

QUARTERSIM^{US}

Issue Q3 2025

Bringing You the Latest Insights, Innovations, and Stories



Letter from the President

Hi all,

As we head into the second half of the year, I wanted to take a moment to look back on what's been a busy — and energizing — few months here at TotalSim.

This past quarter, our team had the opportunity to take part in some exciting conversations shaping the future of engineering. In May, we attended the Vertical

Flight Society's (VFS) 81st Annual Forum —always a standout event but our first time exhibiting there which was a great experience. It was inspiring to see how simulation (virtual testing) continues to drive innovation along with physical testing in next-gen aerospace and vertical flight.

Back in April, I had the chance to chat with the team at Siemens Digital Industries Software about all things thermal management —especially how simulation is helping tackle the heat and complexity brought on by AI and high-performance computing. That conversation was a great reminder of just how fast this space is evolving — and how important it is to stay ahead of the curve. Just last week, we hosted our own webinar on Data Center Design and Performance, exploring how CFD simulation can make these systems more resilient and efficient and allow engineering forms to get design right before shovels hit the dirt.

Looking ahead to Q3, we're excited to keep that momentum going. I am attending another VFS meeting in a few weeks, this time the Electric Aircraft Symposium held each year in conjunction with EAA Airventure at Oshkosh. I've attended for several years but this year we'll have an exhibit table during the Symposium July 19-20. [It's also a good 'business excuse' for me to continue my streak of attending Oshkosh - again I'm planning to fly-in with my Piper and camp under the wing in the North 40]

There's a lot on the horizon, and we're looking forward to taking on new challenges across various industries, collaborating closer with more of you, and continuing to push innovation forward together.

Thanks for being part of the journey—we're just getting started.

*Best,
Ray Leto
President, TotalSim US*

TotalSim Bulletin

Q2 Company News

In May, TotalSim had the exciting opportunity to attend the Vertical Flight Society's 81st Annual Forum & Technology Display in Virginia Beach. As the premier

international event for vertical flight technology, the Forum brought together over 300 technical papers and expert presentations from leaders across the military, government, and industry. We were proud to have a booth on the exhibit floor, where we connected with fellow innovators, customers, and collaborators. It was an excellent chance for us to showcase our latest work, share insights, and stay at the forefront of advancements in vertical flight. The energy at the event was electric, and it was inspiring to see the collective effort driving the future of aerospace forward.

In other big news, TotalSim has officially entered into a strategic partnership with M4 Engineering Inc. to tackle the complex engineering, prototyping, and testing challenges of advanced vehicle development. M4 is widely recognized for their capabilities in design, analysis, optimization, and prototyping, while TotalSim brings deep expertise in computational fluid dynamics (CFD) and high-performance computing (HPC). Together, we aim to offer integrated structural and fluid design solutions, increased support for engineering software and services, and a strengthened innovation pipeline from simulation all the way to full-scale prototypes. This partnership represents an exciting step toward providing more holistic, high-impact solutions to our clients.

We're also thrilled to welcome a new engineering intern, Franky Lian, from The Ohio State University—one of our favorite places to find fresh talent! Franky brings hands-on experience as the Aerospace Project Lead for the Buckeye Solar Racing team, where he's been producing CAD models, designing hinging canopy components with SolidWorks, and improving aerodynamics with Ansys Fluent simulations. He's also a member of The Buckeye Space Launch Initiative's avionics team, where he works with embedded systems, sensor communication in C, and PCB manipulation using STM32 microcontrollers. We're excited to have Franky on board and can't wait to see what he contributes during what's shaping up to be a dynamic and innovative summer.

QuarterlyRead

Revolutionizing Engineering with HPC and GPUs

In today's high-stakes engineering environment, speed, accuracy, and innovation are everything. To stay ahead, companies are turning to High-Performance Computing (HPC) and Graphics Processing Units (GPUs)—technologies that are transforming how products are designed, tested, and delivered. This post explores

how businesses of all sizes can tap into these tools to cut costs, accelerate development, and unlock the next generation of engineering innovation.

The Power Behind the Performance

HPC and GPUs are reshaping engineering workflows. While CPUs handle tasks one at a time, GPUs—with thousands of processing cores—can handle massive workloads in parallel. When paired with HPC systems, they enable engineers to run complex simulations like computational fluid dynamics (CFD), finite element analysis (FEA), and multi-physics modeling—all in a fraction of the time.

From faster design cycles to higher-fidelity results, the impact is tangible.

Why It Matters for Your Business:

- Accelerated Design Cycles
 - Simulations that once took days can now run in hours—or minutes—enabling rapid iteration and faster time-to-market.
- Higher Accuracy, Better Designs
 - Model complex systems in full detail, explore multi-physics behavior, and gain insights that lead to smarter, more reliable products.
- Cut Costs with Virtual Prototyping
 - Replace expensive physical prototypes with high-speed simulations. Tesla, for example, uses GPU-driven tools to optimize crash safety before building a single car.
- Unlock AI-Driven Innovation
 - From generative design to predictive maintenance, GPUs also power the AI tools that are redefining how engineers solve problems.
- Real-Time Collaboration
 - Tools like NVIDIA Omniverse enable real-time rendering and interactive 3D design reviews—ideal for distributed teams.

How to Start Leveraging HPC and GPUs

1. Use GPU-Accelerated Software

Adopt tools like Simcenter STAR-CCM+ or Siemens NX—designed to take full advantage of parallel computing power.

2. Go Cloud-First

Platforms like AWS, Azure, and Google Cloud offer scalable, cost-effective access to GPU-powered HPC—no need to invest in massive on-site infrastructure.

3. Bring AI into the Workflow

Leverage machine learning for tasks like topology optimization or performance prediction. GE's use of AI to design lightweight turbine blades is a great example.

4. Invest in Skills

Upskill your team in GPU programming (CUDA, OpenCL) and HPC workflows—or partner with vendors like NVIDIA to accelerate adoption.

5. Start Small, Then Scale

Test the waters with a pilot project. Measure ROI, then scale across products, teams, or business units.

Industry Impact

- Aerospace – Simulate airflow and reduce drag for more efficient aircraft designs
- Automotive – Optimize battery thermal performance and safety simulations
- Energy – Improve wind turbine efficiency with predictive simulations
- Civil Engineering – Model how buildings perform in extreme weather or seismic events
- Manufacturing – Enhance quality and reduce waste in additive manufacturing

Overcoming the Challenges

While the benefits are compelling, businesses should plan for:

- Cost: Hardware can be expensive—cloud HPC helps reduce barriers to entry.
- Talent: Skilled teams are essential—training or partnerships can fill the gap.
- Data: Simulations create big data—ensure you have robust storage and networking in place.

Looking Ahead

The future of engineering lies in real-time digital twins, AI-driven design, and quantum-inspired computing—all enabled by HPC and GPU advances. The

companies adopting these technologies today will be tomorrow's leaders in innovation, efficiency, and resilience.

Ready to Revolutionize Your Workflow?

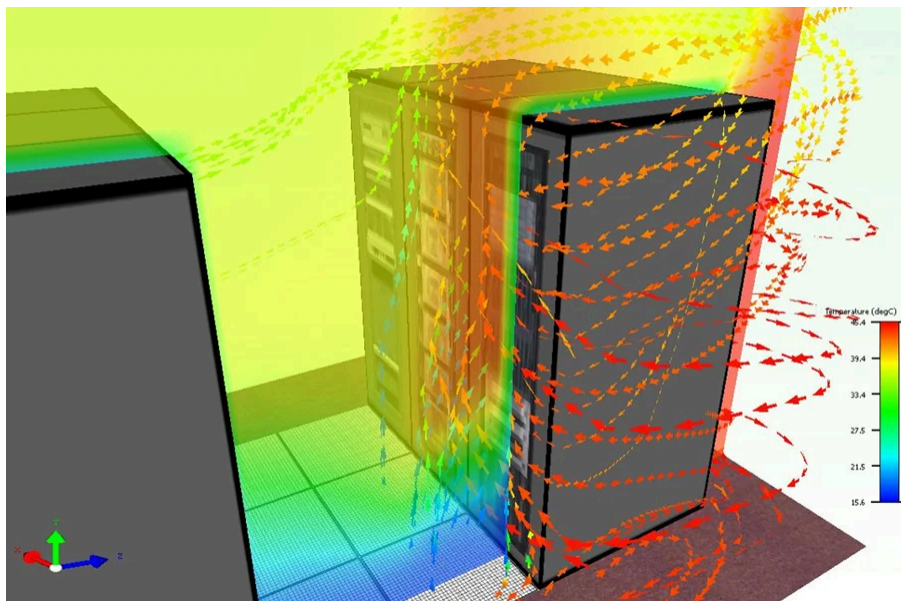
HPC and GPUs aren't just for tech giants anymore. Whether you're designing aircraft or consumer electronics, these tools can help you build smarter, faster, and better. Explore cloud HPC options, connect with vendors like NVIDIA or AMD, or start small with a pilot simulation project.

The future of engineering is here—are you ready to lead it?

Quarter in Review: Events

This past quarter, the TotalSim team stayed busy sharing insights and connecting with the community. We participated in the **Vertical Flight Society's 81st Annual Forum**, where we explored the future of advanced air mobility and rotorcraft innovation. We also hosted a well-attended webinar on **Optimizing Datacenter Design and Performance** on **June 26th**, where attendees learned how CFD plays a critical role in managing thermal challenges in high-performance computing environments. Thanks to everyone who joined us!

From the Field



Keeping modern data centers cool—especially under failure scenarios—is no easy task. In this quarter’s featured case study, TotalSim partnered with a building services contractor and design team to support their bid for a cutting-edge data center project. Using STAR-CCM+ and advanced CFD analysis, we evaluated airflow patterns, simulated HVAC failure modes, and even assessed acoustic performance to ensure a resilient, thermally balanced design.

The result? A more reliable layout with all key zones staying safely below temperature thresholds—even in worst-case conditions.

See how simulation improved performance, reduced risk, and helped secure the win in the full [case study](#)!

Upcoming Events

TotalSim is heading back to Oshkosh! We’re excited to attend the [Vertical Flight Society’s Annual Electric Aircraft Symposium](#), happening **July 19–20, 2025**, at the **University of Wisconsin Oshkosh**.

Last year, Ray flew in on his own plane to join thousands of aviation enthusiasts at AirVenture—exploring air shows, rare aircraft, and reconnecting with longtime friends and clients. We’re looking forward to doing it all again this year as the aviation community gathers to push electric and advanced air mobility forward.

Will you be in Oshkosh? Let us know—we’d love to connect, chat about future flight, and maybe even share a drink under the wing of Ray’s plane.

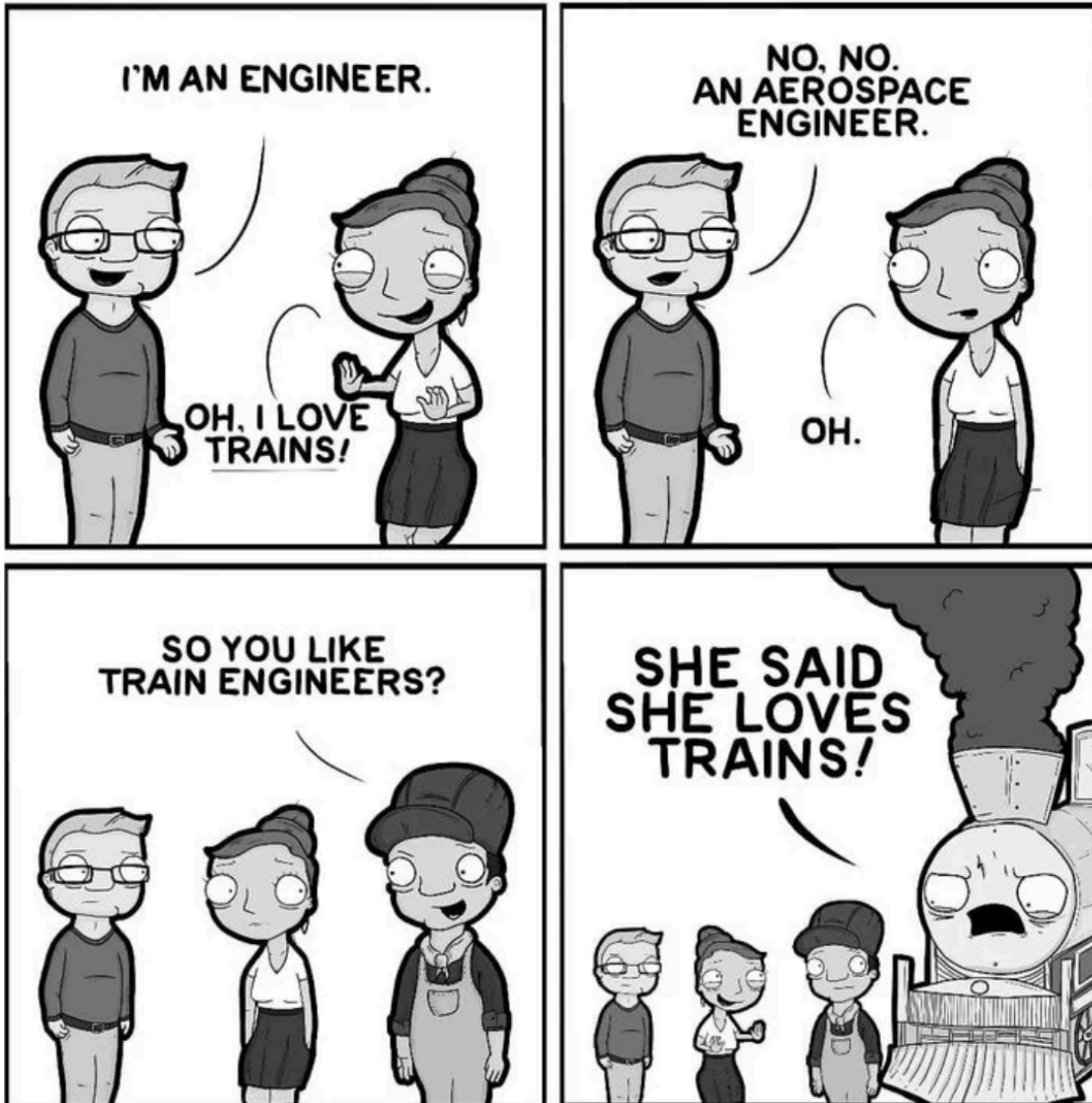


Blast from the Past

This quarter, we're revisiting a standout blog post from the archives: [Elevating Aviation: How STAR-CCM+ Transforms Aerodynamic Performance Analysis](#). This piece dives deep into the critical role that STAR-CCM+ plays in the aerodynamic development process. From its ability to simulate real-world physics with high accuracy to its integration of multidisciplinary analysis in a single platform, STAR-CCM+ has become a cornerstone of TotalSim's toolset for solving complex problems in air vehicle design. The blog explores specific use cases and highlights how our team leverages the software for everything from concept evaluation to detailed performance analysis, ultimately helping clients streamline development and enhance design performance.

We're also shining a light on a great technical webinar we hosted last year, titled [Enhancing CFD Workflows with STAR-CCM+ and TotalSim Expertise](#). The session explored practical strategies for improving CFD efficiency and accuracy, and gave viewers an inside look at how we integrate our customized workflows with STAR-CCM+ to solve real-world challenges in automotive and aerospace applications. Greg covered key topics like automation, design exploration, and multi-physics simulation, sharing insights from our work with NASCAR that demonstrate TotalSim's unique approach to data-driven design.

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Industries Where We Excel



