

# Made in Singapore

The Singapore economy has largely been driven by the twin engines of manufacturing and services. At its peak, Singapore's manufacturing sector made up 28.5 per cent of its gross domestic product (GDP) in 2004.

While manufacturing's share of GDP dipped below 20 per cent in 2013 to 2016, coinciding with the growth of manufacturing powerhouses in the region, the sector has defied analysts' forecasts that its role in the economy will shrink.

Instead, Singapore shifted its focus to advanced manufacturing, where companies use innovative technologies like data analytics to make

the manufacturing process more efficient and to ramp up output of high-value goods.

The strategy is to look towards complex, low-volume, high-mix products. Manufacturing has since bounced back. Last year, the sector's share of GDP rose to 22 per cent, from 20.1 per cent in 2017.

To commemorate Singapore's 54th birthday, *The Business Times* celebrates some of the nation's manufacturing achievements.

— BY CLAUDIA TAN



## SC NEUSTAR

Made by SC Auto

Developed over a period of three years, SC Neustar was the first bus that was fully designed and built in Singapore. This allowed SC Auto to shift from being a builder of bus bodies to an Original Equipment Manufacturer (OEM). Being an OEM opens the way for the company to build its own products from start to finish. The new model of the bus costs S\$6 million to develop, and is the culmination of the company's S\$60 million investment into its manufacturing capabilities. The commercial sets have since hit the roads in Singapore and Myanmar, promising higher fuel efficiency from the lightweight design.



## GE9X ENGINE COMPONENTS

Made by General Electric

In 2018, GE Aviation announced a S\$42 million investment in its Seletar Aerospace Park facility to manufacture components for the high pressure compressor section of the GE9X aircraft engine, which helps guide airflow. Singapore will be the only place in the region with the capabilities to manufacture these engine components. The GE9X currently holds the world record for most powerful jet engine and is the only engine used to power the Boeing 777X aircraft.

## MINISEQ SYSTEM

Made by Illumina

Illumina's manufacturing site in Singapore is the only facility that manufactures its full suite of products ranging from instruments to consumables. Its products are used in areas of life sciences, oncology, reproductive health, agriculture and other emerging segments. Among these products is the MiniSeq System, a sequencing machine used to sequence DNA for public health and disease studies. Launched in 2016, the system was innovated and designed by Singaporean and American engineers, and was subsequently manufactured locally.



## HILLI EPISEYO

Made by Keppel Offshore & Marine (Keppel O&M)

Keppel O&M delivered the world's first converted floating liquefaction vessel (FLNGV) for Golar Hilli Corporation in 2017. The project, worth some US\$1.2 billion (S\$1.66 billion), offers oil and gas companies greater potential sources out at sea. The greater flexibility to produce, liquefy, store and transfer natural gas closer to the source makes the FLNGV a viable solution to access remote and marginal gas fields. This is unlike the traditional means of liquefaction of natural gas at purpose-built onshore plants where long pipelines have to be constructed to get the gas to the closest facility, a process that is more expensive, harmful to the environment and limited by the distance to shore.

## ADVARA MRI SURESCAN PACEMAKER

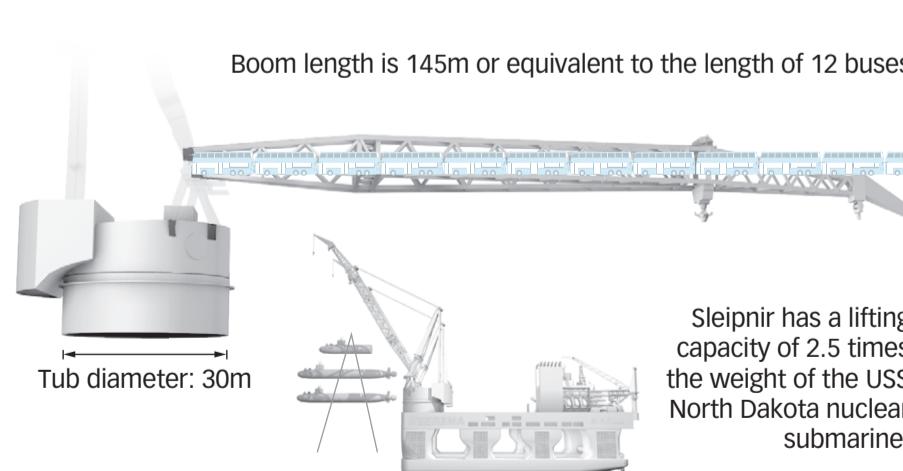
Made by Medtronic Singapore Operations (MSO)

MSO was established in Changi South in 2009 as the first cardiac device manufacturing facility for Medtronic in Asia Pacific. Singapore's strong intellectual property laws, global connectivity and skilled workforce were some factors that made it a choice location for the S\$80 million manufacturing facility. Among MSO products manufactured locally, the Advisa MRI SureScan Pacemaker is a small device that helps heart patients prevent sudden cardiac deaths by monitoring their heart rhythms. When it detects an abnormal rhythm, it delivers an electric shock to restore normal heartbeat.



## BALLASTING SYSTEM

Sleipnir rides below the water for stability when lifting extremely heavy loads, and rise far above the waves when traversing the vast oceans by taking in or releasing sea water to adjust its height.

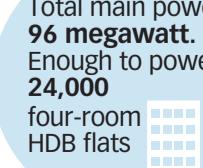


## FACTS & FIGURES

900,000 sqm of paint used, enough to cover the entire Singapore Botanic Gardens



Total main power 96 megawatt. Enough to power 24,000 four-room HDB flats



95,000 tonnes of steel used, enough to build 1.5 Empire State buildings



The 220m x 102m deck is wider than three soccer fields 22,440 sqm



3,000km of cables used, about the distance from Singapore to Nagoya, Japan

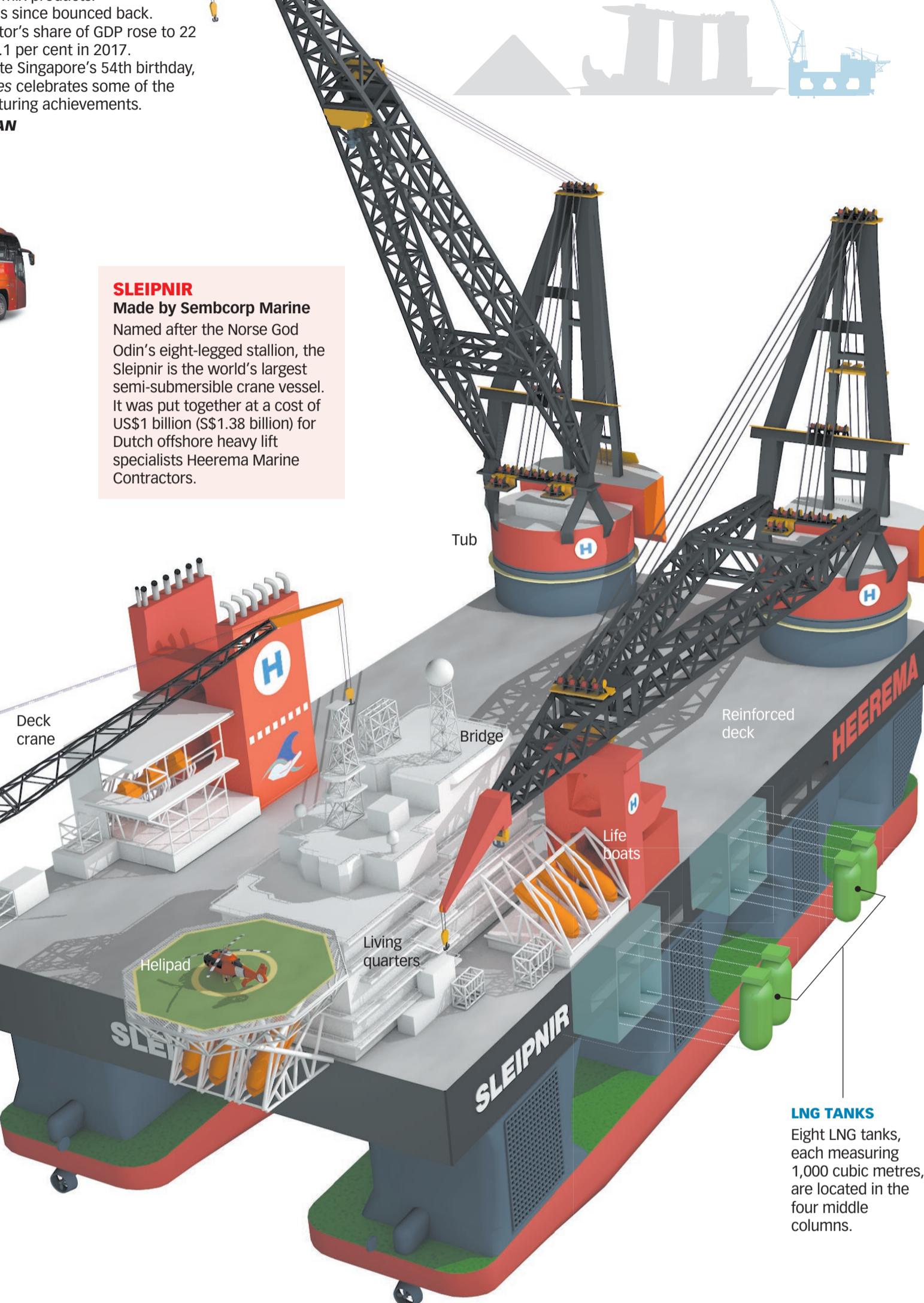


## HEIGHT COMPARISON

Great Pyramid of Giza 138.8m

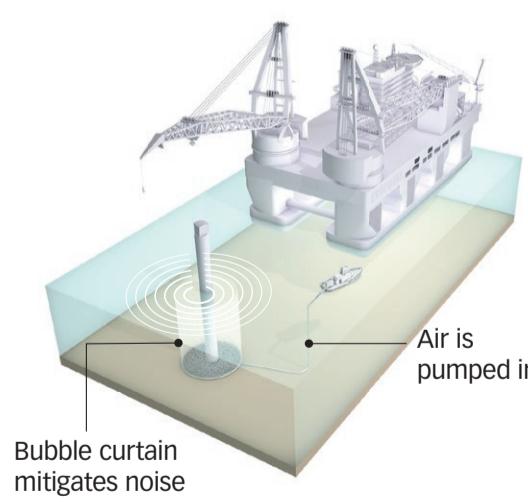
Marina Bay Sands 200m

Sleipnir 220m



## GREEN FEATURE

Use of underwater bubble curtains (below) to lower the noise level generated by under water hammers during pile driving in order to protect sealife.



Boom length is 145m or equivalent to the length of 12 buses

Sleipnir has a lifting capacity of 2.5 times the weight of the USS North Dakota nuclear submarine.

Bubble curtain mitigates noise

The 220m x 102m deck is wider than three soccer fields 22,440 sqm

