

### Launching of the Republic of Singapore's First Type 218SG Submarine

- **First Type 218SG submarine named Invincible at launching ceremony**
- **DSTA and thyssenkrupp Marine Systems dive into additive manufacturing for submarines**

One of the most advanced diesel-electric submarines in the world was launched on 18 February at the thyssenkrupp Marine Systems' shipyard in Kiel. The boat is named Invincible. This marks another important milestone in the ongoing submarine program for the Republic of Singapore. Prof. Ivy Ng, wife of Dr. Ng Eng Hen, Minister for Defence of the Republic of Singapore, named the boat in the presence of high-level representatives from the Singapore government and Navy, as well as high-ranking German officials. In addition to representatives from thyssenkrupp, there were also representatives from suppliers in attendance for the ceremony. After construction and outfitting is completed, Invincible will undergo intensive testing before being handed over in 2021.

Dr. Ng Eng Hen, Minister of Defence for the Republic of Singapore: "These new submarines are the products of years of experience and deep expertise from both Germany and Singapore. They are a testament to our warm and growing defence ties with Germany. Closely collaborating with our Defence Science and Technology Agency (DSTA), the RSN oversaw the design of the submarines, before jointly developing them with thyssenkrupp Marine Systems. I am heartened by the cooperation and efforts of the Singaporean and German industries."

Dr. Rolf Wirtz, CEO of thyssenkrupp Marine Systems: "We are proud to be able to take this important step in the life of a boat together with our Singaporean partners. This first boat of the Type 218SG will mark a next generation of submarines. They will possess an extensive range of vital capabilities and therewith become a highly capable strategic asset for Singapore and its Navy."

Invincible is the first in a series of four boats of the Type 218SG. The contract for the first two submarines was signed in 2013 and the contract for the second batch in 2017. After handing over the Invincible in 2021, the second submarine is scheduled to be delivered in 2022. The third and fourth submarines are scheduled to follow from 2024 onwards.

The boats have the design of a low-signature submarine with air independent propulsion – enabling them to stay submerged for a longer period – and numerous tailor-made solutions and new technologies.

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### **DSTA and thyssenkrupp Marine Systems dive into additive manufacturing for submarines**

Prior to the launch of the Republic of Singapore Navy's first Invincible-class submarine, Singapore's Defence Science and Technology Agency (DSTA) and thyssenkrupp Marine Systems signed a Memorandum of Understanding (MOU) in Kiel to collaborate on new technologies such as additive manufacturing and data analytics for naval applications.

Under the agreement, DSTA and thyssenkrupp Marine Systems will explore the use of additive manufacturing as an innovative, cost-effective method for producing submarine spare parts. Both parties will work together on the design, engineering, and qualification of additive manufactured components, which could be tested and trialled on Singapore submarines.

Mr Tan Peng Yam, Chief Executive of DSTA: "In this age of rapid change, collaboration is key to exploit novel technologies. We are excited to combine our expertise with thyssenkrupp Marine Systems in additive manufacturing."

Dr Rolf Wirtz, CEO of thyssenkrupp Marine Systems: "This initiative is a prime example of our understanding of innovation: We are engineering. tomorrow. together. The MOU allows us to test parts manufactured in Kiel with additive manufacturing under real conditions. This is a great asset for us."

### **Key data for the Type 218SG Submarine**

Length over all: approx. 70 m

Displacement: approx. 2,000 t

Complement: 28

Propulsion: Diesel-electric plus AIP

#### About the Defence Science and Technology Agency

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The Defence Science and Technology Agency (DSTA), a statutory board under Singapore's Ministry of Defence, exploits science and technology, and provides technological and engineering support for Singapore's defence and security. It delivers leading-edge technological solutions to the Singapore Armed Forces (SAF) by tapping the best technologies and fostering an environment of innovation for defence applications. Its role spans the entire spectrum of capability planning, development, and sustainment of weapon systems throughout their life cycle to ensure that the SAF continue to be a formidable fighting force.

Visit [www.dsta.gov.sg](http://www.dsta.gov.sg) for more information.

#### About thyssenkrupp Marine Systems

thyssenkrupp Marine Systems is one of the world's leading system suppliers for submarines and naval surface vessels. The company has a history of naval shipbuilding that dates back centuries and offers state-of-the-art technologies, innovations and extensive and dependable services to customers around the world.

More information at: [www.thyssenkrupp-marinesystems.com](http://www.thyssenkrupp-marinesystems.com)

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