Example of a short analysis: 17th stage, Tour de France 2009

In the world of professional top-class sports, it is extremely important to work quickly, efficiently and reliably. Powertec meets these requirements perfectly. The Powertec system can very quickly after a training session or race provide an analysis based on 4 parameters:

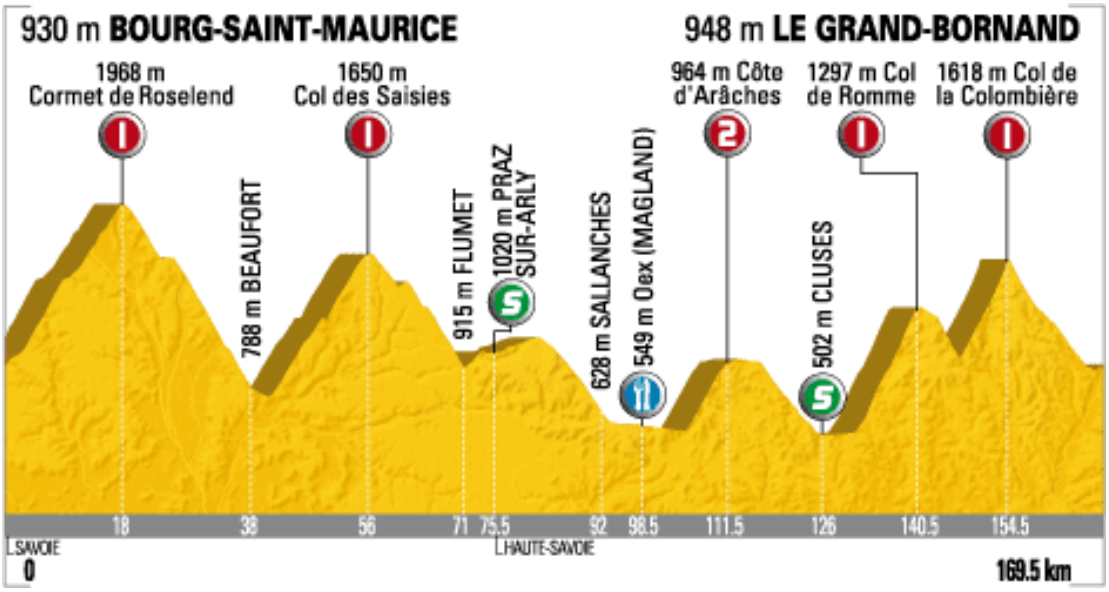
- General condition → power over the whole race or training session (PSS, P5min)
- Fitness of the body → reaction times of the heart, minimum heart rate (Trfast, HRmin)
- Fitness of the legs → explosivity (Pmaxfa)
- Total used energy → colour analysis (Wdur)

To demonstrate how fast a clear analysis is obtained – one of the strong points of Powertec - we demonstrate hereafter the 17th stage of the Tour de France based on the data of a participant who uses Powertec. With Powertec, it is perfectly possible to analyze the data of all 9 cyclists on the team in a very short time after the race. By means of the obtained results, cyclists can be coached more accurately and even team tactics could be adapted.

With a minimal Powertec experience, a short time means:
- For the rider: sending and analysis of the data = 10 minutes
- For the trainer: online checking of 9 analyses = 20 minutes

On the technical users area of the Powertec website, the 4 parameters mentioned above are explained into detail. In the example below, however, we assume that all parameters are known by the reader. All different analyses are made in colour.

A. Profile of the 17th stage

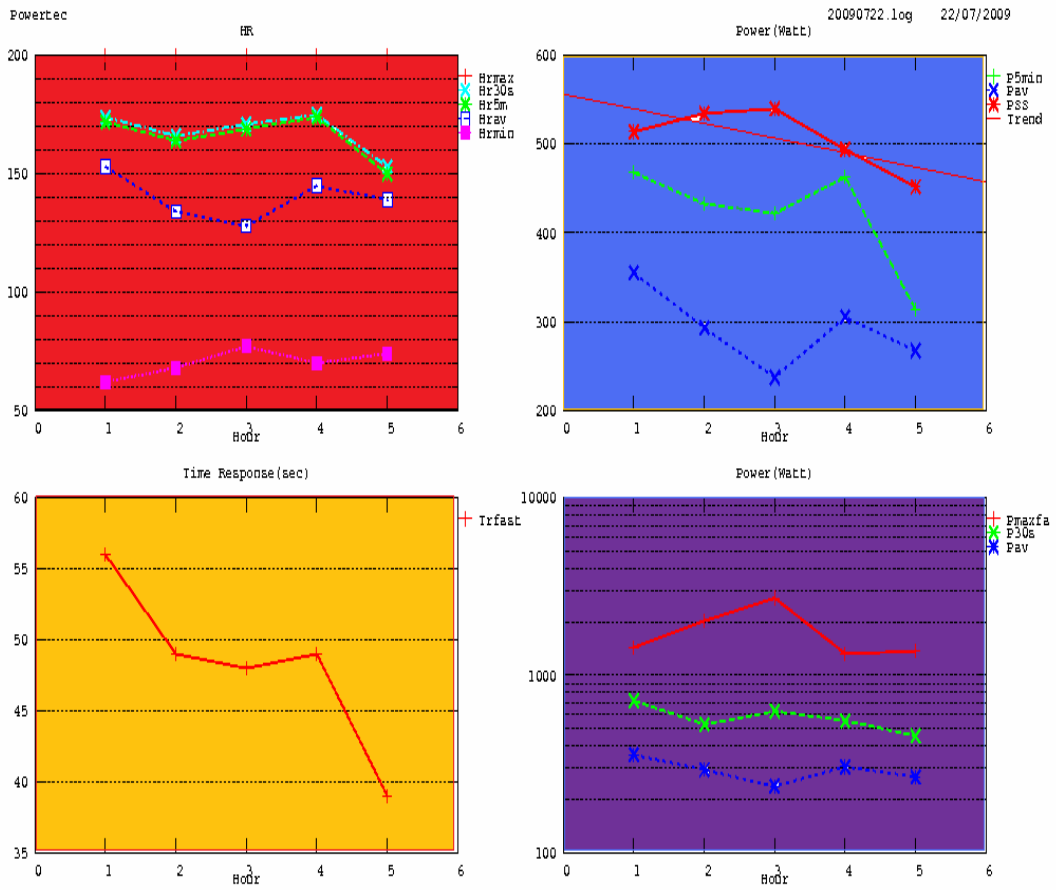


This was one of the most important and difficult stages of the Tour. The succession of the cols, the fact that the general classification was still completely open, the timing (3rd week) and the presence of the very steep and never climbed before Col de Romme turned this stage into one of the highlights of the Tour de France 2009.

B. Powertec analysis

After the participating cyclist has sent his data, Powertec made an analysis within a quarter of an hour as shown below.
The different blocks are coloured to highlight that 4 different analyses are obtained. In the actual version the blocks are not coloured.

1. *Power analysis*



PSS (1h) = 540 W PSS (4h) = 490 W Peak_session_HR = 175 bpm or 87 %

Hour	Trfast	Hrmax	Hrmin	error	Hrav	HR30s	HR5m	Hravu	HR30su	HR5mu	Pav	P30s	P5min	PMAXfa	PSS
1.0	56	200	62	5.2	153	174	172	152	174	172	355	718	468	1435	514
2.0	49	200	68	5.2	134	166	164	134	166	164	293	530	433	2026	535
3.0	48	200	77	6.9	128	171	169	128	171	169	237	626	422	2724	540
4.0	49	200	70	5.9	145	175	174	145	175	174	305	556	463	1326	494
5.0	39	200	74	3.2	139	153	150	139	153	150	267	456	313	1364	452

First, the measurements are evaluated on their reliability. In case of too many deviations or insufficient intensity, the values are coloured red. Those deviations to the model ensure these measurements will be considered invalid. This is necessary to avoid invalid conclusions. However, Powertec contains an automatized correction system that can interpolate and repair some of the deviations.

About the race in general:

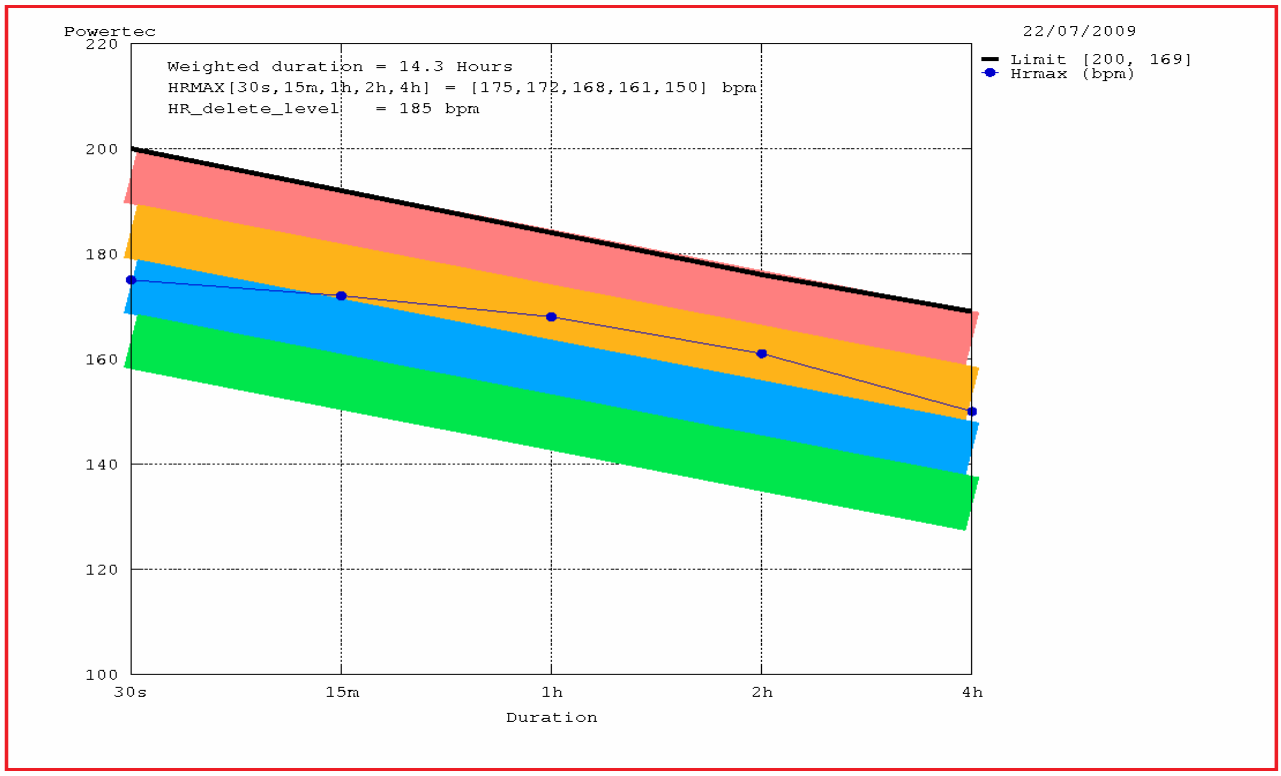
The hardest part of the race is clearly situated in the first hour. The riders shows High Pav, High P5min, High Trfast and the highest heart rate. After that, the race was clearly calmer until the end of the stage. When climbing the very steep Col de Romme, the system again registered a very high P5min (94% of the maximum).

In this way, the trainer can immediately discover how the race evolved. This information can only be obtained with the Powertec data and cannot be seen with the eye. By comparing the data of the different cyclists of the team, the sports director can see which riders had a good day and which riders felt bad.

Remarks:

- : The Hrmin (= minimal heart rate) starts low and raises steady, according to the effort. The low starting value indicates a good recovery..
- : The Trfast (= reaction time of the heart) starts high because of the fatigue from the previous day and the high PAV power of the first hour. Thereafter, the curve is decreasing until the end of the race. This is a very good development.
- : The Pmaxfa value (= explosivity) is high during the whole race. This is remarkable seen the difficulty of the stage.
- : The Pss value (= power during the whole race) scores high in the first 3 hours. Then, it decreases. This is not abnormal considering the difficulty of the race. The P5min reaches twice the limit of 90% of the Pss value. The trend line shows the same decrease, also not abnormal. Good curve.

2. *Heart rate analysis*



As the black line is a natural limit, you can consider this as an energy chart. In this way, it is very easy to see how deep the cyclist went. Easy, but very efficient!

Remarks:

- 14,2 Wdur is **normal** seen the difficulty of the race.
- The rider went deep: **orange** over 1 to 4 hours. This shows that the pace was quite high all day long.
- In the final, the pace was low: **blue** over 15m and 30s.

Conclusion:

The cyclist is still very fresh, despite the succession of races. He survived the 17th stage very well and does not have to worry for the next days. All parameters indicate that he is in **top form**. The trend of the previous stages continues. He is doing **very well**.

As Powertec is meant for daily use, an analysis must be made available quickly and easily. Both the trainer and the rider must be able to understand it - this is essential for maximising performance of the rider and the team!