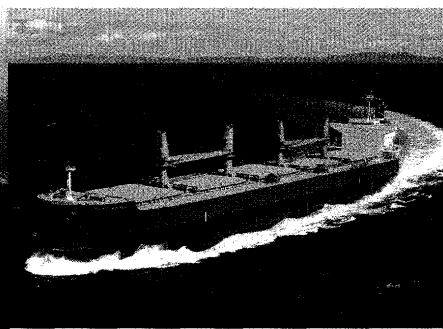


## Okayama

### MES Tamano Works – A world leader in marine products



Top: NORD ANGEL; Bottom: HAIMA.

MES Tamano Works.

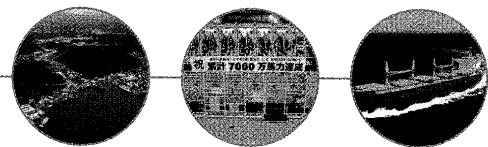
**T**he Tamano Works of Mitsui Engineering & Shipbuilding Co., Ltd. is the largest manufacturer of slow speed marine diesel engines in Japan and a leading shipbuilder. Located on the coast of Okayama Prefecture in western Japan half way between Osaka and Hiroshima, the Tamano Works is a large complex that faces the Seto Inland Sea south of Okayama City. It was originally established in 1917 as the shipbuilding department of what is now known as Mitsui & Co., Ltd. After a number of reorganizations over the years, the company changed its English name to Mitsui Engineering & Shipbuilding Co., Ltd. (MES) in 1976.

The Tamano Works is one of the main manufacturing centers of MES, which together with the MES Group of companies, is a leading global provider of maritime products ranging from ships, engines, and systems to infrastructure and environmental solutions of all sorts. It currently consists of several groups, including the Ship - Ocean - Underwater Equipment Group, the Machinery Group, the Technoservice Group, and the Research & Development Group, among others. The company provides an extensive range of products and services such as the repair and construction

of commercial ships, naval ships and craft, patrol vessels, research, training and other types of specialized vessels, as well as the manufacture of slow-speed and medium-speed diesel engines, turbochargers, turbines, power generators, and various types of marine and other systems. Total consolidated sales for the whole MES group exceeded US \$9 billion in 2009.

The company has achieved many firsts over the years, including completing the first diesel cargo ship to be built in Japan in 1924 (the *Akagisan Maru*), building the world's first low-temperature LPG carrier in 1961 (the *Gohshu Maru* - classed with NK), the world's first automated cargo ship (the *Kinkasan Maru* - also classed with NK) that same year, as well as the world's first offshore oil drilling rig for exclusive use in frozen seas in 1983, and an unmanned, remote controlled deep sea research vehicle in 1995 (the *Kaiko*) that succeeded in diving to a depth of 10,911 meters - a world record as of 1995.

Other ships built by the Tamano Works include specialized vessels like the *Chikyu*, a deep-sea scientific riser drilling vessel that was launched for the Japan Marine Science and



Technology Center in 2002 (see the 54th Edition (2002) and 60th Edition (2008) of ClassNK Magazine for details), as well as the MV Haima, a 110,046 dwt oil tanker built to NK class and delivered in 2009 (see the 2009 ClassNK Annual Report, p.17), as well as the MV Nord Angel, a 56,000 dwt type bulk carrier, delivered in April 2010, also built to NK class. This ship is the 102nd of the "Mitsui 56" series delivered by the Tamano Works since the series was first introduced to the market in 2001 and the first ship delivered in 2003. The ship is a 56,000 dwt handy-max type bulk carrier with a very large cargo hold capacity exceeding 70,000 m<sup>3</sup>. In addition to flexible cargo handling capabilities, each ship is also equipped with a MITSUI-MAN B&W diesel engine as its main engine, which is a light, compact and high output engine with excellent reliability and high operational flexibility. A total of some 160 vessels of this series are expected to have been delivered to clients around the world, with the bulk of these ships being built to NK class.

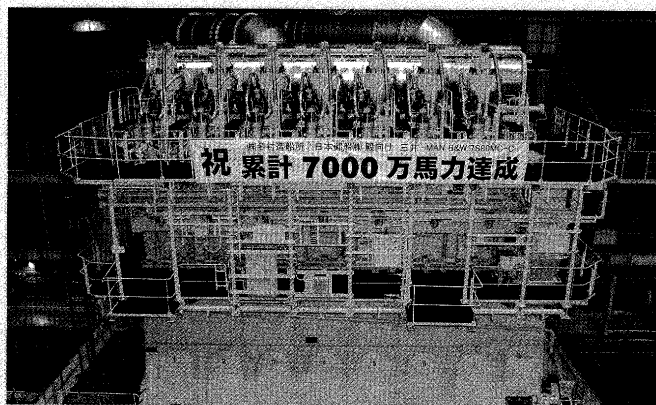
The Tamano Works is especially known for its production of marine diesel and other types of engines and related systems. Since concluding a licensing agreement with Burmeister & Wain of Denmark in 1926, the Tamano Works has grown steadily over the years to become an all-round builder of diesel engines and supplier of components for both marine and land units. The Tamano Works currently manufactures nearly half of all slow-speed marine diesel engines produced in Japan, making it a preeminent leader in marine engine technology and production. This has been aided by the expansion of the Tamano Machinery Factory at the Tamano Works in 2007, which established a framework

for the production of 5 million BHP of diesel engines annually. The plant is also the only engine production facility in Japan with its own shipping berth, greatly facilitating the delivery of engines up to 640 tons in weight without the need for disassembly.

In fact, the Tamano Works reached a major milestone on 2 June 2010 with the production of a 7S80MC-C / 27,160 KW x 76 RPM type main diesel engine which marked the plant's aggregate production of 70 million BHP since the plant completed its first engine in 1928, a world record for a single brand engine being built by a single builder. This engine was both certified by ClassNK and installed onboard a NK classed ship. To date, the plant shipped a total of nearly 5,000 diesel engines to clients around the world. A total of 230 engines (4.2 million BHP) are planned to be shipped during the April 2010 to March 2011 fiscal year, the bulk of which are scheduled to be installed onboard NK classed ships. The Tamano Works celebrated the accumulated production of 50 million BHP in 2005, reached 60 million BHP in 2008, and surpassed the 70 million milestone just a short two years later.

The R&D Division of the Tamano Works Research & Development Group is noted for its mission of leading and assisting in the development of technologies and products primarily in the field of advanced machinery systems. These include measurement and inspection technologies, process technologies, control technologies for machinery systems and plants, as well as advance computer simulation technologies such structural analysis and computational fluid dynamics analysis. A major goal of all these efforts is the development and production of reliable and eco-friendly systems and solutions that meet the needs of clients throughout the maritime world.

The various activities of the MES Tamano Works are prime examples of the firm's corporate philosophy of being a "manufacturing" company trusted by society and its people that is committed to the realization of a sustainable society, through the development and production of earth-friendly products with higher efficiency and lower energy consumption particularly in its main products: shipbuilding, diesel engines, and various marine systems and support services.



70 million BHP record breaking engine.