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News Release: Australian collaboration to advance naval shipyard technology

DMTC Limited is working with BAE Systems Maritime Australia, ANSTO and the University of Wollongong to develop advanced welding technologies for use on naval shipbuilding programs such as the Hunter Class Frigate Program.

Collaboration between the industry, research and academic organisations will take place over two years and is expected to result in production efficiencies in the construction of complex warships by incorporating artificial intelligence to reduce weld rejection rates, increase throughput and improve workforce skills in shipbuilding.

BAE Systems Maritime Australia is designing and building nine of the world's most advanced anti-submarine warfare frigates for the Royal Australian Navy. Investment and technology development across the highly automated Osborne Naval Shipyard is driving digital transformation in shipbuilding through advanced robotics, additive manufacturing and Industry 4.0 utilisation.

While Osborne's production facilities incorporate state-of-the-art robotic welding, the organisations believe this phase of research and development could identify opportunities to further automate and optimise weld sequencing, which is critical in ensuring the stability and life of welded structures such as steel bulkheads and panels.

Weld sequencing for ship construction is considered a complex, manual and time-consuming process and the research will focus on an optimal model that improves structural analysis to reduce "distortion" in the welding of units and the 22 blocks that make up each Hunter frigate.

Initial work will take place at ANSTO and the University of Wollongong before moving into trials at Osborne. To optimise the weld sequencing in panel/unit/block fabrication and consolidation, a streamlined process will be developed to ensure the accuracy of weld modelling inputs, robotic programming outputs and weld control programming.

The project will establish a sovereign capability in optimising weld sequencing and builds on DMTC's long history in working on industrial projects to reduce weld-induced distortion on various defence platforms.

The research forms part of broader work to deliver Australian Industry Capability outcomes under DMTC's Naval Shipbuilding and Sustainment Program, an industrial innovation partnership with Defence's Capability Acquisition and Sustainment Group.

Mark Hodge, Chief Executive Officer DMTC:

"One of the hallmarks of DMTC's approach, and it's really the essence of innovation, is to constantly look to facilitate the rapid adoption and application of technology, including in new areas of endeavour. This project is a good example, with its blend of fine-tuning existing technologies and developing novel optimisation methods that are unique to the shipyard."

Jim Cuthill, Operations Director & Shipyard General Manager, BAE Systems Maritime Australia:

"This project will be transformative for block production across our shipyard by ensuring our manufacturing is smarter and includes efficiencies at every step of the welding process. We're excited by the opportunities this will enable as we move towards full production for the Hunter frigate program and establish a continuous naval shipbuilding capability in Australia."

Dr Suzanne Hollins, Head of Research, ANSTO:

“We are pleased to provide our scientific expertise and facilities to support the establishment of this sovereign capability in Australia, and the defence industry more generally.”

Dr Paul Di Pietro, Dean of Research Knowledge Exchange and Translation, University of Wollongong:

“Researchers from the Facility for Intelligent Fabrication at UOW have a long history of collaborating with defence industry to translate welding and automation research for Naval applications. We are excited at the continued opportunities this project presents in utilising our capability for this new chapter of Australia’s Naval Shipbuilding Enterprise.”

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