

CUSTOMER CASE STUDY

Commonwealth Fusion Systems uses AVEVA™ Unified Engineering in the cloud for engineering and design work

Commonwealth Fusion Systems - www.cfs.energy
Industry - Power

Goals

- Improve design and engineering efficiencies
- Achieve collaboration across the virtual teams through shared data models
- Ensure high levels of design and engineering accuracy with limited re-work
- Eliminate IT overheads

Challenges

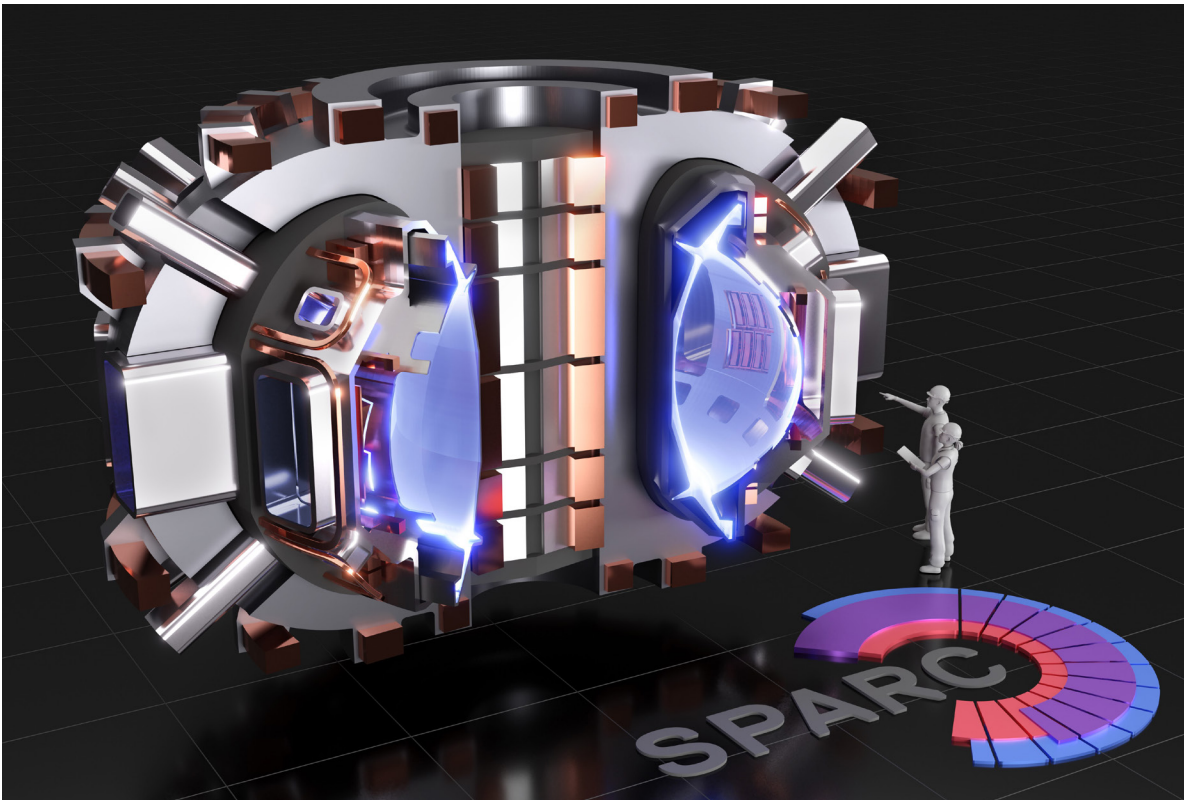
- Adhering to tight project deadlines and budget
- Enabling close collaboration in geographically dispersed teams

Solution

- AVEVA Unified Engineering
- AVEVA™ Connect
- AVEVA™ Flex

Results

- Reduced project time schedules
- Improved accuracy, eliminating the need for re-work
- Eliminated IT overhead by running the solution in the cloud
- SaaS model delivered commercial advantages for fluctuating usage



A cutaway rendering of SPARC, a commercially relevant net energy fusion device currently under construction in Devens, MA. Credit: Courtesy of CFS

Commonwealth Fusion Systems (CFS) uses AVEVA Unified Engineering in the cloud to enhance the efficiency and collaboration of its remote-working engineering and design teams.

Clean and limitless fusion power

CFS is working to commercialize fusion energy to deliver clean, limitless power to the world. CFS spun out of MIT and is supported by the world's leading investors in breakthrough energy technologies. It has assembled a world-class team – with experts in magnets, manufacturing, and plasma physics – and is uniquely positioned to deliver a fast path to commercial fusion energy.

What is fusion?

Fusion occurs when two light atomic nuclei (like hydrogen) combine to form one or more heavier nuclei (like helium). The result of this process is the release of enormous amounts of energy. Fusion offers the possibility of unlimited, carbon-free electrical power. It is the same natural process that powers our sun and other stars.

Engineering and design solution with minimal IT overheads

CFS is currently constructing a fusion net energy device called SPARC that will prove fusion can work as a commercial energy source. To reach its goal, the CFS team needed an engineering and design solution that would enable all engineers to work remotely. The solution would also need to ensure that the engineers could all collaborate from, and publish to, the same single version of data in real time. The team preferred a cloud-based solution because it would deliver the collaborative engineering approach CFS sought.

Reducing the need for re-work to drive efficiencies

When choosing their solution, CFS consulted with its engineering and design teams to establish their solution preferences. The team needed to work extremely efficiently to meet project goals. As a result, they needed an integrated, flexible, and multidisciplinary solution that eliminated the risk of clashes and re-work.



CFS worked with [Wonderware North](#), an AVEVA Select re-seller and partner in the USA, and selected [AVEVA Unified Engineering](#) in the cloud, which sets the standard for capital project engineering and design collaboration. It integrates all process simulation and engineering (1D, 2D and 3D) data in one single data-centric hub on AVEVA's secure cloud environment, [AVEVA Connect](#). Bi-directional information flow offers the ability to execute concurrent, multidisciplinary engineering tasks for greater control over the entire project, reducing project risk while simultaneously enhancing project efficiency and sustainability.

The solution's ability to scale as the project grew was another reason that CFS enlisted AVEVA's help. AVEVA's expertise in the field of asset operation management, founded on the digital twin, meant that as the project progressed, CFS would be able to easily extend its use of AVEVA solutions as needed to any additional capabilities in the same AVEVA Connect workspace, providing a single digital thread from engineering to operations.

CFS spun out of MIT with the goal of commercializing fusion energy to combat climate change. Since 2018, it has raised more \$2B and has grown to more than 200 employees.

“We are a virtual team – all working remotely – and we benefit from a reduced need for IT infrastructure and hardware. It was essential to CFS that we adopt a cloud-based engineering and design solution that capitalized on our existing freedom of minimal IT maintenance and software-upgrade overheads. A solution that would extend from the engineering phase to the project execution phase and help us with asset operations as we move beyond the pilot, was also high on our wish list.”

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Will Davis
Head of Instrumentation and Control, CFS

Integrated solution speeds up project delivery and delivers accuracy

CFS's design teams are now using SaaS-based AVEVA Unified Engineering, which allows them to share vital 1D, 2D and 3D engineering data and, just as importantly, it allows teams to design and build simultaneously. The solution allows them to add engineering details to the designs and, as they develop data models, they can also specify how each component relates to the next.

The solution's integrated approach shortens development time and streamlines processes since the team doesn't need to use different systems for piping and instrumentation diagrams (P&ID) or in the front-end engineering and design (FEED) stage.

The AVEVA solution's ease of integration also removes the need for manual cross-checks of updates across separate systems. The team at CFS estimates that these more efficient working practices reduced project time. In addition, AVEVA Unified Engineering helps CFS achieve high levels of accuracy, eliminating the need for re-work.

The power of the cloud

The cloud-based solution has removed the IT burden associated with the maintenance of an on-premise solution. Software upgrades, data storage, maintaining high availability and security are seamlessly handled by AVEVA so that CFS can allocate its IT resources elsewhere.

“CFS has numerous timelines to meet in order to ensure that we hit SPARC's targeted go-live date. AVEVA Unified Engineering on AVEVA Connect has enabled our team to work extremely efficiently, reduce re-work, and hit our deadlines.”

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Pat Schweiger
Head of Engineering, CFS

CFS has also adopted the AVEVA Flex SaaS subscription model, which delivers commercial benefits through a flexible and highly scalable licensing approach. This allows CFS to scale users and user types based on the number of people using the solution each day. This has proved to be particularly valuable for organizations that have fluctuating solution usage.

The focus is on delivering clean power

AVEVA Unified Engineering enables CFS's multidisciplinary engineering teams to work together effectively, allowing geographically dispersed teams to develop and maintain the detailed definitions of all the key engineering items involved in the design and build phases of capital project execution. With the help of AVEVA's portfolio of industrial solutions, CFS's engineering processes are more flexible and collaborative.