Editor: Richard Halfhide

Editorial Assistant: Sophie Collingwood Production Manager: Nicola Stuart

Advertisement Production Manager: Stephen Bell Subscriptions & Publications Manager: Tasharna Francis

Publisher: Dmitriy Ponkratov

Advertising Sales: J P Media Services

Email advertising: jpayten@jpmediaservices.com

**Telephone:** +44 (0)1737 852135

Published by:

The Royal Institution of Naval Architects Editorial Office: 8-9 Northumberland Street

London, WC2N 5DA, UK Telephone: +44 (0) 20 7235 4622 Telefax: +44 (0) 20 7245 6959

E-mail editorial: editorial@rina.org.uk E-mail production: production@rina.org.uk E-mail subscriptions: subscriptions@rina.org.uk

Printed in Wales by Stephens & George Magazines.

The Institution is not, as a body, responsible for opinions expressed in *The Naval Architect* unless it is expressly stated that these are the Council's views.

Registered charity No. 211161

© 2020 The Royal Institution of Naval Architects. This publication is copyright under the Berne Convention and the International Copyright Convention. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted without the prior permission of the copyright owner. Permission is not, however, required to copy abstracts of papers or of articles on condition that a full reference to the source is shown. Multiple copying of the contents without permission is always illegal.

A 2020 subscription to The Naval Architect costs:

NAVAL ARCHITECT (10 issues per year)

12 months	Print only†	Digital Only*	Print + Digital
UK	£203	£203	£259
Rest of Europe	£213	£203	£268
Rest of World	£228	£203	£284
†Incudes p+p			

\*Inclusive of VAT

The Naval Architect Group (English Edition) Average Net Circulation 9,942 (total) 1 January to 31 December 2019 ISSN 0306 0209





# 6

World's largest LNG bunkering vessel delivered

## 7 Editorial comment

Equality should matter to maritime

## 8-15 **News**

8-10 News

12 News Analysis

14-15 Equipment News

## 16-43 **In-depth**

16 China Ship News | World's largest LNG bunkering vessel launches in China

18-19 **Japan** | Japanese joint project explores shipping's road to 2050

40 Research | Maritime Research and Innovation UK

41-43 **Green ships** | What does it mean to be a retrofit ship of the future?

## 45 Diary





47

Retrofitting for shipping's green future

## 20-39 Features

### Feature 1 Engines & propulsion

- 20 Wärtsilä led consortium combines technologies for fuel efficiency
- 22-25 How much is enough? EEDI rules and 'minimum propulsion power'

#### Feature 2 Container ships

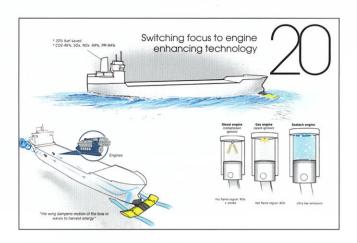
- 26-28 Container lashing: taking the strain for a bigger problem
- 29-31 Ultimate strength performance of a damaged container ship

#### Feature 3 Classification & regulation

- 32-33 Six months on: has shipping met the mark with the IMO 2020 0.50% sulphur fuel switchover?
  - 34 CSR software updates support industry for vessel design
  - 35 Innovation in the age of Covid-19
- 36-37 Ammonia: the good, the bad, and the unknown

#### **Feature 4 Communications**

- 38 It's time for a change of mindset on cyber risk compliance
- 39 Standalone navigation alternatives are vital to ship safety





#### **Digital Editions**

*The Naval Architect* is published in print and digital editions. The current and archived digital editions may be read on PC, iPad or other touchpad.

Visit http: www//rina.org.uk/Naval-architect-digital.html to read the digital editions, or download the free RINA Publications App.

