Senate Economics Reference Committee

Future of Naval Shipbuilding in Australia

ANSWER TO QUESTION ON NOTICE

Department of Defence

Topic: SERC - Future of Australia's Naval Shipbuilding Industry - Q1 - Pump Jet Efficiency Across the Entire Speed Range - The Committee

Question reference number: 1

Senator: Chris Ketter
Type of question: Written
Date set by the committee for the return of answer: 3 April 2018

Question:

1. In a 31 October 2017 ASPI interview (The Strategist Six: Greg Sammut) by Brendan Nicholson, the Department of Defence ('Defence') maintained that a pump-jet can be efficient across the entire speed range. In light of the paper by Mr Aiden Morrison (A comparison of pump-jets and propellers for non-nuclear submarine propulsion), does Defence still maintain that that is the case?

Answer:

The efficiency of pump-jets designed for submarine use cannot be determined through comparisons with water-jets and ducted propellers, which are different in their operation from pump-jets. Moreover, the global efficiency of submarine pump-jets cannot be derived from ‘open water’ tests of pump-jets, where the pump-jet is assessed independently of the hull of the submarine.

A correctly designed pump-jet, suited to the aft hull shape of the submarine, achieves better optimisation of efficiency and stealth than any propeller, even at low speeds.