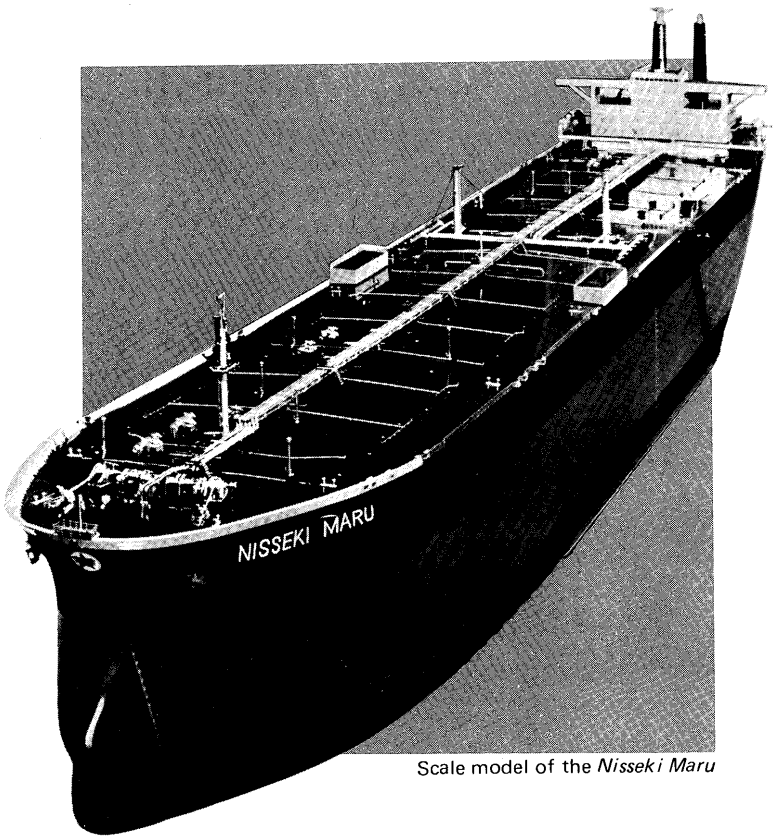
KEEL-LAYING OF 370,000-DWT-CLASS TANKER — MAXIMUM TANKER SIZE TRIPLES IN A DECADE

Twice the Size of a Soccer Field

On November 18, 1970, construction of the world's largest ship, a 372,400-ton-deadweight tanker, was begun at a shipyard on Japan's Inland Sea. This ship, to be christened the *Nisseki Maru*, is being built by Ishikawajima-Harima Heavy Industries Co., Ltd. at its Kure Works. The owner will be Tokyo Tanker Co., Ltd.

In September 1971, after a construction period of about 11 months, the *Nisseki Maru* will be completed. She will then be classed with the Society.

Her main particulars are compared with those of other Japanese-built supermammoth tankers in Table 1 and Figure 1.

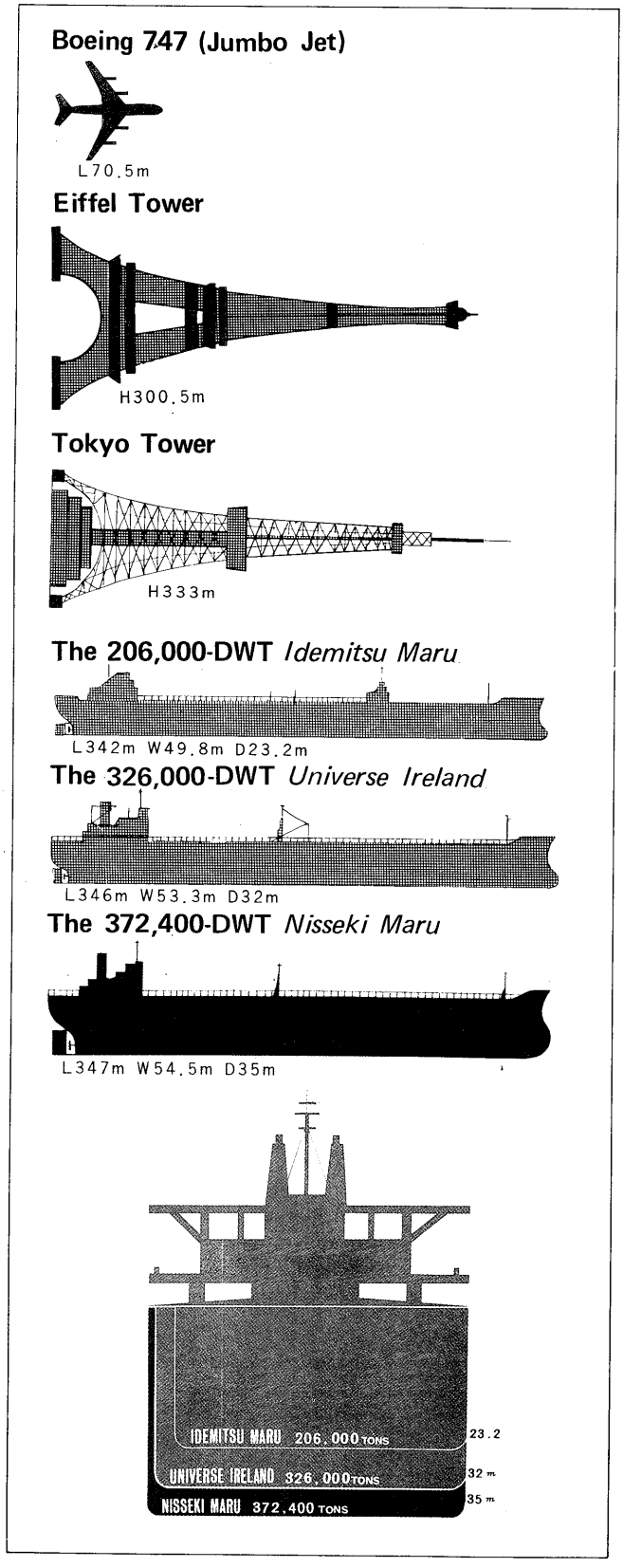


Scale model of the *Nisseki Maru*

Table 1. MAIN PARTICULARS OF NISSEKI MARU COMPARED WITH OTHER SHIPS

Name of Ship	*Nisseki Maru*	*Universe Ireland*	*Okinoshima Maru*	*Idemitsu Maru*	*Tokyo Maru*
Length (overall)	347.0 m	346.0 m	337.7 m	342.0 m	306.5 m
Length (p.p.)	330.0 m	330.0 m	320.0 m	326.0 m	290.0 m
Breadth (mld.)	54.5 m	53.0 m	53.6 m	49.8 m	47.5 m
Depth (mld.)	35.0 m	32.0 m	26.4 m	23.2 m	24.0 m
Draft	27.0 m	24.78 m	19.74 m	17.65 m	16.0 m
Gross Tonnage	186,500 t	149,608 t	130,841 t	107,957 t	94,630 t
Deadweight	372,400 t	326.585 t	254,773 t	206,005 t	153,685 t
Main Engine	Steam Turbine 40,000 HP	Steam Turbine 37,400 HP (18,700×2)	Steam Turbine 36,000 HP	Steam Turbine 33,000 HP	Steam Turbine 30,000 HP
Service Speed	14.5 knots	14.6 knots	15.65 knots	16.5 knots	16.0 knots
Cargo Holds (Total Capacity)	470,000 m^3	399,600 m^3	303,688 m^3	245,058 m^3	192,000 m^3
No. of Crew	Undecided	51	31	32	29
Date of Completion	Nov. 1971	Sep. 1968	Aug. 1970	Dec. 1966	Jan. 1966
Shipbuilder	Ishikawajima-Harima Heavy Industries Co., Ltd., Kure Works	Ishikawajima-Harima Heavy Industries Co. Ltd., Yokohama Works	Mitsubishi Heavy Industries, Ltd., Nagasaki Shipyard & Engine Works	Ishikawajima-Harima Heavy Industries Co., Ltd., Yokohama Works	Ishikawajima-Harima Heavy Industries Co., Ltd., Yokohama Works

Figure 1. THE SIZE OF NISSEKI MARU



To graphically explain the size of the *Nisseki Maru*:

(a) The total deck area is about 16,700 m^2, equivalent to two soccer fields or 63 tennis courts.

(b) Height from the bottom to the top of the wheelhouse is 53 meters, equal to a 16-story building. Height to the funnel top (there are two funnels each measuring 25 m in height and 5.8 m x 3.7 m in oval section) is 69 meters—comparable to a 20-story building. Height to the radar mast tip is 74 meters, equal to a 22-story building.

(c) The total length of hull welding lines is 920 kilometers, which is about three times the distance between London and Paris.

(d) The two bow anchors weigh 24.6 tons each and have chains extending a total of 770 meters.

(e) Paint required will weigh about 300 tons. Since it takes 0.25 kg to paint one square meter, 300 tons of paint can cover an area equivalent to 145 soccer fields.

(f) Cargo oil pipelines, ranging from 75 to 90 cm in diameter, extend a total of about 1,700 meters, which is a part of the total 17,000 meters of piping the ship needs for sea water, fresh water, steam, remote control wiring protection, etc.

(g) The tanker will carry a maximum 450,000 kiloliters of crude oil, enough to fill 180 swimming pools (50m long, 25m wide and 2m deep), or 25,100,000 oil cans of 18-liter capacity. If this many oil cans were piled up lengthwise, the height would be 990 times that of Mt. Everest.

The extraordinary size of the *Nisseki Maru* required use of new construction equipment, such as the "Operation Unit System," developed by Ishikawajima-Harima Heavy Industries Co., Ltd. for construction of parallel hull sections.

This system consists of a track-guided tank-type buggy equipped with stand-and-fall type operation arms, a vertically and horizontally sliding platform, and a tool room for a welding machine, oil jacks and jigs. The whole system moves about as desired to offer a safe platform for efficient work, thus making conventional scaffolding unnecessary.

In the case of the *Nisseki Maru*, three Operation Unit Systems are being used—one each on the upper, middle and lower portions of the parallel hull sections.

The *Nisseki Maru*, when completed, will transport crude oil from Ras Tannūrah in the Persian Gulf to one of Japan's main crude oil storage bases—Central Terminal Stations (CTS)—located at Kiire, Kagoshima. On her Gulf-bound voyage, she will sail via the Strait of Malacca. On her return voyage, however, since her draft will be too deep for the Strait of Malacca, she will go through the Lombok Strait between Bali and Lombok, Indonesia.

The *Nisseki Maru* crew will include women members, the first on an ocean-going Japanese ship. Teams each including a licensed nurse and three cateresses will alternate on short rotation.

Japan Sets the Pace

To meet growing needs for mass, high-speed and specialized transportation, ships have gotten larger year by year. This increase in ship size has been made possible by continuous advancement in shipbuilding and related technologies.

The trend to bigger ships is not limited to tankers. Because of the advent of containerization, there will be giant cargo liners of 50,000 tons gross or over built in 1971. Trampers, led by ore carriers, are also getting bigger.

Nevertheless, growth in ship sizes has been most marked in tankers. Because they carry a liquid cargo they can load and unload at offshore facilities; as a consequence they are less restricted as to draft, and hence to ship size. Other important factors in the increasing size of tankers include the need for mass transportation to meet growing oil consumption around the world, and the popularity of long-term chartering, a practice aimed at securing stable transportation of crude oil for consignees.

Looking back over the history of tanker size, the years around 1950 saw 20,000 tons deadweight as the standard size; by 1955 tankers of 45,000 tons deadweight were not unusual. Thereafter, as shown in Figure 2-(1) and -(2), the *Universe Apollo* of National Bulk Carriers, Inc. (NBC) broke the 100,000-ton-deadweight barrier in 1959; the *Nissho Maru* of Idemitsu Tanker Co., Ltd. followed with 132,334 tons deadweight in 1962. In 1966, the 153,685-ton-deadweight *Tokyo Maru* of Tokyo Tanker Co., Ltd. was launched, as was the 206,005-ton-deadweight *Idemitsu Maru* owned by Idemitsu Tanker Co., Ltd. In 1968 the *Universe Kuwait* of Bentry Transportation Co., Ltd. made her debut with a massive 327,000 tons deadweight to set another new record.

Thus, tankers tripled in size in a matter of 10 years and, significantly, the leader at every stage of progress has been a Japanese-built ship. This tradition is to be continued by the 372,400-ton-deadweight tanker *Nisseki Maru*, which is now under construction and will be classed with the Society.

(Figure 3 shows the trend in maximum outputs of main marine engines manufactured in Japan; these engines were not necessarily the main engines of the record setting ships.)

NK surveyors inspecting a giant hull block of the *Nisseki Maru*

Figure 2-(1). WORLD'S LARGEST SHIP SIZES

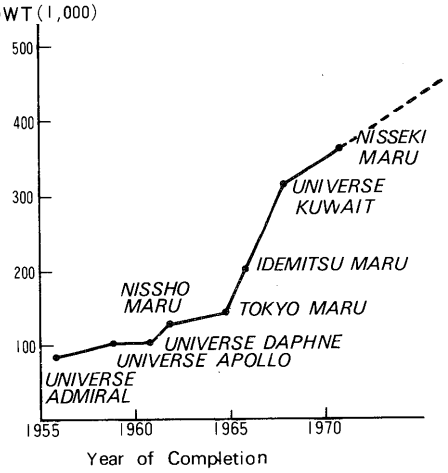


Figure 2-(2). WORLD'S LARGEST SHIP SIZES (LOGARITHMIC GRAPH)

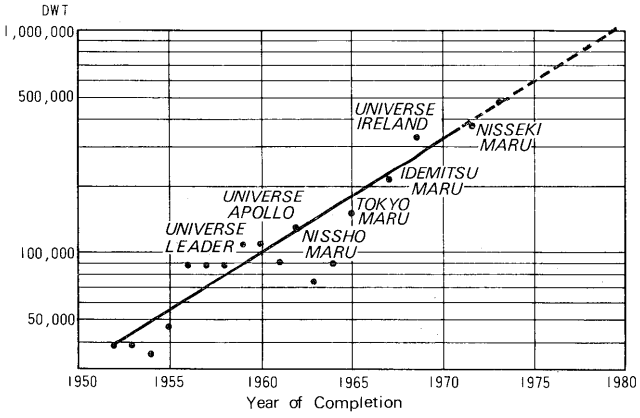


Figure 3. MAXIMUM OUTPUTS OF MAIN MARINE ENGINES MANUFACTURED IN JAPAN