

North American Eagle, Inc.

Breaking the land speed record with Dassault Systèmes and Microsoft



Overview

■ Challenge

A North American team seeking to break the land speed record needed to design and test its vehicle to achieve speeds of more than 800 miles per hour.

■ Solution

Using CATIA V5 operating on a Microsoft Windows platform, the team can design and test vehicle components to ensure project success and driver safety.

■ Benefits

CATIA V5's simulation tools ensure the vehicle can withstand the stresses of trans-sonic speeds and enable the collection of data never before available to the aerospace community.

"With partners like Dassault Systèmes and Microsoft, there is nothing that is insurmountable now."

Ed Shadle
Co-Owner and Driver
North American Eagle

Speeding to success

Like the test pilots of the 1950s who dreamed of breaking the sound barrier, a team of North American engineers and racing enthusiasts is attempting to break the land speed record of 763 miles per hour set by a British team in 1997. The dream began almost 10 years ago with few resources, but a strong vision of a land speed vehicle based on an F104 Starfighter aircraft fuselage.

Ed Shadle and Keith Zanghi, co-owners of the vehicle and project, and a dedicated team of almost 40 volunteers work regular jobs during the week as everything from aerospace engineers and computer specialists to teachers and truck drivers and commit weekends to reaching speeds of more than 800 mph. With a refurbished and repurposed fuselage once flown by test pilots Scott Crossfield and Chuck Yeager and the cutting-edge design and testing capabilities of CATIA V5 software from Dassault Systèmes, Shadle and Zanghi believe their goals are safely in reach.

CATIA V5 makes project viable

Although Shadle says the project is finally technologically viable, the team still faces three major challenges before it will be ready to try to break the record. First, it must complete the high speed wheels required to move beyond the 300 mph test speeds already achieved. Second, it must simulate and test the aerodynamic design of the vehicle and its control systems to ensure it can safely withstand trans-sonic speeds. And last, but certainly not least, the team needs additional sponsorship to help finance the project, which has largely been funded by the co-owners thus far.

Zanghi and fellow team member Steven Wallace are both experienced CATIA users thanks to their day jobs with Boeing. With the capabilities of the software running in the Microsoft Windows XP Pro environment, they have been able to digitize data on the vehicle that will allow the team to complete structural analysis using computational fluid dynamics and finite element analysis.



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“CATIA is the only product out there that we can use to get over this next technology hill,” Zanghi says. “Design time now will be more efficient and we’ll be using real facts and data rather than speculation.

“The team now has the digital data it needs to go to the next step. “Without it, we wouldn’t be going anywhere,” he says. “This is a real milestone in the project.”

Mitigating risk

Without CATIA V5, Zanghi speculates they may have managed to design a stable platform to 700 or 750 mph, but doubts they could have broken the record.

Wallace, who monitors more than 70 vehicle sensors that gather physical data such as resonate and force vibration, says many of the design adaptations will now come from solid model testing in a supersonic wind tunnel, rather than using the actual vehicle and Shadle as “guinea pigs” in desert ground tests.

“This will improve safety 100% and shorten our cycle time to breaking the world land speed record,” he says. “Using CATIA, we can eliminate all of the giant unknowns right at the trans-sonic stage. Basically it mitigates the risk.”

Zanghi also credits the benefits of Microsoft’s Windows XP Pro operating system for the team’s current success. It’s fitting, he says, that the world’s most powerful car relies on the world’s most powerful operating system.

Effectively communicating with team members and partners around the world depends on the common platform offered by Microsoft products, Zanghi says. Microsoft Office 2007 Pro, Visio, Project and Windows Mobile provide the tools the far-flung North American Eagle team members need to interact effectively. The team also plans to implement Microsoft LiveMeeting to help meet its remaining design and logistical challenges.

The North American Eagle team hopes to make its first attempt to break the record in the fall of 2007.

“With Dassault Systèmes’ and Microsoft’s involvement, we have the digital data to go to the next step; without it, we wouldn’t be going anywhere.”

Steven Wallace
Data Acquisition and Analysis Leader
North American Eagle



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