



# AURORA SPIRIT: Shuttle tanker

Shipbuilder: ..... **Samsung Heavy Industries**  
 Vessel's name: ..... **Aurora Spirit**  
 Owner/Operator: ..... **Teekay Offshore**  
 Country: ..... **Bermuda**  
 Designer: ..... **Samsung Heavy Industries**  
 Country: ..... **Republic of Korea**  
 Model test establishment used: ..... **Samsung Ship Model Basin**  
 Flag: ..... **NIS**  
 IMO number: ..... **9837169**  
 Total number of sister ships already completed (excluding ship presented): ..... **Nil**  
 Total number of sister ships still on order: ..... **3**

Described by its owner Teekay Offshore as one the most environmentally friendly shuttle tankers ever built, *Aurora Spirit* was launched in March 2019 as the first of a four-ship series. Two further ships in the E-Shuttle series – *Rainbow Spirit* and *Tide Spirit* – have also been launched with a fourth under construction at Samsung's Geoje yard.

With a deadweight of 128,800tonnes and a length oa of 277m, *Aurora Spirit* falls approximately in the middle of Teekay Offshore's fleet in terms of size. But it's the ship's power and propulsion systems which are its claim to significance. The ship has a hybrid propulsion system with Corvus batteries and a diesel-electric power plant configured around Wärtsilä 34DF engines. The propulsion system comprises four Wärtsilä electric motors each rated at 3,800kW connected in twos through a pair of Brunvoll reduction gearboxes to twin Brunvoll thrusters for a service speed of 14.5knots.

It is planned to run the engines mostly on LNG, however, the ships will also utilise Wärtsilä's innovative VOC recovery and liquefaction system, which will mix the VOCs with the LNG to be used as fuel. It is anticipated that CO<sub>2</sub> equivalents are cut by more than 40%, compared to conventional shuttle tankers. NOx emissions will be cut by more than 80%, SOx emissions will be virtually nil and particulate emissions will be reduced by more than 95%.

## TECHNICAL PARTICULARS

Length oa: ..... Approx. 277m  
 Length bp: ..... 265.0m  
 Breadth moulded: ..... 46.0m  
 Depth moulded  
 to upper deck: ..... 23.4m  
 Width of double skin  
 side: ..... 3.0m  
 bottom: ..... 3.0m  
 Draught  
 scantling: ..... 15.4m  
 design: ..... 15.0m  
 Displacement: ..... 156,300t  
 Lightweight: ..... 32,000t  
 Deadweight  
 scantling: ..... 128,800t  
 design: ..... 124,300t  
 Block co-efficient: ..... 0.84 at design draught  
 Speed, service (–%MCR output): ..... 14.5knots

Incl. 15% power margin (91% of MPP)  
 Cargo capacity  
 Liquid volume: ..... 141,200m<sup>3</sup>  
 Bunkers  
 LNG Fuel: ..... 2,000m<sup>3</sup>  
 Diesel oil: ..... 3,300m<sup>3</sup>  
 Water ballast: ..... 60,000m<sup>3</sup>  
 Tankers – percentage segregated ballast: ..... 100%  
 Daily fuel consumption (tonnes/day): ..... 72.0t per day at NPP with hotel load

Classification society and notations:..... DNV GL  
 X1A, Tanker for oil, ESP, CSR, E0, BIS, TMON, DYNPOS(AUTR), BWM(E[s], T), Clean(Design), NAUT(AW), Bow loading, VCS(2B, 3), F(A,M,C), Plus, CSA(FLS2), COMF(V-3, C-3), CCO, ESV(DP, HIL-IS), ECA(SOx-A), COAT-PPSPC(B, C), RP(2, 50), Recyclable, SPM(except for 4.2.2 regarding the distance of fairlead), HMON(A1, B, C1, G4), LCS, HELDK(S, H, CAA-N), Battery(Safety), Gas fuelled, BMON  
 % high-tensile steel used in construction: ..... Approx. 55%

Propulsion  
 Design: ..... El. motor propulsion  
 Model: ..... MDH-08008B-J088F  
 Manufacturer: ..... Wärtsilä  
 Number: ..... 4  
 Type of fuel: ..... Electric power  
 Output of each propulsion motor: ..... 3,800kW  
 Is this a diesel-electric or hybrid?: ..... No  
 Gearbox(es)  
 Make: ..... Brunvoll  
 Model: ..... AG TS 1400  
 Number: ..... 2  
 Output speed : ..... 85.3rpm  
 Propeller(s)  
 Material: ..... Ni-Al-Bronze  
 Designer/Manufacturer : ..... Brunvoll  
 Number: ..... 2  
 Fixed/Controllable pitch: ..... Controllable  
 Diameter: ..... 6.9m  
 Speed: ..... 85.3rpm at NPP

Diesel-driven alternators  
 Alternator make/type: ..... Wärtsilä / GNH-07110A-P108N & GNH-08012A-P108N  
 Output/speed of each set: ..... 2 x 4,611kVA + 2 x 6,144kVA / 720rpm

Boilers  
 Number: ..... 2  
 Type: ..... OL  
 Make: ..... Aalborg  
 Output, each boiler: ..... 25,000kg/h  
 Stern appendages/rudders:.... Full spade rudder  
 Bow thruster(s)  
 Make: ..... Brunvoll  
 Number: ..... 2 azimuths, 1 tunnel thruster  
 Output (each): ..... 2,200kW  
 Stern thruster(s)

Make: ..... Brunvoll  
 Number: ..... 1 azimuth  
 Output (each): ..... 2,200kW  
 Deck machinery  
 Cargo cranes/cargo gear  
 Number: ..... 2  
 Make: ..... SSII  
 Type: ..... High pressure, electro-hydraulic self-contained, single jib type  
 Performance: ..... 15.0t SWL, each  
 Other cranes  
 Number: ..... 2  
 Make: ..... SSII  
 Type: ..... High pressure, electro-hydraulic self-contained, single jib type  
 Tasks: ...Engine room equipment handling  
 Performance: ..... 8.0tons SWL, each  
 Mooring equipment  
 Number: ..... Two (2) - 1 C/L + 2 M/D + 1 W/H, each, Six (6) - 2 M/D + 1 W/H, each  
 Make: ..... MacGregor  
 Type: High pressure, electro-hydraulic driven  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1x 36 persons  
 Make: ..... Norsafe  
 Type: ..... Totally enclosed free-fall type  
 Cargo tanks  
 Number: ..... 12  
 Grades of cargo carried: ..... 2 segregations  
 Product range: ..... Crude oil  
 Coated tanks – make and type: ..... Jotun, Epoxy  
 A/C according to PSPC  
 Cargo pumps  
 Number: ..... 4  
 Type: ..... Centrifugal, electric motor driven  
 Make: ..... Wärtsilä  
 Capacity (each): ..... 3,000m<sup>3</sup>/h x 135m at S.G 1.025  
 Cargo control system  
 Make: ..... Scana  
 Type: ..... Hydraulic type valve remote control  
 Ballast control system  
 Make: ..... Scana  
 Type: ..... Hydraulic type valve remote control  
 Ballast water treatment system  
 Make: ..... Alfa Laval  
 Capacity: ..... 3,000m<sup>3</sup>/h x 2 sets  
 Complement  
 Officers: ..... 17 persons  
 Crew: ..... 13 persons  
 Suez/Repair Crew: ..... 6 persons  
 Single/double/other rooms: ..... 30 cabins (single), 3 cabins (1 double)  
 Bridge control system  
 Make: ..... Brunvoll  
 Is bridge fitted for one-man operation? ..... Yes  
 Integrated bridge system: ..... Yes  
 If yes, make: ..... Furuno  
 Model: ..... FMD-3300 and etc.  
 Radars  
 Number: ..... 3  
 Make: ..... Furuno  
 Model(s): ..... 1 x FAR-3330S-SSD + 2 x FAR-3320  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Fire Alarm System CCP  
 Fire extinguishing systems  
 Engine room:  
 Make/Type:Survitec / high expansion foam  
 Cabins:  
 Make/Type: ..... Fire hydrants  
 Public spaces:  
 Make/Type: ..... Fire hydrants  
 Waste disposal plant  
 Incinerator  
 Make: Teamtec ..... Model: GS900CRSX  
 Efficiency  
 Installed Fuel Meters: ..... Mass flow  
 Other installed monitoring tools: ..... Ship performance monitoring system  
 Energy Saving Technologies\*: ..... Rudder bulb, LNG fuelled, battery (2 x 309 kWh), LED (E/R, accommodation and etc.), VFD (propulsion motors, thrusters), Multi-VFD (IGG CSW pumps / ballast pumps / cargo oil/ cargo stripping / Ref. compressor)  
 Contract date: ..... 25 August 2017  
 Launch/float-out date: ..... 20 March 2019  
 Delivery date: ..... November 2019

