Aveva Marine, the integrated marine design and production application, now benefits from a product aimed at bridging the gap between 3D Mechanical CAD (MCAD) and other systems used in marine outfitting.

Aveva Mechanical Equipment Interface is a stable and efficient solution for importing 3D models of mechanical equipment into the Aveva Marine environment in a way that is appropriate for multi-disciplinary plant layout and marine designs.

Mechanical equipment is usually designed using 3D MCAD products which deal with ‘sculptured’ parts such as castings or machining, whereas Aveva PDMS and Aveva Outfitting deal with complex assemblies of large numbers of relatively simple geometric objects. Each solution is optimal for its purpose, but the two are based on incompatible mathematical principles.

“The fundamental incompatibility between MCAD and plant or outfitting design systems has long been a barrier to reliable 3D design exchange,” said Derry Vaughan, product marketing manager, Aveva Plant. “This has previously led to costly rework in construction and installation”. Aveva reports that it has now overcome this incompatibility in an innovative and unique way by incorporating B-Rep capability to define equipment items in the Aveva PDMS/Outfitting design database.

To save time at the design stage, users are now able to quickly and easily import accurate and detailed equipment models and expose them to the full capabilities of PDMS or Outfitting, as well as other Aveva solutions. Further benefits of the new system include elimination of many potential sources of error and rework, and improved productivity across the entire project.

“Importing 3D models from different MCAD systems involves more than just importing a 3D image,” said Mr Vaughan. “Imported models must be fully usable, not only in the entire design and construction process, but also through to subsequent operation and maintenance of the facility.”

As the imported item becomes a native PDMS/Outfitting object, it can fully interact with all the other objects in the project model and carry a wide range of attributes which support other important uses, such as weight and centre of gravity calculations.

As with all projects, the generation of accurate and complete production deliverables is essential. Imported models can be sectioned and clipped, and will appear in all relevant project and production deliverables such as plans, sections and other dimensioned general arrangement drawings.

In one example of a Mechanical Equipment Interface application, ASC, the Australian owned defence contractor, recently completed the successful transfer of the digital model of the Collins-class submarines from a legacy system to Aveva Marine. Following a multi-billion dollar through-life support contract with the Australian Defence Materiel Organisation for design enhancements, maintenance and support of the Collins-class submarines, ASC recognised the need to further improve its ability to manage legacy data as well as new information arising from the through-life support programme.

By automating the transfer of the data model from its legacy systems into Aveva Marine, ASC can reuse the original Collins-class design data in an optimal way while providing the most advanced solutions for new programmes.

“Aveva Marine’s open architecture enables integration with other third-party solutions ensuring interoperability,” said Peter Finch, president, Aveva Asia Pacific. “This is especially important in the naval sector as a project’s lifecycle from design to decommissioning may span over four decades. During this period, there are bound to be multiple systems used to design, build, maintain and upgrade the project.”

Aveva Marine has been used in advanced naval projects in the US, Europe and Asia Pacific. The company says that where complex systems are involved, it can support global collaboration with multiple stakeholders and subcontractors in a secure environment.

The general manager of design and engineering at ASC, Jack Atkinson, said: “ASC continues to build a strong partnership with Aveva, and this will ensure the ongoing success of our current and future projects.” In June, ASC docked its first submarine at ASC West – the A$35 million purpose-built submarine support facility located at the Australian Marine Complex (AMC) in Henderson, Western Australia.

Brought to land aboard the AMC’s floating
The Friendship system offered higher mesh quality and increased efficiency.