition. Then we find the sum of ranking-points as if those pilots would have been the top ranked pilots of the world. This gives us 1.0 if the top ranked pilots had actually entered and 0.0 if no ranked pilots are entered.

To avoid **Pq** = 0 for comps with no ranked pilots set a lower limit of 0.2.

Pq = Pq_srp / Pq_srtp * (1 - Pq_min) + Pq_min

Pq_srp = "sum ranking-points of the top 1/2 ranked participants"
Pq_srtp = "sum ranking-points if they had been the top-ranked pilots of the world"
Pq_min = "minimum Pq"

Virtually no competition will get Pq = 1.0. Top competitions may get between 0.7 and 0.8 and there will be a difference between these.

Number of participants (Pn)

Pn = square root ("number of participants" / "avg. number of participants in competitions last 12 months")
if (**Pn** > Pn_max) **Pn** = Pn_max

Pn_max = 1.2, saying that a competition with slightly more than average number of participants is a good benchmark.

Looking at WPRS data on 01.01.2007 the average number of pilots in PG XC competitions is 69 pilots.
In HG class 1 the average number of pilots in competitions at that date is 43 pilots.

This formula handles the issue of **Pn** on the average in competitions for each discipline. It will also take into account change of average number of participants in competitions, like increasing interest in Paragliding Accuracy and Paragliding Aerobatics. For aerobatics the number of pilots is based on the average number of pilots in syncro and solo as if it is separate competitions.
No formula change is needed if the average numbers of pilots change in the next years.

Success (Ta)

One last thing one may consider is the success of the competition (**Td**), ie was it a fair competition. There are many ways to measure this, none is very objective or accurate.
As competitions in hanggliding and paragliding mostly involve a number of tasks we tend to use this as a measure of success.

Td values for Paragliding XC and Accuracy:

1 task: 0.5 (accuracy = 0)
2 tasks: 0.8
3 tasks: 1.0

Td values for Hanggliding class 1,2 and 5:

2 tasks: 0.8
3 tasks: 0.9
4 tasks: 0.96
5 tasks: 0.98
6 tasks: 0.99
>6 tasks: 1.0

This really means that a Paragliding competition has full value if there are 3 valid tasks, but a Hanggliding competition has only full value if there are 7 or more tasks.
Currently in Section 7a a Hanggliding competition is only valid if it has 2 valid tasks.
Currently in Section 7c a Paragliding Accuracy competition is only valid if it has 2 valid tasks.
Also in Hanggliding there is a minimum of 15 competitors in class1 and minimum of 6 competitors in class2 and class5 competitions for a competition to be valid.

Time devaluation (Td)

Td = 1/(1+ Td_a ^(DaysSinceEndOfComp/1096* Td_b - Td_b/2))

This gives an s-curve with x in the range 0 to 1096 (days or 3 years) and y going from 1.0 to 0.0.
Td_a = 2, **Td_b** = 20 (changing these will change shape of the s-curve).