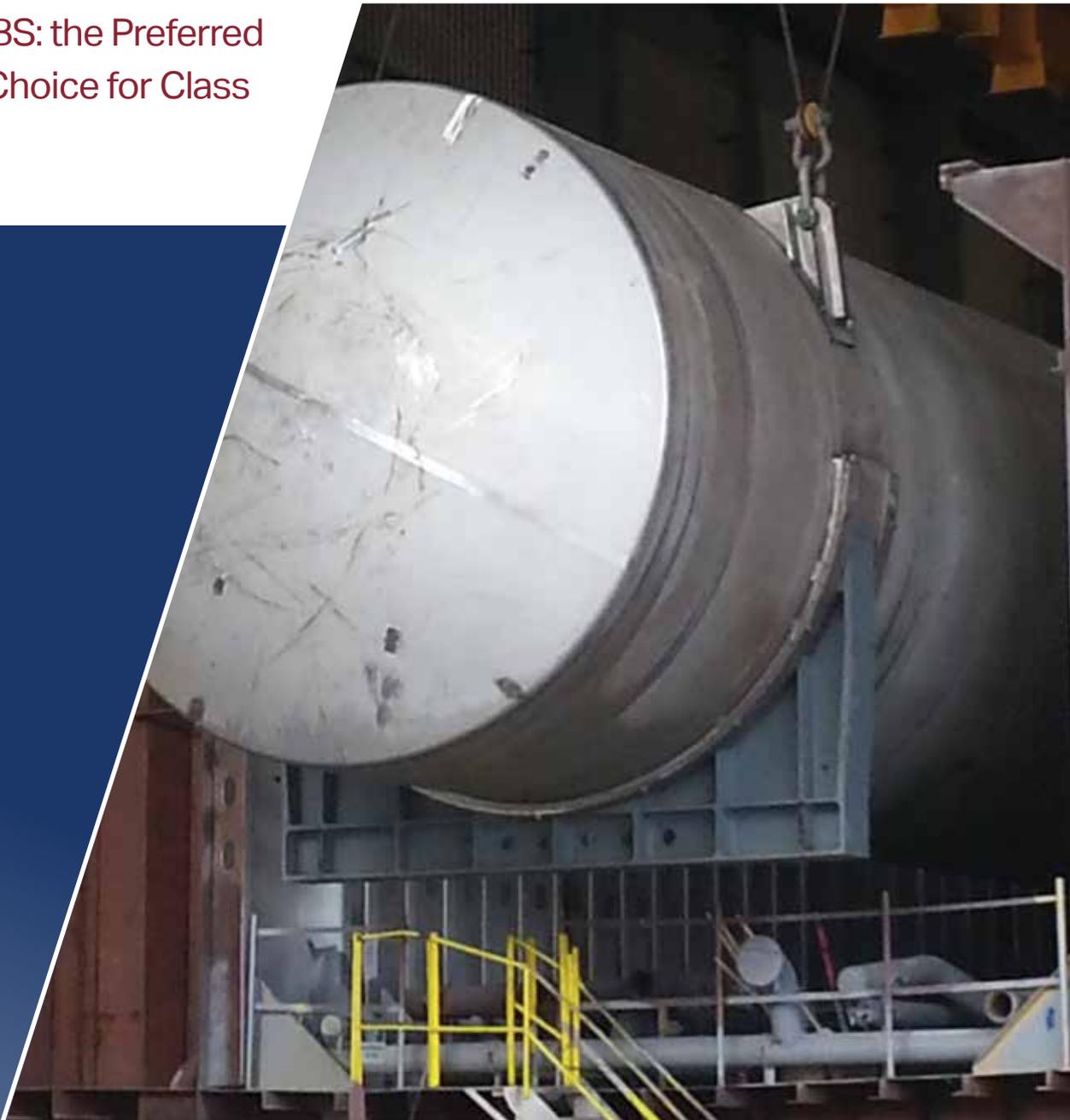


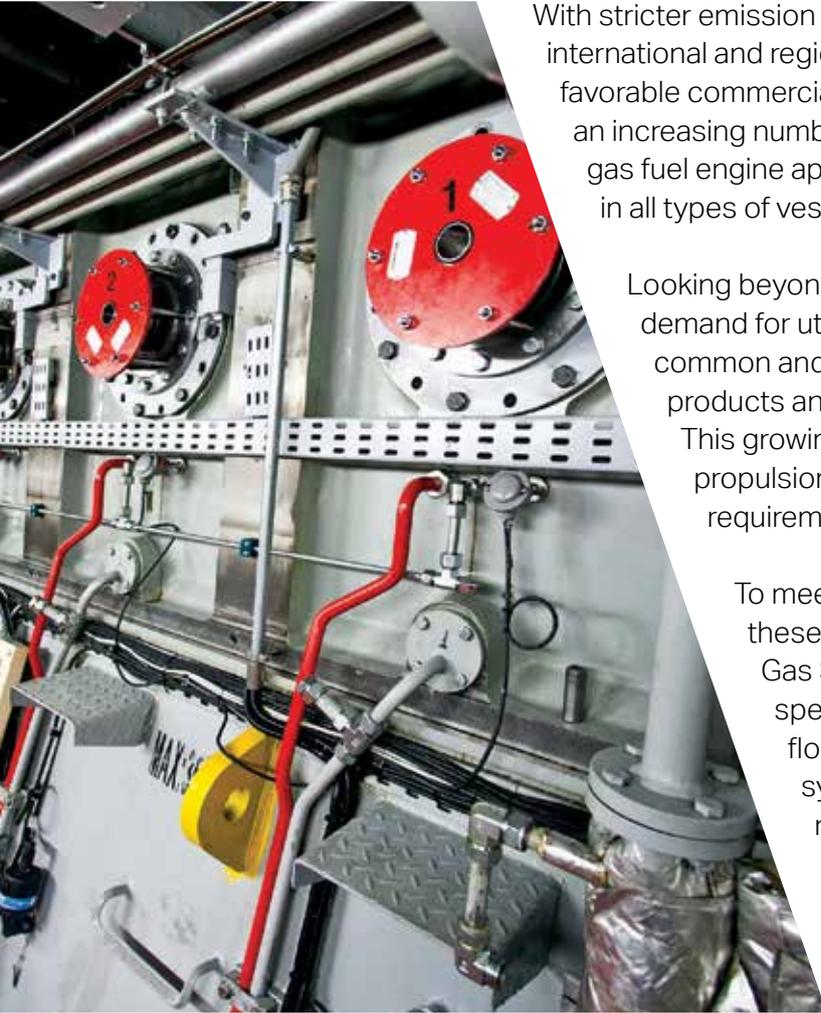


Gas Fueled Ships

ABS: the Preferred
Choice for Class



A New Breed of Vessel



With stricter emission requirements implemented through international and regional air quality controls, along with favorable commercial conditions for the use of natural gas, an increasing number of dual fuel diesel engine and single gas fuel engine applications are being considered for use in all types of vessels.

Looking beyond liquefied natural gas (LNG) carriers, demand for utilizing alternative fuels is becoming more common and marine designers are creating new products and systems with this capability in mind. This growing breed of vessels has little or no marine propulsion experience and few existing regulatory requirements.

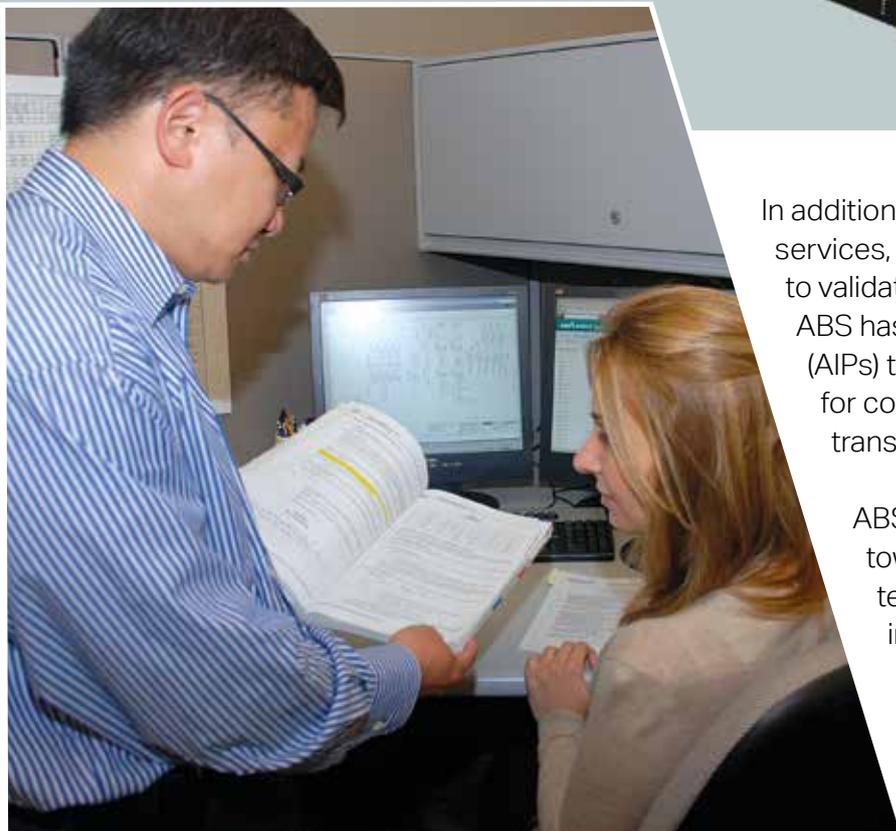
To meet the demand of owners developing these vessels, ABS has formed its Global Gas Solutions team, bringing together gas specialists with extensive knowledge of LNG floating structures and systems, gas fuel systems and equipment, gas carriers, and regulatory and statutory requirements. ABS' experience with gas fueled ship projects includes existing vessels converting to gas fuel, as well as the new generation of gas fueled vessels.



Experienced to Guide Preliminary Plans



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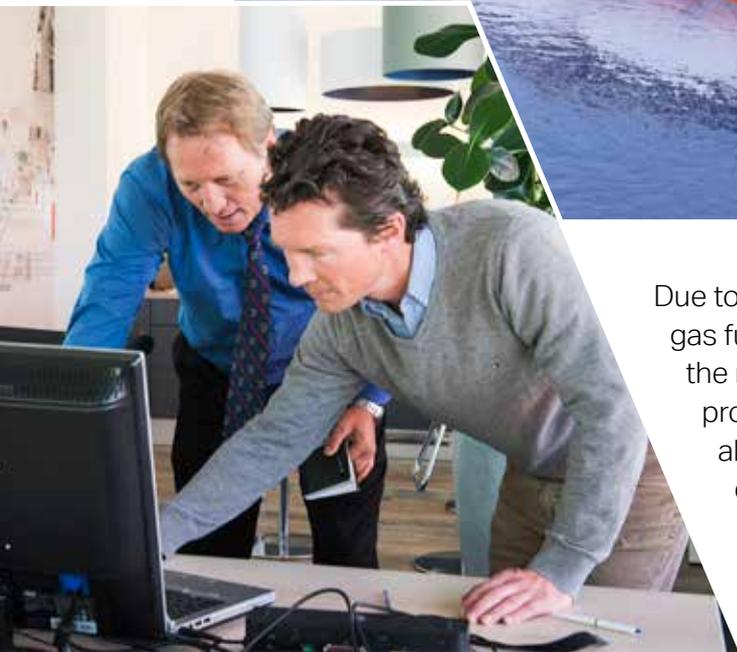


In addition to traditional classification services, the maritime industry turns to ABS to validate new and novel gas concepts. ABS has provided approvals in principle (AIPs) to numerous concepts designed for containment, transfer, storage or transport of LNG and natural gas.

ABS takes a collaborative approach toward addressing gas fueled ship technology issues by working in close cooperation with governments, academia and the marine industry. Research and development partnerships are formed to advance technology innovation.

ABS can provide preliminary planning and advice (PPA) services during pre-sanctioned front-end engineering and design (FEED) phases, through onsite meetings and the review of the design. By involving class at this very early stage before detailed plans are drawn or concepts selected, ABS can assist in technology assessments and preliminary risk assessments. It can also facilitate discussions with regulatory bodies to provide a technical evaluation of the basic design concept being proposed, including, when required, approval in principle.

Research for Novel Gas Concepts



Due to the fast pace of technology in the gas fueled ship market, ABS recognizes the need for designers and owners to propose novel designs that include alternative means of compliance to existing Rules and regulations.

Typically, for the unique elements within a new gas fueled ship project, the use of risk analysis and special studies are employed.

ABS has extensive experience facilitating hazard identification (HAZIDs) and hazard and operability (HAZOPs) studies for clients. In addition, new and novel concept design reviews and the granting of an AIP can be facilitated through ABS Engineering offices located around the world.

A number of publications are referred to for gas fueled ship concepts and system designs, including the *ABS Guide for Propulsion and Auxiliary Systems for Gas Fueled Ships* and international standards such as the IMO's *Interim Guidelines on Safety for Natural Gas-Fueled Engine Installations in Ships*.

Respected Industry Leadership

ABS provided the first classification services to the gas industry more than 50 years ago. It has remained a leading class provider ever since, assisting clients in meeting the many technical challenges that have arisen in the gas fueled ship industry, including the certification and classification of the first LNG powered offshore support vessel (OSV) for US flag.

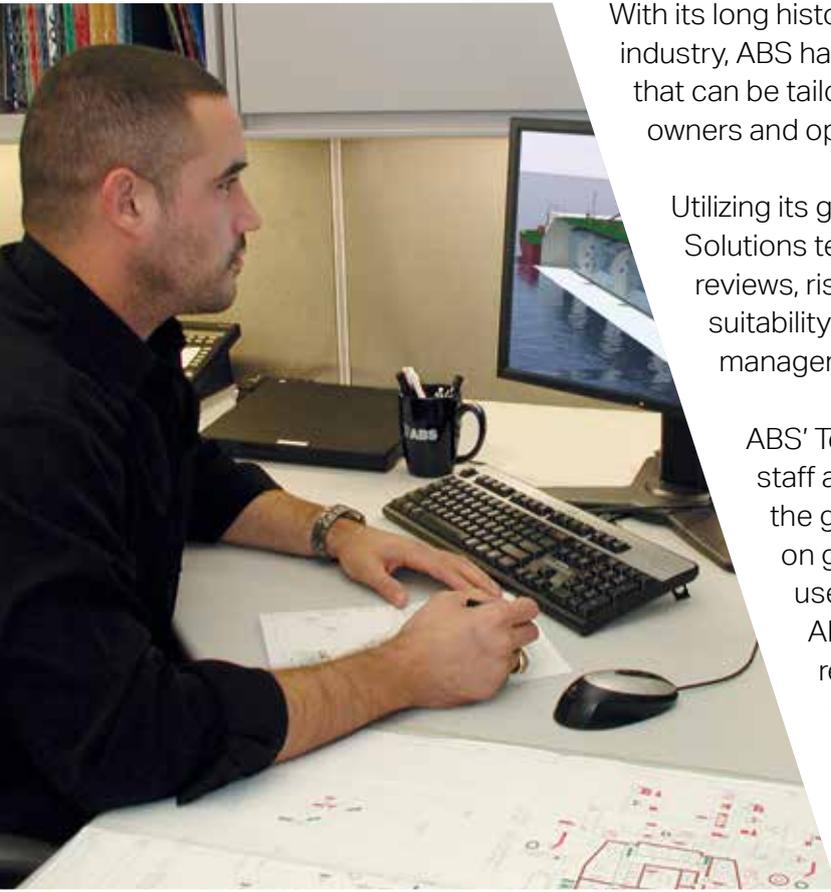
ABS plays a leading role amongst classification societies in contributing to the development of the IMO's International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code), and the US Coast Guard's Chemical Transportation Advisory Committee (CTAC) recommendations on safety standards for the design of vessels carrying natural gas or using natural gas as fuels.

ABS is a founding associate member of the Society for Gas as a Marine Fuel (SGMF) and also is a member of the Center for Liquefied Natural Gas.



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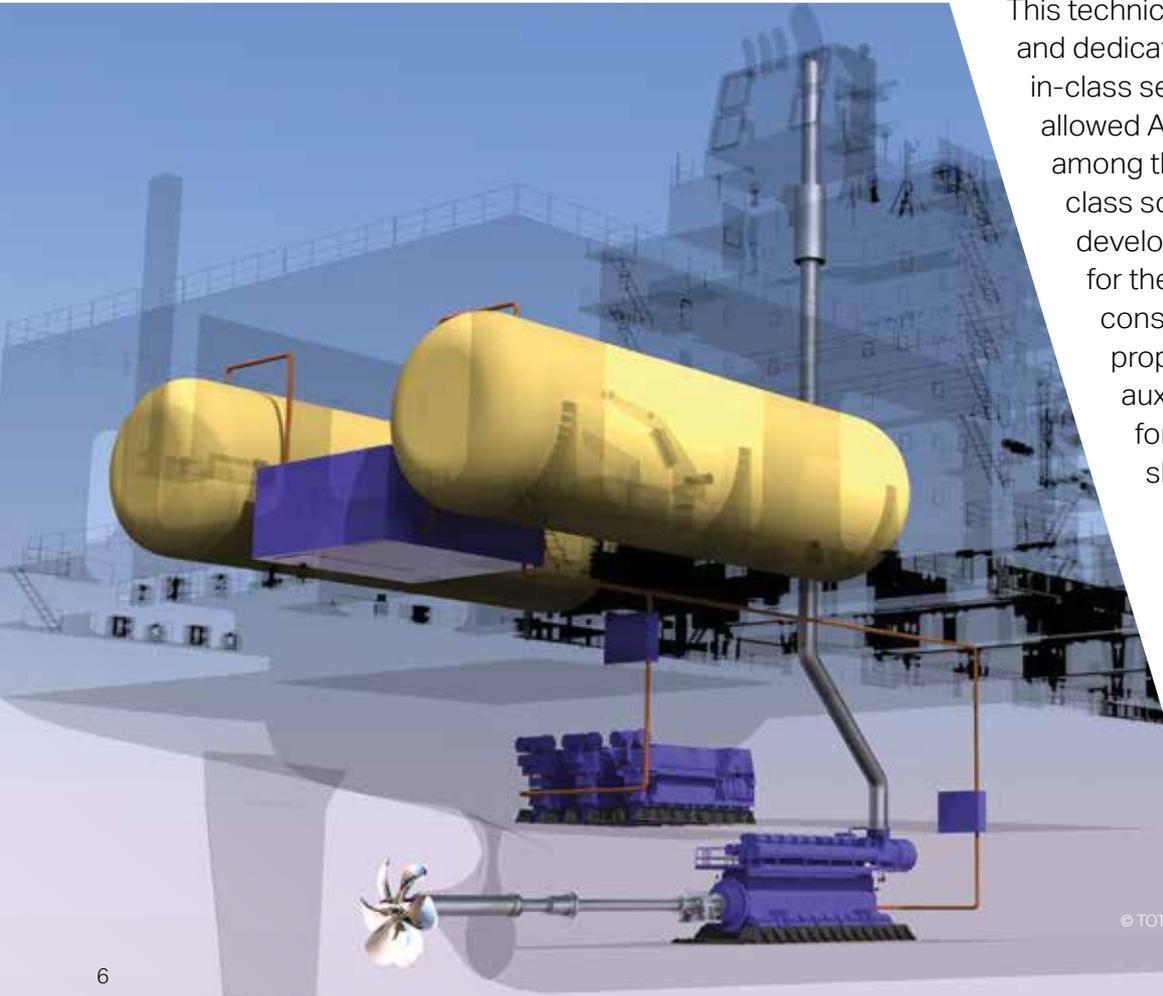
Setting the Standard for Excellence



With its long history of service excellence in the marine industry, ABS has established a service delivery system that can be tailored to meet the specific needs of owners and operators of gas fueled ships.

Utilizing its global experience, the Global Gas Solutions team assists clients with specification reviews, risk and hazard assessments, bunkering suitability reviews, new construction project management and training.

ABS' Technology department has a dedicated staff addressing technical issues surrounding the gas fuel ship industry, from guidance on gas dispersion assessments to the use of novel alternative fuel systems. ABS Technology takes a leading role in research and development discussions when looking at emerging gas technologies and provides practical guidelines and solutions to the marine industry.



This technical leadership and dedication to best-in-class service has allowed ABS to be among the first of the class societies to develop guidance for the design and construction of propulsion and auxiliary systems for gas fueled ships.

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Global Reach, Local Touch

ABS maintains Engineering offices in multiple locations, including Korea, Japan, China, Greece, the United Kingdom and the United States, to facilitate the design review of gas fueled vessels on order to ABS class. Experienced professionals provide technical support and assistance to clients from the initial design concept, through the design approval process, during construction and throughout the entire service life of the vessel.

ABS also offers a comprehensive training program that is used both within ABS and provided to clients around the world. Through the ABS Academy, ABS offers specialized training courses addressing major concerns, as well as the design and approval process of gas fueled ship classification.

The industry training programs offered by ABS Academy, combined with the services of the Global Gas Solutions team and the network of experienced surveyors specifically trained and qualified in surveying gas fueled ships, has led ABS to further strengthen its leadership role in marine classification.





ABS offers a comprehensive range of classification and related services to designers, builders, owners and operators of gas fueled ships. The principal elements of the ABS Gas Fueled Ship program have been summarized. More complete details can be obtained from an account representative at the nearest ABS office.

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