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Expert interview with Rene Trosiner on the #seeitnovo test car

Vehicle prototypes undergo extensive testing, mainly using simulation and in the laboratory, but sometimes using real-life systems. That's how the Novo test car came into being. It has been performing test runs since April 2018. Engineer Rene Trosiner has a close connection with it: he played a key role in developing the Velaro Novo, and in this capacity acts as engineering project manager for the Novo test car. In this interview, he talks about the new train, and how important real-life tests still are, even in an age of digital simulation.

Rene Trosiner is technical manager at Siemens Mobility. Since 2015 he has worked on platform development for high-speed trains in the engineering department in Krefeld-Uerdingen.

The Novo test car has been plying the rails in Germany since April. What exactly is it testing?

The Novo test car is a measurement car that is designed to test our development work for the high-speed trains of the future. The new train includes many new developments, and we would like to make sure these are safe, as well as structuring our solutions to ensure they are robust. We are using this vehicle to test a huge field of parameters and subject areas. Fundamentally, it will cover all the innovations and all the refinements included in the new high-speed platform that need to be tested on a stand-alone vehicle.

Which subject areas are involved, exactly?

The focus is on the dynamic structural performance of the vehicle, in other words how it behaves under all kinds of operating conditions. Of course, all these aspects are simulated right at the start of the development process. But practice shows that a simulation provides only a limited degree of certainty, and a live trial is needed to generate a truly reliable result. We are also testing the robustness of the comprehensive lightweight construction solutions that we have incorporated. In all these ways, the new train stands apart from earlier projects.

We are also examining the aerodynamic improvements we have made in the new train, enhanced mobile communications in the window panes, the floor coverings, paint structure, and even the restrooms. A broad spectrum, in other words: everything that's feasible in a stand-alone test car will be checked off in the Novo test car in the next few years.

That's a lot of time and money.

Well, a number of times in the past we were confident that we had covered everything with simulations and calculations at multiple points. But then experience showed that, while that often was the case, there were also times when it wasn't. And that there are a few parameters for which it makes sense to perform actual testing. The second aspect is that we have incorporated a wide range of refinements into the vehicle, and we also want to vary some parameters in the test car. We are therefore deliberately not operating the Novo test car in a single, unchanging version, but are constantly adjusting various parameters.

How much influence will the result of the test runs have on the final train?

It will affect the future train insofar as the tests will give us even more detailed knowledge about which solutions proved to be robust, and which solution best satisfies the various customer requirements, for different route layouts, for example. The Novo test car will therefore give us the opportunity to offer a customized product.

What exactly does the measurement process involve?

On its first run, the test car is hauled by a locomotive, and it is then integrated into the ICE-S test train operated by Deutsche Bahn Systemtechnik. The necessary measuring equipment is fitted first. That means attaching hundreds of sensors in the bogie area, in the add-ons in the bogie area, in the interior, and on the roof. The measuring equipment itself is inside the vehicle. Naturally, there are people on board. But they're exclusively measurement technicians with laptops, or sometimes measuring devices – to take noise readings, for example.

That sounds like a large team of testing personnel.

The number of people performing the measurements for us is in the double digits. And you can sense the enthusiasm that every one of them has for this new project. It was also evident from the fact the test car was very popular here in our factory buildings. Otherwise, of course, the engineers in the team deal with the product in a virtual environment. It has been possible for Manufacturing and Engineering to gather a lot of knowledge right at the assembly stage by working together on the vehicle. In general, the test car is not the work of any one individual, but the result of outstanding performance by the whole team. Projects like this succeed or fail depending on the team you are working with. And I am proud of my team.

You take a ride too sometimes, no doubt.

While I'm not a measurement engineer, I won't miss out on the chance to go along for a ride. I want to experience, firsthand, what the entire team has designed and accomplished, and what the test car can do. That is definitely something very special for me. But this isn't about me, it's about the knowledge we can get from the test car.

What if there is a setback?

If a test run does not confirm the expected or forecast results, that's still knowledge we have gained. Testing also depends on learning and understanding why certain things haven't worked. That's my take on it. But I'm fairly certain that we won't experience that situation often.

The Novo test car has its own hashtag: #seeitnovo. How would you describe this statement in your own words?

The new way of looking at things represents the range of technical improvements the new train brings with it. Above all, from an engineer's viewpoint, there is the question of aerodynamics and power consumption. Visually, it's a different train, too – and that is evident when you look at the Novo test car. That's because we have greatly increased the number of aerodynamic features, and structured them in a way you can see. For me, that's what #seeitnovo is all about.

Have you discussed the Novo test car with customers?

Yes, we have, and they seemed very taken by the idea that Siemens has made the decision to do something that is unusual on the rail market these days. In other words, to build a real measurement car and run it in the middle of day-to-day transport operations. Our approach is therefore fully appreciated. Simulation helps, but the reality can be seen only once the train is on the track.

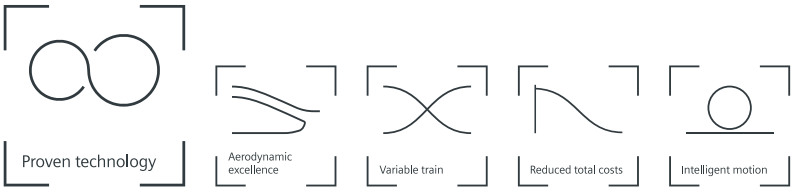
Is this one of the reasons for the new approach to the new train?

And how did that influence the general conditions that were defined for the development process?

We rethought the new train from the ground up, and cut ourselves loose from the general conditions that applied up until now. We questioned all the solutions that we had previously offered our customers, and redefined the requirements. You could say we started over again with a blank page. At the beginning of the platform work, for example, we deliberately did not copy a set of specifications from an experienced customer and think about how we would need to modify it. Instead, we considered what we would have to do to offer our customers a good, efficient, and reliable train for the future.

Rene Trosiner, thanks a lot for the interview.

This interview is part of our series of expert interviews about the Velaro Novo.



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