

IV. THE SHIPBUILDING INDUSTRYA. Production: Physical and Technical Aspects

1. Importance of the Industry. Shipbuilding was one of the five "key" or "nucleus" industries set apart in 1943 by Premier Tojo for exceptional treatment, especially as regards expansions. Throughout the war it had a priority second only to aircraft. This position followed from the insular nature of Japan, her shortage of industrial raw materials, and her need to exploit her far flung conquests in order to retain them and pursue the war. The maintenance of armies and air bases abroad also required huge quantities of supplies and hence many bottoms.

2. Structure of the Industry. About 90 percent of the private building in Japan is done in ten yards. Of these, there are five leading private shipyards which account for about 55 percent of the total private building. Four naval yards in Japan proper (and two shipyard clusters in Shanghai and Hong Kong, in addition), are to be considered among the larger units in the industry. (See Appendix IVa.)

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1. Since the bulk of this study was written well before the end of the war in the Pacific, reference is made to the entire Japanese Empire instead of the four main islands alone.



### 3. Steel Shipbuilding.

a. General. Statistics on the Japanese merchant fleet as it existed in 1939 show that of the vessels of 100 gross tons or over, totaling 5,629,845 gross tons in that year, over 89 percent of the ships ( and 99 percent of the tonnage) were steel vessels. It was estimated for 1944 that Japan's shipyards as a whole produced some 700,000 gross tons of steel merchant vessels and 400,000 displacement<sup>1</sup> tons of naval ships. (See Map. III for map of the industry.)

b. Geographic Distribution. Two-thirds of Japan's principal steel shipyards are in Southwest Japan. Of the eleven principal yards in this region, seven are strung along the north coast of the Inland Sea from Hiroshima to Osaka. Three are in Kyushu (Nagasaki Prefecture) and one is on the North coast of Honshu (Kyoto Prefecture). Included among the principal yards are the three government navy yards, one at Sasebo (Nagasaki-ken), one at Kure (Hiroshima-ken) near the west end of the Inland Sea, and the third at Maizuru (Kyoto-fu) on the Japan Sea. Kure is equipped to build and drydock the largest type vessels of the Japanese fleet.

<sup>1</sup> See Appendix IVb for explanatory note on tonnage designations and size definitions.



Sasebo is the principal repair base of the fleet, and Maizuru is important for construction of destroyers, PT boats, heavy and light cruisers. The second-class shipyards are concentrated at Osaka-fu and in Shimonoseki-Kaikyo area, with scattered establishments elsewhere along the Inland Sea.

The yards in North Central Honshu probably accounted for about 220,000 gross tons or nearly one-third of the steel merchant vessels constructed in Japan in 1944, and 80,000 displacement tons or one-fifth of the Naval vessels. Approximately one-third of the number of Japan's principal shipyards are located in this area. Kanagawa Prefecture accounts for over nine-tenths of the shipbuilding in North Central Honshu. The Naval Base at Yokosuka is one of the two largest naval yards in Japan. It is equipped to build or repair battle ships, carriers, and cruisers, as well as smaller vessels. Three important companies in Kanagawa Prefecture, two at Yokohama and one at Uraga and Yokohama, have approximately equal facilities for ship construction and repair, each producing roughly 7 percent of Japan's total merchant tonnage. Naval construction and repair is also carried on by these yards. There are five smaller shipyards in North Central Honshu, of which three are in the Tokyo Area. One of these at Kobe, ranks among the largest producers of marine engines in Japan. There is also a small shipyard at the Naval Guard



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Base at Ominato in Aomori Prefecture. It is not known if this yard has been raised to the status of a regular naval base. Finally there is a shipyard in Niigata (Niigata-ken) which may become of increasing importance as Japan relies more heavily on shipping in the Sea of Japan.

The only two shipyards known to be in operation in Hokkaido, one at Hakodate and the other at Muroran, were estimated to produce 10,500 gross tons of merchant vessels in 1944 or less than 2 percent of Japan's probable total steel merchant vessel output of 700,000 gross tons. While it is unlikely that either of these yards build any ships larger than a medium merchant or small naval vessel, they are probably important facilities for servicing those portions of the Japanese Navy which patrol northern waters.

#### 4. Wooden Shipbuilding.

a. General. In 1943 Japan began increasing wooden ship construction. Several of the largest shipping and shipbuilding companies became interested in the program. It is estimated that Japan proper produced 400,000 - 500,000 gross tons of wooden ships in 1944 and that the areas under her control produced about 250,000 gross tons. In view of the inefficiency of wooden tonnage<sup>as</sup> compared with steel tonnage, this added the equivalent of about 325,000 tons of steel bottoms. (See Appendix IVc for details of wooden shipbuilding activities in Japan and Occupied areas.)

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Table 7 gives a summary of supplementary data based on reported wooden shipbuilding activities in areas outside of Japan during 1944.

Table 7.

Country	Specific Location	Est. No. of Ways	Est. Tonnage of Vessel	Est. Period of Prod. (mo.)	Estimates of 1944 Prod. (tons)
Koraa	Yalu River Section	8	150	3	4800
Kwantung	Leased Terri. Dairēn	10	150	2	9000
Manchuria	Antung	5	800	5	8666
	Yinkow (Newchang)	4	150	3	2400
China	Tangku	2	200	3	1600
	Taku	2	200	3	1600
	Tientsin	2	200	3	1600
	Tsingtao	12	200	3	9600
	Shanghai	41	150	2	37800
	Canton	6	150	3	3600
	Hong Kong	61	150	2	54900
Indochina	Hanoi-Haiphong area	15	150	4	6750
	Vinh	12	800	5	20800
	Saigon area	61	various	various	29450
Thailand	Bangkok	8	150	6	2400
	Bandon	8	150	6	2400
Malaya	Singapore	10	150	3	6000
	Penang	6	150	3	3600
Burma	Rangoon	12	150	6	3600
	Moulmein	2	150	6	600
NEI	Batavia	10	150	4	4500

1. These figures have not been adjusted to equivalent steel tonnage.



	Kuching	10	150	4	4500
	Surabaya	8	150	4	3600
	Makassar	5	100	5	1085
	Balikpapan	6	150	5	1950
	Belawan	3	150	5	975
	Amboina	2	150	5	650
Philippines	Manila area	14	150	5	4550
	Aparri	3	150	5	975
	Legaspi	3	150	5	975
	Calaban	6	150	5	1950
	Davao	4	150	5	1300
Formosa	Keelung	10	100	3	4000
	Takao	18	100	3	7200
TOTAL					249,376

b. Geographic Distribution. Yards scattered widely

along the coast of Southwest Japan are contributing about two-thirds of the wooden ships in Japan proper, while those along the coasts of North Central Honshu will contribute slightly under one-third of this total. The remaining few percent are probably contributed by three wooden shipyards known to be in operation in Hokkaido. (See Appendix IVc.)

Although the wooden shipbuilding yards are dispersed in Japan, those in the occupied areas, as may be observed from Table 7, are fairly well concentrated in the mainland ports.

5. Summary of Shipbuilding, Repairs and Losses.

Tables 8 and 9 show authoritative American estimates of merchant shipbuilding for the period 1941 - 1944 and naval shipbuilding for 1942 - 1944, respectively.



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Table 8

## Estimated Japanese Wood and Steel Merchant Shipbuilding Production, 1941-1944

1941	325,000 gross tons
1942	350,000 gross tons
1943	600,000 gross tons
1944	<u>900,000</u> gross tons
Total	2,175,000

Table 9

Naval Construction (1942-1944)  
(Standard Displacement Tons)

	1942	1943	1944
<b>PRINCIPAL COMBAT TYPES</b>	(40) 221,286 (67)	261,713 (74)	284,000
BB (battleships)	(1) 45,000 (1)	45,000 (1)	45,000
CV (carriers)	(3) 68,000 (2)	52,000 (3)	68,000
CVE (escort carriers)	(2) 36,000 (4)	54,000 (4)	54,000
CA (heavy cruisers)	(1) 12,000 (1)	12,000 (1)	14,000
CL (light cruisers)	(2) 11,000 (2)	11,000 (2)	11,000
DD (destroyers)	(15) 31,900 (15)	31,900 (15)	32,000
SS (submarines)	(17) 29,386 (42)	55,813 (48)	60,000
<b>MINOR COMBAT TYPES</b>	(140) 28,400 (215)	39,895 (340)	59,370
TB (torpedo boats)	(6) 1,290 (2)	400 (16)	4,800
PF (patrol frigates)	(5) 6,000 (11)	13,200 (20)	24,000
PG (gunboats)	(1) 1,000	1,000	
PR (river gunboats)	(1) 320 (1)	320 (1)	320
FC (subchasers)	(23) 5,230 (52)	12,405 (75)	15,000
MTB (motor torpedo boats)	(80) 960 (122)	1,470 (200)	2,400
CM (minelayers)	(2) 3,800		
DM (small minelayers under 1000 T's)	(8) 5,120 (7)	4,000 (4)	2,850
AM (minesweepers)	(16) 6,000 (19)	7,100 (24)	10,000
<b>AUXILIARIES</b>	(3) 6,000 (3)	42,000 (4)	56,000
AO (tankers)	(3) 42,000 (3)	42,000 (4)	56,000
AGS (survey ships)	(1) 2,000		
ARC (cable layers)	(2) 4,000		
<b>TOTAL</b>	(183) 255,686 (285)	343,608 (418)	399,370

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By the middle of 1944, Japan's losses of merchant and Naval vessels had so reduced the number of oceangoing ships that she was unable to find the transport required both to supply military forces committed in various areas and to move the volume of raw materials necessary to maintain 1943 levels of industrial output. In order to make ship construction equal losses, Japan would have had to build merchant vessels at the rate of at least 2,500,000 gross tons in 1944.

Latest figures as revealed by the Japanese Diet (5 September 1945) indicate that the nation had no more than 200,000 odd gross tons of operable merchant tonnage (over 100 tons) left at the cessation of hostilities.<sup>1</sup> Diet figures for wartime naval building and losses are given in Table X.

Table 10

Total Building and Losses of the Japanese Navy During the War					
	No. at beginning of war	Built since 1941	Lost	At End of War	Usable
Battleships	10	2	8	4	0
Aircraft carriers	10	15	19	6	2
Cruisers	41	6	36	11	3
Other warships (including seaplane tenders, submarine tenders, auxiliary vessels)	14	3	11	6	3

1. This figure may be a little on the low side to gain Allied sympathy and aid for their economic reconstruction. For example, their total does not include tonnage of ships in repair which exceeds operable tonnage.

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Table 10 continued

Destroyers	111	63	135	39	30
Submarines	64	126	131	59	50
Coast Defense Vessels	4	168	72	100	80
Total	254	383	412	225	168
Other smaller craft	136	444	272	308	(date incomplete)
Grand Total	390	827	684	533	(date incomplete)

Source: Tokyo, DOMEI, in Romaji to G.E.A., 5 Sept 1945, 4:00 a.m. EWT

#### 6. Marine Engines and Equipment

a. Engines. The most important component placed in the hull during the construction is the propulsion machinery. Engine construction in Japan has not been wholly satisfactory in amount for levels of ship output in the past. Larger engine builders are in all cases also shipbuilders and the construction of engines is highly concentrated in a few plants.

In the three-year period, 1936 to 1938, about 86 percent of all merchant vessel engines (measured in horsepower) and 100 percent of naval vessel engines were built in engine plants of the shipbuilding yards themselves. In addition, there are various marine engineering firms which may be included among the leading producers of marine turbines. During the period immediately preceding the war over 50 percent of all merchant vessels engines and 80 percent of the engines of ships of 5000 tons or more were produced by the four leading shipbuilders. (See Appendix IVd for merchant marine engine producers). Naval engine construction is also concentrated,

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6 yards accounting for over three-quarters of the horsepower output. One of these, Kawasaki, is also an important producer of merchant vessel engines; the remainder, however, are either naval yards or relatively small producers for the merchant marine. (See Table 11 for naval engine producers, 1936-1939.)

Table 11

Naval Engines Built By Japanese Engine Builders, 1936-1939

Kawasaki	361,900	18.6
Fujinagata	241,600	12.5
Mitsubishi, Nagasaki	180,000	9.3
Uraga	257,200	13.3
Navy Yard, Maizuru	206,850	10.7
Navy Yard, Sasebo	227,000	11.7
Navy Yard, Yokosuka	142,000	7.3
Navy Yard, Kure, Hiroshima	196,000	10.1
Mitsubishi, Yokohama	37,400	1.9
Ishikawajima	26,900	1.4
All Others	61,250	3.2
Grand Total, all engine work	1,938,100	100.0
1. Tama, Tsurumi		

Inasmuch as Japan's last reported figure for marine engine construction -- i.e., the figure including only large engines for 1937 -- was around 1,000,000 horsepower (this may be an understatement of as much as 50 percent), it is not difficult to imagine that considerable tightness may exist in the Japanese marine engine position. Not only would a large expansion of marine engine production probably meet serious manpower problems, but also difficulties would certainly be encountered in manufacturing in Japan the equipment required to increase the capacity for producing large forgings.



The suggested shortage of propulsion machinery, a factor seldom discussed by Japanese writers, may offer a partial explanation of the country's poor shipbuilding performance. The horsepower requirements for equipment of naval vessels are enormous. To supply Japan's Naval construction since Pearl Harbor, it is estimated that some five million horsepower has been required. The horsepower requirements for merchant vessel construction during the same period, while a mere fraction of those for Naval ships, are difficult to estimate accurately, since there is no stable relationship between gross tonnage and horsepower. Requirements vary a great deal depending on the lines of the vessel and the speed at which she is designed to perform. A figure of some 800,000 horsepower might be taken as approximately representative of the merchant vessel requirements for 1942 and 1943, and (as shown in Appendix IVe) 1938 production was well under 400,000 horsepower.

Merchant vessels are, for the most part, powered either by Diesel engines or by steam reciprocating engines. It is true that a few of the largest passenger and passenger-cargo vessels are driven by steam turbines and that some of the very small boats employ gasoline engines. These types are relatively unimportant, however, and can be ignored. In the year 1939, the merchant fleet of Japan Proper was powered in the following manner:



Table 12

Utilization: by type of Japanese Marine Engine, 1939

	VESSELS		PERCENT DISTRIBUTION	
	<u>Number</u>	<u>Gross Tonnage</u>	<u>Number</u>	<u>Gross Tonnage</u>
Steam recip. engines	1,443	3,413,671	62.4%	60.8%
Turbine engines	124	677,795	5.3%	12.0%
Motorships (Diesels)	697	1,518,041	32.3%	27.2%
Total	2,337	5,629,845	100.0	100.0

The larger combat vessels of the Japanese Navy -- battle-ships, cruisers, aircraft carriers and destroyers -- are driven by geared turbines or turbo-electric units. Submarines employ Diesel engines for power when on the surface, and electric storage batteries when submerged.

Marine engines are distinctive types of engines; their production is customarily specialized and requires both experience and suitable machine tools.

The emergency wooden boats which were to be constructed throughout the coprosperity Sphere were reported to be sailing vessels equipped with auxiliary engines. Since the engines which would be required for these small boats are smaller and less exacting than those customarily used in the greater part of Japan's shipping tonnage, it is not easy to determine whether they were



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manufactured by the firms producing the usual types of marine engines or whether they were contracted to other machinery firms.

The merit of wooden ships in this connection is that they require only small engines. Japan has considerable capacity for the manufacture of small engines as a result of motorizing her fishing fleet in the latter 20's and early 30's. The establishments engaged in producing engines for the fishing fleet customarily are able to manufacture engines up to four to five hundred horsepower but not beyond; therefore, these factories have not been able to ease the tightness in the large marine engine position. By building small wooden vessels, Japan was able to utilize these facilities and get badly needed increases in marine propulsion machinery.

b. Other Equipment. A wide variety of raw materials and semi-manufactured or finished parts goes into the construction of a ship. A complete list of such components and parts would include steel plates, structural steel plates, copper wire and cable and other non-ferrous metal parts, rope, gauges and measuring instruments, glass and optical goods, etc. Needless to say, most of these parts and materials are furnished to shipyards by other manufacturers, in most cases by small firms. From the point of view of disarmament, it is worth giving special consideration to the builders of engines for merchant and particularly naval ships.

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## 7. Technological Review of Shipbuilding

a. Plant and Equipment. A typical shipyard in Japan is a fairly well integrated establishment. There are usually several building ways equipped with overhead clearance. It is customary for marine engines to be built at a plant located in the shipbuilding compound. Various other buildings house machine shops, power plants, assembly works, etc. Ordinarily the building yards also include one or more drydocks for the repair of vessels. It is not the general practice, however, for steel plates to be rolled by the shipbuilders, though that occurs in a few cases.

b. Time Required to Restore Production. Assuming a 100 percent destruction or dismantling of the various installations in and around a shipyard, the following estimates of the time required for their replacement have been made:

Table 13

### Estimated Time Required to Replace Shipyard Installations

<u>Facility</u>	<u>Replacement Time</u>
Building Way	2 - 3 months
Drydock (400 ft.)	6 - 7 months
Marine Engine Works	6 - 8 months

The most difficult part of a shipyard to replace is the engine building shop. An engine works, especially one equipped to produce propulsion machinery for naval vessels, requires a great many precision machine tools. The shortage of machinery in Japan is fairly acute, and



it is to be doubted whether certain key tools could be replaced in less than a year. Dismantling of the larger marine engine works would be one of the most effective measures of disarmament and control in the shipbuilding industry.

• c. Shipbuilding Conversion Possibilities.

In considering the convertibility of the shipbuilding industry, it is best to do so section by section, since some stages in the process are more convertible than others. A positive statement regarding convertibility of a facility should not be regarded as an argument for conversion, without consideration of long-run security and peace.

The component plants, such as machine shops, are adaptable to miscellaneous part and component production.

Electrical equipment manufacturing facilities in general and propulsion equipment facilities in particular, may be used in the post-war period. Motors and generators are custom-built and therefore have adaptable facilities.

Pipe-fitting plants, on the other hand, are fairly specialized and not too adaptable. The same is true of heavy steel plant capacity for war ships, while lighter supplementary sheet and strip metals can be used in other types of production, as in merchant shipbuilding.

In this country even the docks and ways of merchant shipbuilding plants are being considered, in certain instances, for adaptation to



production of prefabricated housing and other construction purposes.

d. Labor. It is estimated for 1944 that Japan employed close to one-half million workers in the total shipbuilding program. There is no manpower shortage from the point of view of quantity, but there is a shortage of skills.

8. Japanese Commercial Ship Repair Facilities.

a. Drydock Facilities. Ship repairs fall into two main classes; those requiring drydocking, and those which do not. It is believed that above-water repairs have not occasioned serious difficulties, except possibly with respect to labor, but that the same limitations of machinery and equipment (chiefly shafting and propellers) which applied to building obtained in under-water repairs.

(i) Japan Proper. Commercial ship repair facilities in Japan proper are highly concentrated in the first three of the four areas listed below:

(a) The island of Kyushu and the western tip of Honshu --25 percent.

(b) The Inland Sea Section, including Hiroshima in the west, both sides of the sea, and as far northeast as Osaka --52 percent.

(c) Tokyo--Yokohama area - 20 percent.

(d) The northern part of Honshu and the island of Hokkaido --3 percent.



Drydocking facilities<sup>1</sup> for under-water repairs aggregated, at the maximum, 597,000 gross tons for Japan Proper and 388,000 gross tons for Manchuria, Formosa and the occupied territories -- total capacity 985,000 gross tons.

However, the above tonnage capacity of these drydocks were not utilized at any one time and it is reliably estimated that no more than 600,000 gross tons of Naval and merchant tonnage were drydocked simultaneously. There is no necessary relation between the total drydocking capacity and the size of vessels drydocked because of necessary indiscriminate drydocking resulting from emergency repairs, bottom scraping, and ordinary maintenance repairs.

Furthermore a part of this drydock tonnage capacity is in areas not easily accessible to damaged ships (See Table-14.)

Table - 14

## Distribution of Japanese Drydock Capacity in Principal Port Areas

<u>DISTRICT</u>	<u>Capacity in Gross Tons</u>	<u>Percent of Total for Japan Proper</u>
Osaka	73,000	12
Yokohama	54,000	9
Innoshima, Hiroshima	44,400	8
Nagasaki	51,600	9
Kobe	72,400	12
	<u>296,100</u>	<u>50</u>

<sup>1</sup> Estimated, end of 1943



(ii) Overseas Areas. It is estimated that all regions outside of Japan proper contain drydocks totalling the following capacities and distribution:

Table - 15

## Drydocking Facilities in Japanese Controlled Areas

<u>Country</u>	<u>Estimated Capacity (in gross tons)</u>
China	138,700
Formosa	26,000
East Indies	33,500
Philippines	10,000
Malaya	57,500
Thailand	4,500
French Indochina	7,500
Kwantung Pen.	<u>41,000</u>
Total	388,000

In China the most important facilities are <sup>in</sup> Hong Kong and Shanghai. In the East Indies, Soerabaya and Batavia are most important. The only dock listed in the Philippines is apparently the American floating dock "Dewey" located at Olongapo. This dock has a capacity of 10,000 tons. Singapore, with a capacity of 57,500 tons, is the only important drydock center in Malaya.

In the Kwantung area, Dairen appears to have facilities for handling up to 35,000 gross tons. It might be well to note in this connection that since Port Arthur, located nearby, is considered to have been a navy facility exclusively, it is very probable that a good



part of the facilities at Dairen were also used for naval purposes.

b. Facilities Other Than Drydocks (Patent Slips, Marine Railways, etc.). No information is available concerning facilities other than drydocks in Japan Proper; the assumption is that the capacities involved were not sufficiently large to warrant much attention. However, in the occupied countries, where handling of vessels of smaller tonnage in patent slips, marine railways, etc., is the usual procedure, a total capacity amounting to 25,000/gross tons fell to the Japanese. By far the majority of these facilities handle vessels from 50 to 750 gross tons. These are broken down by localities below:

Table - 16

Repair Facilities, Other than Drydocks, in Japanese Controlled Areas

<u>Country</u>	<u>Estimated Capacity (in gross tons)</u>
China	11,000
Formosa	500
Burma	1,000
East Indies	2,000
Philippines	7,150
Malaya	2,850
French Indochina	500
Total	25,000

#### 9. Principal Raw Materials.

The principal raw materials of ship construction are iron and steel, non-ferrous metals, timber, textiles, paint, cement, asbestos, pottery products, etc.; in fact, a close scrutiny of raw materials/required



will demonstrate that they are connected with nearly every industry. Studying these in connection with the price of a ship, we find that for an 8,500-ton cargo vessel, the price of materials is about 80 percent. Of these material costs, just under 46 percent are taken up by soft steel. In building cargo ships, for every ton of gross tonnage, 0.6 tons of iron is required, so that for a ship of 10,000 tons (gross), 6,000 tons of iron are needed.

a. Iron and Steel. What has been said about iron and steel above (Chapter III) in connection with motor vehicles and tanks also applies here. The cut-back in Japan's capacity to build and equip warships and merchant ships which would follow from the foregoing analysis would alone reduce Japan's steel requirements by as much as a quarter of a million tons of ingot steel a year.

b. Wood. Among other limiting factors in Japan's wooden shipbuilding program was the availability of suitable wood. In the First World War, the problem was met by imports of American lumber. The required timber is now available in Japan, Manchuria, and the Southern Regions, but difficulty was encountered in maintaining properly seasoned supplies and finding bottoms to transport this timber to Japan. Teak, which is especially useful for planking below the waterline, was shipped north from Burma, Thailand, and Java. It is necessary for China to import practically all of the timber for its yards.



B. Organization of the Shipbuilding Industry

1. Brief History and Economic Considerations.

a. Review to 1932. <sup>considering</sup> In addition to/the specific questions of security and convertibility in the Japanese shipbuilding industry, it is necessary that we review historically and briefly the economic aspects of the shipbuilding industry in Japan with a view to determining to what extent the industry has been expanded along uneconomic lines.

Ever since the Restoration of 1868, the Japanese Government has paid close attention to shipping problems, and soon after the war of 1895 in China, it embarked on a program of subsidies governed by laws enacted in 1896. The abnormal boom conditions prevailing during World War I, when (in 1919) 612,000 gross tons of merchant ships were launched, diminished the need for subsidies, but soon afterwards the annual amount of operating subsidies tended to revert to dimensions of 1914.

During the 1920's the shipbuilding industry entered a long period of depression. Merchant ship construction dropped to a low of 42,000 gross tons in 1927, and operating subsidies amounted to about ten million yen a year. During this period, the Government did not give direct shipbuilding subsidies, but assisted shipbuilders by means of bounties on domestic steel production and certain exemptions from import duties. In 1929 the Government framed a program for the as-  
on  
sistance of shipping in the form of loans/easy terms for



shipbuilding. A loan fund of thirty million yen was made available, but owing to the world economic depression which followed, little use was made of this facility. A slow <sup>rate of increase</sup> increase then began; the /was greatly accelerated in the early 30's by a government subsidized program of merchant ship construction. Under government direction Japanese lines acquired fast cargo ships which were the equal of any in their class in the world.

b. Scrap and Build Schemes; Shipbuilding During the 1930's. In 1932, the Japanese Government made an important decision when, with a view to improving the unfavorable age distribution of the Japanese Merchant Marine and to reducing the frequency of marine casualties, it introduced the first of three "Scrap and Build" Schemes. The first scheme, which took effect as of 1 October 1932, provided for the construction of 200,000 gross tons of new shipping, on condition that two tons of vessels of twenty-five years and over were scrapped for each ton of new vessels built under subsidy. Each new vessel had to be 4,000 gross tons or over, capable of at least thirteen and one-half knots speed, and built in a Japanese yard.

The scheme resulted in the scrapping of ninety-four vessels of about 400,000 gross tons and in the building of thirty-one new vessels of about 200,000 gross tons.

It was



estimated that the expenditure involved in building the thirty-one ships was a little less than 55,000,000 yen. The total government subsidy was nearly 11,000,000 yen.

The second and third schemes, which took effect in 1935 and 1936 respectively, were on a smaller scale than the first. Their combined result was the scrapping of 100,000 gross tons and the construction of seventeen vessels of about 100,000 gross tons, the rate of subsidy being little more than half that under the first scheme. The vessels built had a gross tonnage of 4,000 tons or more and were capable of over fifteen knots speed.

By the early part of 1937, the three Scrap and Build Schemes had resulted in the scrapping of some 500,000 gross tons of old tonnage and the construction of forty-eight new fast ships of some 300,000 tons gross. These forty-eight included more than four-fifths of the total number of Japanese vessels of over 4,000 gross tons and less than five years old. At that time Japan had more tonnage less than five years old in proportion to her total tonnage than any other country. The following table shows the ships constructed and scrapped in accordance with the three ship improvement plans.

Table 17

Ships Constructed and Scrapped in Accordance  
with the Three Ship Improvement Plans

Plan	Ships Constructed		Ships Dismantled		Fiscal Years
	Number	Total Tonnage	Number	Total Tonnage	
First	31	198,989	94	399,122	1931-34
Second	8	49,760	12	52,798	1935-36
Third	9	50,690	13	47,235	1936-37
Total	48	299,439	119	499,155	

Note: It was not possible to ascertain the number of vessels actually dismantled under the third plan.



The cost of the three ship improvement plans totalled ¥ 14,000,000 (\$4,062,800), including ¥ 11,000,000 for the first plan and ¥ 1,500,000 for each of the next two plans.

A fourth scheme came into operation in April 1937 and provided for the subsidized construction of superior passenger and passenger-cargo liners of not less than 6,000 gross tons and nineteen knots speed, at rates of subsidy approximating in some cases half the building cost. In a supplement to the Official Gazette of July 1937, it was stated that the subsidies, though payable by installments spread over eighteen years, would be paid during the next four years for the construction of 150,000 gross tons of passenger vessels and 150,000 gross tons of passenger-cargo vessels. It was proposed to spend a total of over fifty million yen on this scheme during the eighteen years beginning with 1937-38.

Over-all, between 1934 and 1939 the capacity of the ship-building yards was greatly increased to meet the growing demands of the merchant marine. Encouraged by government subsidies, the period of great prosperity for the industry reached its peak in July 1937, coinciding with the outbreak of the war with China. This prosperity was the result of a planned war economy and need for additional shipping to engage in war. The 451,000 tons of shipping launched in 1937 was the greatest amount completed since 1920.



of  
 Table 18.3 gives the total launchings of vessels 100 gross tons and upwards for selected years between 1913 and 1938:

Table 18.3.

Total Launchings of Merchant Vessels (in tons)

<u>Date</u>	<u>Number</u>	<u>Tonnage</u>
1913	152	64,664
1920	140	456,642
1930	37	151,272
1932	44	54,422
1934	155	152,420
1936	180	294,861
1937	180	451,121
1938	146	441,720

Source: Shipbuilding in Japan, 1940 (Japan Economic Federation).

The trend in the middle thirties was towards the construction of luxury passenger liners for deep-sea service, but was reversed after the outbreak of the war with China. The shipbuilding industry directly reflected the change in shipping needs from large-sized vessels for deep-sea service to, small and medium-sized bottoms for coastal trade. Of the total orders placed up to the end of May 1939, 165 cargo vessels accounted for 808,670 tons. Of those, thirty-four vessels larger than the 7,000-ton. class amounted to 306,600 tons, while 133 under 6,000 tons totalled 502,070 tons. Compared with the figures for 30 November 1938 or six months earlier, the former class showed a decline of two in number and 27,930 in tonnage, but the latter class gained eighty-five in number and 325,420 in tonnage.

Table 19 shows the ships launched by 1,000 ton classes between 1932 and 1938. Little change in emphasis is visible here



Table 19

Class in tons	No. of Ships	1932		1934		1936		1937		No. of Ships 1938
		tons	%	tons	%	tons	%	tons	%	
1,000	1	1,500)		1,800)	18	25,820)	24	36,355)	15	
2,000	4	9,900)	60	5,300)	20	19,050)	31	35,000)	24	11
3,000	1	3,500)		3,000)	9	31,510)	8	28,030)	7	
4,000	-	----		9,000)	9	38,930)	14	62,700)	10	
5,000	-	----	20	----	25	21,500)	36	32,380)	36	3
6,000	2	12,000)		20,100)	6	39,200)	9	58,580)	16	
7,000	-	----		66,250)	3	22,150)	13	93,420)	5	
8,000	2	16,800)		----	55	17,550)	20	8,900)	27	1
9,000	-	----		19,730)	2	18,220)	1	9,000)	1	
10,000	-	----		----	3	36,800)	13	55,100)	13	9
Total	10	43,760		124,180	63	270,710	93	419,665	77	

Source Far East Yearbook, 1941.

c. Naval Construction; Comparison with Merchant Vessel Constructio

Naval vessel construction was of course also stressed during this period, as is shown by the following table (Table 20). Merchant ship launchings are also shown in this table and it will be noted that minor variations exist between these figures and those previously given in table 19. These differences are not significant, but largely reflect different source material. The information below is carried over into 1940.

Table 20

Total Tonnage of Steel Merchant Ships and Naval Vessels  
Launched by Yards in Japan and Japanese-Controlled Territory,

	1934-1940	
	Naval Ships (displ. tons)	Merchant Ships (gross tons)
1940	157,510	208,014
1939	118,790	342,880
1938	53,812	438,890
1937	52,258	487,357
1936	53,305	305,803
1935	39,762	145,901 <sup>a/</sup>
1934	38,274	154,860 <sup>a/</sup>

Source: Glasgow Herald, Annual Trade Review, 1936, 1937, 1938.  
Lloyd's Register of Shipping, London, special tabulation  
supplied in March, 1943. Jane's Fighting Ships, 1941.  
Oriental Economist (Tokyo) April, 1936.

a/ Includes only the output in Japan proper.



RESTRICTEDd. Conclusions.

Although Japan is only one of the many nations which have heavily subsidized their merchant marine, her building subsidies have been the highest in the world and there are none whose intent has been so clearly the promotion of wartime production capacity. This was particularly true in Japan after 1932; subsidies were given only for building ships that made thirteen knots or over, while special subsidies were given for those which made eighteen knots or over. Moreover, the Navy had to approve all plans before any subsidies were given. All efforts were made to make Japanese yards independent of foreign contributions. By the early 1930's ships built in Japanese yards were equipped with Japanese-made motors and engines, and only occasional fittings and certain marine precision instruments were imported.

All of these leading shipbuilding yards were owned by "a few great industrial and financial groups." Thus Mitsubishi and Mitsui together were responsible for half the tonnage launched in 1935. The shipyards were a direct part of other heavy industrial activities and several of the companies who built ships not only engaged in the shipping trade but also produced the materials from which the ships were constructed. /Jukogyo (Mitsubishi Heavy Industries) produced merchant and war ships, steam and diesel engines and machinery for them, and also steam turbines and boilers, water turbines, steam and electric locomotives,

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aircraft, and munitions of all kinds. This firm operated six main factories and shipyards. Another large shipbuilder, Kawasaki Jukogyo (Kawasaki Heavy Industries), extended its activities over a wide range of products, including railway locomotives and rolling stock.

The principal firms engaged in shipbuilding and their construction employment (in 1937) are shown in Table 21

Table 21  
Merchant Shipbuilding, 1937

<u>Firms</u>	<u>Construction or projected</u>		<u>Number of Workers</u>
	<u>Jan. 1937 (above 1,000 GRT)</u>	<u>January 1936</u>	
Mitsubishi	27	9,272	
Nagasaki	97,000	9,272	
Kobe	47,900	5,527	
Yokohama	135,500	3,116	
Hi koshima (repairs only)		692	
Total Mitsubishi	280,400	18,607	
Mitsui, Tama (Tokyo)	141,200	3,522	
Kawasaki, Kobe	180,400	8,831	
Harima Dockyard	97,600	2,982	
Osaka Iron Works	93,100	4,798	
Uraga Dockyard	43,000	2,420	
Tsurumi Dockyard	13,600	1,564	
Others	33,900	8,034	
Total	883,200	50,758	

Source: Schumpeter, op. cit., p. 615.

2. Government Encouragement and Supervision; Laws.

a. Shipbuilding Industry Law.<sup>1/</sup> The China and European Wars necessitated a large increase in the military shipping of Japan. It was necessary to make up for war losses in shipping as well as for the decreases in neutral and world shipping. For the most part Japan had to rely upon her own power and ability for further shipbuilding.

<sup>1/</sup> Passed by the 74th session of the Diet in 1939.



To cope with this newly arisen situation, Japan enacted several important shipping acts including the Emergency Shipping Control Act, the Shipbuilding Industry Act, and the Shipbuilding Control Act. Of these laws, the most fundamental is the Shipbuilding Industry Act, whose nature and function it will be well to describe in detail. The law has been described by a semi-official Japanese source in this way:

(i) Purpose of the Law. "The purpose of the Law is to increase the supply of vessels at low costs and the maintenance of adequate shipbuilding capacity from the viewpoint of national defense. The Law as passed by the 74th session of the Diet in 1939 provides measures for Government protection and control of the shipbuilding industry."

(ii) Government Supervision. "By this Law, the shipbuilding industry is brought under strict Government supervision. The establishment of new enterprises, amalgamation, and cessation of work of shipbuilding companies are subject to permission from the Government."

(iii) Shipbuilders' Privileges. "Shipbuilders, however, are given the right of eminent domain and are allowed to issue debentures to an amount twice their paid-up capital. The Government may issue instructions as regards the building of hulls, engines, and equipment not yet made in this country, and may grant subsidies in such cases. It may also order shipbuilders to use domestic products in building hulls, engines,



and equipment. The Government may set standards for quality and may disqualify products which do not conform to this standard."

(iv) Government Subsidy and Indemity. "The Government may, if necessary for the promotion of the shipbuilding industry, grant subsidies to either shipbuilders or shipowners. The Government may, in the public interest, order shipbuilders to effect changes in prices for vessels, hulls, engines, and equipment, as well as in repair costs, etc. The Government may also, when deemed necessary in the public interest, demand the installation, enlargement, and improvement of equipment, the repair of vessels, hulls, engines, and equipment, and the establishment of facilities for research on specified subjects. The Government may indemnify shipbuilders for any losses incurred by shipbuilders in the execution of these orders.

(v) The Right to Organize Compulsory Cartels.

"The Law also contains provision for cooperative associations which may be organized by shipbuilders for collective purchasing administration of materials, establishment of facilities for common use, control of business activities of members, and research work for the common benefit. The Government may order members of these associations to comply with regulations. Finally, the Government may instruct such organizations and may instruct outsiders to join the organizations, to undertake certain activities for the healthful development of the industry."



b. Fundamental Shipbuilding Regulations. While thus strengthening the control over shipping and shipbuilding, on the one hand, Japan adopted six measures in 1939 describing the standard for cargo vessels in order to encourage construction of these vessels on the other. Out of this a new national shipping policy grew up, under which a number of plans were put into execution.

But as an aftermath of 7 December, 1941 a demand for more rapid increase in Japan's shipbuilding arose. To meet the situation, a set of fundamental systematic shipbuilding regulations were adopted and made public in May 1942. These regulations were drawn up on the assumption that shipbuilders were to build, according to government plan and with powerful government assistance, as many ships within a certain period of time as the demand warranted. For the realization of this program, the following technical qualifications were considered essential:

(i) For a determined standard-size ship, certain fixed specifications of the ship's hull, engine equipment, and other parts were to be furnished to the builder along with the necessary drawings. The idea was to help facilitate mass production of ships. It was, in short, to standardize the planning, so that complications would no longer arise as they had in the past when different shipbuilders presented individual ideas, plans, and drawings.

(ii) With regard to the order for a non-standard ship,



construction work would not be accepted generally, except in such a special case as the building of a passenger boat.

(iii) In order to obtain the highest degree of efficiency from every individual shipyard, each yard would be assigned the building of a certain class of ship under the standardization plan, and would make the construction of such a type its speciality. There were nineteen classes, all told, running as follows: six classes or grades for cargo vessels, three for oil tankers, one for ore-carrying ships, five for wooden vessels, and four for wooden barges. The classes were divided as follows:

Freighters:

Type A	Total tonnage	6,300 tons
Type B	Total tonnage	4,400 tons
Type C	Total tonnage	2,700 tons
Type D	Total tonnage	1,900 tons
Type E	Total tonnage	830 tons
Type F	Total tonnage	495 tons

Tankers: Total tonnage of 10,000 tons, 5,000 tons and 1,000 tons.

Mineral ore freighters: Total tonnage of 5,500 tons.

The above vessels are made of steel. Vessels of smaller types, due to the lack of steel, are made of wood. They are called standard wartime wooden ships. They may be divided into two kinds:

Wooden freighters: Total tonnage of 250 tons, 200 tons, 150 tons, 100 tons and 70 tons.

Light wooden ships: Loaded tonnage of 300 tons, 200 tons, 150 tons and 100 tons.

C. Other Rationalization Techniques

the point that come  
Aside from individual builders were to/under the



standardized shipbuilding scheme, the following points were also stressed:

(i) Standardized specification for steel used in shipbuilding, (ii) development to the utmost of the scope within which substitute materials are used, (iii) simplification of the ship's hull, engine, and equipment, (iv) expansion of the scope within which electric welding is applied, and (v) general saving of materials by improving shipbuilding technique.

### 3. Administration

a. The Navy Ministry (Kaigun-sho). On 5 February 1942, the Government promulgated the Imperial Ordinance relating to the special wartime case of jurisdiction with regard to the business of shipbuilding. This (a) limited the authority of the shipbuilding industry to regulate the supply and demand of important materials used for ships (i.e., set up a priority system); and (b) transferred to the jurisdiction of the Ministry of the Navy, for the duration of the war only, jurisdiction (hitherto in the hands of the Minister of Communications (Tsushin-sho)) over construction and repair of merchant vessels.

Besides insuring elasticity between materials for naval construction and materials for merchant ship construction, this change made a single system out of the two construction plans, and in general contrived to regulate both. This put the construction of naval and merchant vessels fundamentally on



the same footing. For it was desirable that the question of the relative percentage of naval and merchant craft to be constructed should be governed by a unified plan, in accordance with the availability of materials, building facilities, and current requirement.

Only general schedules, however, were to be set by the Navy Ministry, while the allocation of orders and raw materials for specific yards were to be handled by the Industrial Equipment Management Corporation on the one hand, and by the Shipbuilding Control Association (Zosen Toseikai), on the other.

b. Industrial Equipment Management Corporation. Under the system of standard production and unified design which we have already described, ordering of ships by a single authority was inescapable, and the machinery that was set up to play the part of the single ordering authority was the Industrial Equipment Management Corporation. This National Policy Company took over the wartime standard-pattern ship program, on the basis of the government ship construction plans, and gave contracts to all the shipyards.

Aside from these activities, the corporation became the main instrument for financing Japanese shipbuilders and guaranteeing them against loss. In effect, it was at the same time a device for subsidizing the industry and for providing it with compensation in the case of loss, all at public expense.



According to the character of this corporation, the necessary number of ships are to be assured as long as the country needs them. This the Government accomplishes, on the one hand, by making part of the cost of building new ships a direct national burden, and, on the other hand, by supplying floating capital for shipbuilding. By revising the ordinance concerning compensation of losses, the Government raised the limit of the floating capital it would supply from two-thirds to four-fifths of the capital value of any one shipyard. By lowering the sphere of application of these provisions it extended them to all ships classified as small wartime standard-pattern ships. It has also equalized compensation for loss of capital through its monetary organ, the Industrial Bank of Japan. (In connection with shipbuilding finances it is interesting to note that the Bank of Japan allegedly supplied ¥192,000,000 in 1942, in addition to the capital coming from other government agencies).

In the event that there ceases to be a national need for the finished ships and the corporation shall have occasion to sell them for private use, it has been decided that the Government shall pay compensation for losses incurred by the corporation and that the standard prices for constructing ships and for transferring them shall be decided by the Government. The foregoing practices, besides establishing a financial policy, made the IEMC responsible for the positive expansion of shipbuilding through the application of two pivotal



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principles, namely, simplification of pattern and unitary construction -- one yard, one type, (See Appendix IV for additional details).

c. Shipbuilding Control Society. The Shipbuilding Control Society is the central body directing the control associations in this industry (To the / is appended a consultative association which includes the related industrial control associations) The Shipbuilding Control Society assists in handling the supply of materials under a priority system. Affiliated with the central Shipbuilding Control Society are five regional shipbuilding consultative associations made up of the medium and small scale manufacturers. The president of the society, which was established in 1942, is SHIBA Koshiro (formerly head of Mitsubishi Jukogyo), and the Managing Director is Vice Admiral (Reserve) KAWAHARA Shigeharu.

According to a semi official Japanese source, the Shipbuilding Control Society has been described as one of the planning agencies for general advancement of national power which has been established in Tokyo in accordance with the Major Industries Association Ordinance of September, 1941.

Member organizations of this society are design by the Navy Ministry (formerly/ Ministry of Communications) on the basis of the following requirements:

- (i) Any shipbuilding association which builds ships/ or constructs engines for ships, or both, over 100 meters long may be admitted as a member organization.
- (ii) Any shipbuilding proprietor who cannot meet the foregoing requirements is not to be admitted.

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- (iii) Any proprietor who manufactures or repairs parts for ships of the required length as mentioned above may become a member.
- (iv) Exceptions to the above regulations may be made upon the approval of the Navy Ministry (formerly upon approval of Communications Ministry).

The principal aim of the control society is to construct and repair ships within the framework of national planning of the Japanese Government. In order to carry this program into effect the society has also to secure the necessary raw materials and apply expert technique. The leading personnel members of the Shipbuilding Control Society include the President of the Society, the Chairman of the Board of Directors, several Directors, several Supervisors, and several Advisers. The President of the Society is appointed by the Navy Minister (formerly by the Communications Minister). The Chairman and Members of the Board of Directors are appointed by the President of the Society, but with the approval of the same Minister, who, as he sees fit, may order the dissolution of the Shipbuilding Control Society. The Society holds an annual meeting at its General Headquarters within two months following the end of each year. Provisional meetings may be called upon the suggestion of the President.

Each member organization is required to make reports to General Headquarters concerning its construction progress, the condition of ships which it is repairing, the nature of the furnishings of its ships, establishment of new branches or various changes, relating to the ships themselves, labor,



capital, and planning. (see Appendix LV.f for a list of members of the Shipbuilding Control Society.)

d. Local Associations (Kumiai) in Wooden Shipbuilding.

At the outbreak of war, Japan's wooden shipbuilding industry consisted of over 3,000 yards, most of them employing less than ten workers and building small vessels by traditional handi-craft methods. To unify and expand them to an industry capable of building a cargo fleet of significant dimensions has meant a drastic reorganization of the industry.

The first step was the forced consolidation of these yards under centralized government control. The 3,000 yards were reduced by merger to 600 and these in turn organized into 41 local associations, or Kumiai (in all urban and rural prefectures). These wooden shipbuilding associations were further organized into one unit, the Japanese Federation of Wooden Shipbuilding Associations.

Quotas of wooden vessels designed according to standard specifications were then allotted to each firm by the Japanese Federation of Wooden Shipbuilding Associations (later merged in or affiliated with the Shipbuilding Control Society under the "New Economic Structure"), under the direct control of the Ministry of Communications (later probably under the Navy Ministry). The Navy, which controls steel ship construction, was given supervisory power over the building of vessels under fifty meters, as well as the control over the supply of engines and fittings. Quotas of materials, machinery, tools etc., were allocated under the national economic mobilization plans. Low-cost financing and bonuses for production afforded financial incentives.



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4. Corporate Structure and Principal Activities of Individual Leading Companies.<sup>1</sup>

a. Mitsubishi Jukogyo. Mitsubishi Jukogyo has already been discussed in Chapter II, in connection with the aircraft industry; this organization was in every branch of war production ~~so far as industry is concerned.~~ It is also the leading company in the shipbuilding industry in Japan. Current estimates credit it with just a 30% percent of all merchant shipbuilding in Japan proper. (See Table 22.) It is worth recalling that the Chairman of this company, SHIBA Koshiro, is also the president of the Shipbuilding Control Society, a key body for the allocation of raw material priorities in this industry and its leading integrating organ. The company has a number of different installations throughout Japan which we will discuss below.

(i) Nagasaki. The Nagasaki plant is located on the northwest shore of Nagasaki Harbor and occupies an area extending from Nishidomare Bay to Akunoura. The plant consists of two principal units, The Tategami Shipyard and the Akunoura Engine Works.

This plant engages in every branch of shipbuilding and engineering and undertakes the design, construction, and repair of any type of merchant or naval vessel. The Engine Works construct Diesel engines, steam turbines, steam reciprocating engines, cylindrical and water tube boilers, pumps, condensers, feed water heaters, steam and electric winches, electric generating plants, steam and electric locomotives, heavy steel castings and forgings,

1. Appendix IVg should be referred to in connection with this section for supplementary summary material.

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water pipes, etc. There is a metallurgical plant at the works. In 1936 - 1938 the Engine Works was credited with approximately 10 percent of marine engine production in Japan. The Shipyard and Engine Works together employed not less than 15,000 persons in 1943.

Beginning in 1941 - 1942 merchant construction was limited to the construction of large tankers of 10,000 reg. tons and medium tankers of 5,200 reg. tons. It is not known whether these particular limitations have been discontinued. Two shipbuilding ways appear to have been used for each type of tanker.

Recent naval construction included the following:

1942 - Three destroyers, the Suzutsuki, Niizuki, Wakatsuki  
One cargo ship, the Ashizuri  
One auxiliary, the Shioya

1943 - One aircraft carrier, the Amagi, one CVE, the Kaiyo  
One destroyer, the Shimozuki  
Six escort vessels, #8, #10, #18, #20, #22, #24  
Nineteen patrol torpedo boats (PT's), #451 - #469

1944 (through 10 May) - Four escort vessels, #26, #28, #30, #32  
Seven PT's, #484, #490  
Twenty-one PT's, #801 - #810, #820 - #830

There are six shipbuilding ways:

Way No.	Length (Feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type <sup>a</sup>
1	450	7,000	3,000	CL
2	450	7,000	3,000	CL
3	650	28,000	10,000	CA
4	650	28,000	10,000	CA
5 <sup>b</sup>	805	28,000	40,000	BB or CV
6 <sup>b</sup>	805	28,000	40,000	BB or CV

- a. See Table 9 for meaning of abbreviations of ship types used here.  
b. Capable of building larger merchant vessels.



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(ii) Yokohama Dockyard of Kanagawa Prefecture. The Yokohama Dockyard in Kanagawa /has constructed merchant and passenger vessels displacing up to 18,000 tons and is capable of building naval vessels, including aircraft carriers and cruisers. It is an important ship repair yard. On 1 January 1943 approximately 6,000 workers were employed at this yard.

Beginning in 1941 - 1942 merchant ship construction was limited to building of standard medium tankers of 5,000 reg. tons and type "C" freighters of 2,700 reg. tons.

Naval construction 1941 - 1943 included the following:

From March

1941 - Two escort vessels, #22 and #25  
One minelayer, CMC Ishizaki

1942 - One minesweeper, AM #30

Two auxiliaries, the Sunosaki and Takasaki

Through 5 April

1943 - One minesweeper, AM #33  
One transport, AP 1.

There are five shipbuilding ways:

Way No.	Length (Feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	350	4,000	1,500	DD
2	500	10,000	3,500	CL
3	580	15,000	5,000	CL
4	580	15,000	5,000	CL
5	710	28,000	32,000	BB or CV

Kobe

(iii) Kobe, Hyogo Prefecture. This shipyard builds vessels of medium tonnage. Previously the yard was principally engaged in ship repair. It is not known to what extent it continued to engage in repair.

Besides shipbuilding, the works is capable of constructing floating docks

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of 12,000 tons, floating cranes, pumps, refrigeration plants, etc. The machine building units turn out Diesel engines, turbines, boilers, and other vessel equipment.

In 1943 approximately 8,000 persons were employed.

There is an electric manufacturing unit within the shipyard compound. It furnishes the shipyard with electrical machines and appliances and probably is able to supply outside industries as well.

Naval construction stresses submarine building and includes the following:

- 1941 - Three I-type submarines
- 1942 - One I and four RO type submarines
- 1943 - Six RO and two I type submarines
- 1944 (through March) - Three I type submarines

There are four shipbuilding ways:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	400(420)	5,500	2,000	DD
2	400(420)	5,500	2,000	DD
3	400(420)	5,500	2,000	DD
4	335(348)	4,000	1,500	DD, CM

Shimonoseki

(iiii) Shimonoseki, Yamaguchi Prefecture. The/yard is principally

a ship repair yard but also engages in the construction of small merchant and naval vessels. Many fishing vessels and tugs have been built here. It is reported that there are about 900 workers at this yard.

Beginning in 1941 - 1942 merchant ship production was limited to building small tankers of 1,000 reg. tons.

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Naval construction included the following:

1942 - Two minelayers, SpCM #7 and #8  
Two minesweepers, Sm AM's #13 and #14

1943 - One minesweeper, SPAM #21

There are at least three and possibly four shipbuilding ways.

Way No.	Length (Feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	230	1,500	700	CM, AM
2	230	1,500	700	CM, AM
3	230	1,500	700	CM, AM

b. Kawasaki Jukogyo, Kobe, Hyogo Prefecture. Kawasaki Jukogyo has already been discussed in connection with production of motor vehicles. As a shipbuilding organization it ranks second only to Mitsubishi and one estimate has indicated that its production is in the neighborhood of 15 percent of the total merchant shipbuilding in Japan proper.

Kawasaki is considered to be closely allied with the Mitsubishi interests; in 1939, Mitsubishi was listed as a minority stockholder in this company. In 1943 Sumitomo bought a controlling stock interest in Kawasaki.

In passing, reference to its president, ITANI Masasuke, is warranted since he is one of Kawasaki's links with the shipping industry, being an advisor to the Yamashita Kisen (Steamship Company) and the auditor of Toa Kaiun (Marine Transport). Kawasaki's Managing Director is Vice Admiral (Retired) YOSHIOKA Yasusada, who among his other positions is an instructor of the Naval Engineering School and the Naval Staff College, Chief Engineer of the 1st Torpedo Squadron, and Chief of the Sasebo Naval Arsenal. As in

I. Held either recently or concurrently.

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the case of Mitsubishi and other firms having naval men as executives, the intimacy with the services is repaid through favors from the Navy Ministry, the official supervising organ of the shipbuilding industry. Kawasaki lists among its directors, Baron IWAKURA Michitomo (member of the House of Peers). Among his other activities, Iwakura is also an adviser of Japan's former totalitarian party, the IRAA. Finally, Company Advisor is Baron GO Seinosuke (member of the House of Peers), who is president of the Japanese Economic Federation, a body which was largely responsible for Japan's "new economic structure", its comprehensive cartel-like wartime economic organization. Such an amalgam of interests and personnel as is exhibited by Kawasaki, including heavy industries, shipbuilding, aircraft manufacturing, affiliation with the leading semi-official cartels, with the services, with the aristocracy, and with political leadership, is symptomatic of the general fusion of interests and hierarchies which controls the policy and destiny of the nation.

The Kawasaki Shipyard and Engine Works at Kobe (Hyogo Prefecture) ranks among the largest ship and engine construction works in Japan. The yard has built battleships, carriers, cruisers, destroyers, submarines, tankers up to 15,000 tons, and large and small mercantile vessels. The machine works constructs turbines, internal combustion engines, boilers, and other vessel equipment. This shipyard has its own metallurgical plant. In April of 1943 nearly 14,000 persons were employed.

Beginning in 1941 - 1942 merchant ship construction was limited to building standard "B" type cargo vessels of 4,400 reg. tons. It appears that four shipbuilding ways were used in "B" type vessel construction. Recent



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Naval construction includes the following:

1941 (since February) - One I-type submarine  
One cargo vessel, the Irako

1942 - Two I and eight RO type submarines

1943 - One aircraft carrier, the Taiho  
Three I and six RO type submarines

1944 (through March) - Two I type submarines

There are seven shipbuilding ways:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	530	7,000	3,000	CL
2	535	7,000	3,000	CL
3	615	20,000	7,500	CA
4 <sup>a</sup>	960	28,000	45,000	BB
5	590	20,000	7,500	CA
6	480	7,000	3,000	CL
7	550	15,000	5,000	CL

a. Capable of building larger merchant vessels.

(c) Osaka Tekkosho (Now Called Hitachi Zosen, Hitachi Shipbuilding)

Osaka Tekkosho was established in 1934, with an authorized and paid up capital of ¥ 30,000,000 and total assets of ¥ 90,842,000. This third largest merchant shipbuilder in Japan is owned 100 percent by Hitachi Seisakusho. Since Hitachi in turn is controlled by Mangyo (see Chapter III), Osaka Tekkosho is, to all intents and purposes, a subsidiary of the Manchurian Industrial Development Corporation.

The proportion of merchant shipbuilding in Japan proper accounted for by Osaka has been roughly estimated at about 14 percent.

1. The home companies of Mangyo were recently reported to have come under the control of Mitsui (Chapter II).

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Osaka Tekkosho operates a number of shipyards whose activities may be summarized as follows.

(i) Hiroshima Prefecture, Habu, Innoshima. Habu The shipyard is the principal shipyard of the Osaka Tekkosho. In 1943 all six shipbuilding ways appeared to be used in construction of merchant ships. This plant was limited to building colliers and ore carriers of 5,300 reg. tons and type "C" merchant vessels of 2,700 reg. tons.

The machine shops construct marine engines and manufacture ships' fittings. This shipyard does not appear to have engaged in naval shipbuilding. In 1943 approximately 7,000 workers were employed.

There are six shipbuilding ways.

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	500	10,000	3,500	CL
2	500	10,000	3,500	CL
3	500	10,000	3,500	CL
4	375	4,000	1,500	DD
5	375	4,000	1,500	DD
6	380	4,000	1,500	DD

(ii) Hiroshima Prefecture, Mitsunosho (Sannosho) Innoshima. The Mitsunosho shipyard is located on the southeastern shore of Innoshima and comprises more or less of a unit with the above yard at Innoshima.

Beginning in 1941 - 1942 shipbuilding at this yard was limited to the construction of standard "C" type merchant vessels of 2,700 reg. tons. The yard did not appear to engage in naval construction.

In 1943 approximately 800 persons were employed.

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There are two shipbuilding ways.

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	384	5,500	2,000	DD
2	384	5,500	2,000	DD

(iii) Osaka Prefecture, Konohama Ku, Sakurajima, Osaka. The Sakura-

shipyard engaged in the construction of freight and passenger vessels, whalers, oil tankers, fishing vessels, tugs, launches, dredges, ferry boats, barges, and trawlers. Apart from shipbuilding the works engage in the production of bridge girders, construction girders, iron towers, large storage tanks, water pipes, steam engines, boilers, internal combustion engines, presses, agricultural machinery, railroad cars, mine equipment, etc. In January, 1943, there were approximately 5,000 persons employed at this yard.

Beginning in 1941 - 1942 merchant ship production was limited to the construction of medium tankers of 5,000 reg. tons and type "E" merchant vessels of 830 reg. tons. It is noted that the regular limitation has been observed. Two shipbuilding ways appear to have been used for the construction of the tankers and one way for the building of type "E" vessels.

Naval construction included the following:

1941 - One minelayer, CMC Saishu  
Two minesweepers, Sp AM's #1, #2  
One escort vessel, SC #21

1942 - Two minelayers, Sp CM's #3 and #5  
One minelayer, CMC Nuwajima  
Two escorts, Etorofu and SC #42  
One cargo ship, the Hayasaki

1943 (through March) - One auxiliary, Arasaki  
One escort vessel, Mutsure

1. A second and much smaller yard at Osaka, called the Chikko Yard, may be regarded as part of the above.



There are five shipbuilding ways:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	305	3,000	1,500	DD
2	600	20,000	7,500	CA
3	560	15,000	5,000	CL
4	505	10,000	3,500	CL
5	510	10,000	3,500	CL

(d) Tama Zosen Sho, Okayama Prefecture, Hibi Cho, Tama. Established in 1937<sup>1</sup>, Tama has an authorized and paid up capital of ¥ 10,000,000 and total assets as of March 1940 of ¥ 53,799,000. Of its 200,000 shares, 198,600 are held by Mitsui Bussan. A rough estimate indicates that Tama produces about 7 to 10 percent of the total merchant shipbuilding in Japan proper. Tama's President is Sokei Ukai, who has been with Mitsui Bussan since 1917. One of its directors is Torasaburo Furukawa, who has been manager of the shipping department of Mitsui Bussan Kaisha since 1926 and a representative director of the same firm since 1939. Among his other activities, he was a delegate of the Japanese Maritime Employers to the Geneva General Conference of the ILO in 1936. He also holds office as President of Toyo Marine Transportation Company and the Japanese Shipping Exchange at Kobe. Finally, he is a director of the leading shipping company, Toyo Kisen Kaisha, and a member of the Imperial Marine Association.

Tama's activities may be summed up in the following manner:

The works have constructed passenger vessels, all types of merchant ships, trawlers, dredges, tugs, motor boats, pontoons, steel barges, floating

<sup>1</sup>. As a separate operating company -- for the yard itself dates back a number of years as part of Mitsui Bussan.



cranes, etc. RO-type submarines, minelayers, and escort vessels have been constructed for the Navy at this ship yard.

The engineering works manufactures B & W Diesel engines, boilers, pumps, tanks, pipes, structural steel, Obertz rudders, etc. Casting, forging and welding are done on the premises. The yard employed about 8,000 persons in January 1943.

Beginning in 1941 - 1942 merchant ship construction was limited to building standard "B" vessels of 4,400 reg. tons.

Five shipbuilding ways appear to have been used in this construction.

Naval construction at this yard includes the following:

1941 (from May) - One escort, SC #20  
 One minelayer, CMC Hoko  
 One RO-type submarine

1942 - One escort, SC #33  
 One minelayer, CMC Niizaki  
 One RO-type submarine

1943 - Three RO-type submarines  
 One escort vessel, Manju

1944 (through May) - One RO-type submarine

There are six shipbuilding ways:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	600	20,000	7,500	CA
2	600	20,000	7,500	CA
3	650	28,000	10,000	CA
4	600	20,000	7,500	CA
5	520	10,000	3,500	CL
6	485	10,000	3,500	CL



(e) Harima Zosen Sho, Hyogo Prefecture, City of Omachi, Honshu.

Harima Shipbuilding was established in 1929 and in June 1940 was reported to have a paid up capital of ¥ 10,000,000 and assets of ¥ 40,798,000. No information is available regarding either the ownership or shareholders of this company. However, its president, Kanaemon Tamiya, is also President of Kobe Seikoshu (Kobe Steel Works) reported to be one of the largest steel manufacturers in Japan and a member of the Steel Materials Association. Among its directors is found Junichi Morimoto, also a Director of the Kobe Steel Works and closely connected with the Taiwan Ginko (Bank of Taiwan).

This shipyard builds and repairs ships, manufactures steam engines, steam boilers, machinery and parts, and engages in structural steel and bridge work. In January 1943, there were about 5,500 persons employed at this yard. Beginning in 1941 - 1942 merchant construction was limited to building large oil tankers of 10,000 reg. tons and standard type "C" freighters of 2,700 reg. tons.

It appears that two shipbuilding ways have been used in the construction of tankers and one building way in the construction of the freighters. Recent naval construction includes the following:

1941 - Two escort vessels, #23, #29

1942 - Two minesweepers, AM #24, #21  
One escort vessel, SC #39  
One auxiliary, the Kazahaya

1943 - One mine sweeper, AM #27  
Two auxiliaries, Hakachi and Hayasui

1944 (through 10 May) - One escort, Escort #130



There are five shipbuilding ways.

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	560	15,000	5,000	CL
2	560	15,000	5,000	CL
3	540	15,000	5,000	CL
4	540	15,000	5,000	CL
5	350	4,000	1,500	DD

(f) Tsurumi Seitetsu Zosen Sho (Nippon Kokan). Tsurumi is a direct subsidiary of Nippon Kokan (Japan Steel Company). Nippon Kokan, which was established in 1912, greatly expanded production prior to the war. In 1941, it was reported that its capital was ¥ 143,000,000 and that it was soon to be increased either to ¥ 250,000,000 or ¥ 300,000,000. After that, permission was given for the former figure. Although Kawasaki Jukogyo, Mitsubishi Shoji (Trading), and Yasuda are among the larger stockholders, Tsurumi is most frequently referred to as an Asano company. Nippon Kokan, in its various installations, accounts for 7 percent of Japan's total merchant tonnage.

(i) Tsurumi Ku, Yokohama. The <sup>Yokohama</sup> <sup>of Nippon Kokan</sup> /shipyard/ was founded in 1920 on the premises of the Asano Company. The yard has built ocean-going tankers, colliers and ore carriers, and other types of merchant vessels. Cruisers are reported to have been constructed here and in 1922 the aircraft carrier Hosho was built at this shipyard. Recent naval construction has been limited to building minelayers and escort vessels.

Aside from building ships, marine engines, and boilers, etc., the plant produces bridge girders, metal frames for buildings, steel piping, etc. There are over 3,500 persons employed. There is a large metallurgical plant adjacent to the shipyard. This plant supplies the shipyard with steel and iron prefabrications, and all types of castings and forged pieces. The annual



production of the metallurgical plant included 220,000 tons of cast iron, 200,000 tons of steel, and 276,000 tons of forged pieces.

Beginning in 1941 - 1942 merchant ship construction was limited to building standard colliers and ore vessels displacing 5,300 tons.

Recent naval construction included the following:

1941 (from March) - One minelayer, CMC Takashima  
Two escort vessels, SC #18 and #26

1942 - One minelayer, CMC Yurijima  
Two escort vessels, SC #38 and the escort Sado

1943 - One minelayer, CMC Maijima  
Four escort vessels, Mikura, Miyaki, escorts #5 and #7

1944 - (through May) - Eleven escort vessels, escorts #13, #15, #17, #19, #25.

Six shipbuilding ways are known to exist. The existence to two additional ways, #5 and #6, requires confirmation:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	595	10,000	3,500	CL
2	595	10,000	3,500	CL
3	595	10,000	3,500	CL
4	595	10,000	3,500	CL
7	595	10,000	3,500	CL
8	595	10,000	3,500	CL
5	620	15,000	5,000	CL
6	620	15,000	5,000	CL

(ii) Yokohama Prefecture, Kanagawa Ku, Yokohama. second Yokohama A/ shipyard

serves as the ship repair section of Ninnon Kokan at Tsurumi. Besides engaging in ship repair this shipyard constructs small vessels; about 1,500 persons are employed.

Beginning in 1941 - 1942 merchant construction at this yard was limited



to building small oil tankers of 1,000 reg. tons.

It appears that one building way was used in this construction.

The extent to which this shipyard engaged in naval construction is not known. Some of the naval vessels listed as having been constructed at the main plant at Tsurumi may have been constructed at the Asano Dockyard branch. There are two shipbuilding ways.

(g) Uraga Senkyo K.K. Established in 1880, Uraga was reported to have an authorized capital of ¥ 15,000,000 (¥ 13,000,000, paid up) by June 1940. Its total assets were reported to be ¥ 54,341,000. Uraga is held to be closely related to Shibusawa, and it banks with Daichi Ginko, a Shibusawa bank. Yamashita, however, is the largest stockholder, with one-third of Uraga's 300,000 shares. It has been estimated that this company does 7 percent of the merchant shipbuilding in Japan proper. Aside from its shipbuilding activities, Yamashita holds heavy investments in Dai Nippon Heiki (Great Japan Munitions), one of the <sup>two</sup> largest ordnance manufacturers in Japan. Yamashita's president is Vice Admiral TERAJIMA Ken, the Chief of Staff of the Combined Fleet, Director of the Educational Bureau of the Navy, Director of the Naval Affairs Bureau and the Naval Staff Board, President of Dai Nippon Heiki (Great Japan Munitions), and also former Minister of Research and Communications in the Tojo Cabinet of October 1941. In November 1943 he was appointed to the House of Peers. Its managing director is Vice Admiral YAMAMOTO Mikinesuke, who holds the positions of instructor at the Naval Staff College, staff member of the Maizuru Naval Base, Chief of the Shipbuilding Department

1. Either recently or concurrently.



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of the Yokosuka Naval Arsenal, and Director of the Sasebo Naval Arsenal.

Uraga has two units in Kanagawa Prefecture: Dockyard #1, situated at the head of Uraga Bay, four miles south of Yokosuka Naval Base, and Dockyard #2, situated at Hamamachi near the entrance to Uraga Bay. Dockyard #1 is the larger unit.

The Uraga Dockyards have facilities for building passenger and freight vessels and all types of naval vessels up to large cruisers. The machine works constructs main and auxiliary machinery, boilers, and other equipment for ships. In January, 1943, about 6,000 persons were employed.

Beginning in 1941 - 1942 merchant construction was limited to building type "B" cargo vessels of 4,400 reg. tons.

It appears that three shipbuilding ways have been engaged in this standardized construction.

Recent Naval construction includes the following:

1941 - Two destroyers, the Akigumo and Kazagumo  
Two minelayers, CMC #1, #2

1942 - Two destroyers, the Takanami and the Kiyonami  
One minelayer, CMC #4  
One escort vessel, the Oki

1943 - Three destroyers, the Suzunami, Kishinami and the Kiyoshimo  
One escort vessel, the Kanju

1944 (through May) - One destroyer, the Yoizuki

There are six shipbuilding ways:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type	Location
1	445	7,000	3,000	CL	#1
2	615	20,000	7,500	CA	#1
3	550	15,000	5,000	CL	#1
4	440	7,000	3,000	CL	#2
5	480	10,000	3,500	CL	#2
6	370	4,000	1,500	DD	#2

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According to other information all ways except #2 are 450 feet long and can accommodate a CL.

(h) Kawaminami Kogyo K.K. Kawaminami was established in 1936. In July 1940 it was reported to have an authorized capital of ¥ 15,000,000, of which ¥ 13,000,000 was paid up. Its total assets at the time amounted to ¥ 42,849,000. Of its 300,000 shares, various branches of the present Kawaminami holding company held about one-fifth; the Yasuda Ginko and Yasuda Hozen-sha (Yasuda Bank and Holding Company) held together the next largest block of shares. The company is credited with some 5 percent of the total merchant shipbuilding in Japan. The recent activities of the company are hereby summarized.

(i) Koyagi Island, Kyushu. <sup>Koyagi Island</sup> The shipyard is important not only for its construction of standard cargo vessels but also for its strategically located repair facilities.

In 1941 - 1942 merchant vessel construction was limited to building standard type "A" vessels of 6,300 reg. tons and type "D" vessels of 1,930 reg. tons. The yard specialized in the construction of the "D" type vessels.

This shipyard did not appear to engage in much naval construction. Naval vessels constructed here in 1942 - 1943 were the escorts #44, #47, and #51.

There are six shipbuilding ways, two large and four medium. It is reported that one of the ways will accommodate ships of 20,000 tons displacement, one, a ship of 8,000 tons displacement, and four, ships of 5,000 tons.

The equipment and facilities of this shipyard are reported to have



been expanded recently. In March 1943, there were 7,000 persons employed at this shipyard.

(ii) Saga Prefecture.

Kawaminami also operates a shipyard in Saga Prefecture, city of Nishi Yamashiro, Point Ura. This shipyard is new and/in the process of expansion. was recent<sup>ly</sup>

Beginning in 1941 - 1942 merchant vessel production was limited to the construction of type "D" standard vessels of 1930 reg. tons. This limited production has been discontinued. Three shipbuilding ways are reported. Dimensions are believed to be such as to accommodate vessels of 6,000 tons.

(i) Fujinagata Zosen Sho. Established in 1923, Fujinagata had an authorized capital of ¥ 16,000,000, of which ¥ 10,000,000 was paid up in May 1940. Its total assets were then listed at ¥ 37,072,000. Fujinagata is considered to account for no more than 3 percent of total merchant shipbuilding in Japan proper, but it is a large producer of naval marine engines. Over 95 percent of its 320,000 shares is held by Jugo Ginko (Bank). Jugo Ginko (Fifteenth Bank) was taken over by Mitsui's Imperial Bank during the course of the recent war. activities.

Three shipyards are known to be operated by this company in Osaka.

The main plant is located in Sumiyoshi Ku and is on the south bank of the Kuzu River about three and one-half miles from the river mouth.

Opposite the main plant and directly across the river is the Funamachi Branch. This yard is in Taisho Ku, Funa Machi.

The third shipyard is approximately eight miles upstream from the main plant and is located in Nishi Ku, Shingenya Machi. This yard is on the west bank of the Kizu River.



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Beginning in 1941 - 1942 merchant ship production was limited to building type "C" vessels of 2,700 reg. tons.

In 1943 four out of six shipbuilding ways located at the Funamachi and Sumiyoshi plants were apparently engaged in merchant ship construction.

These shipyards also engage in naval shipbuilding and specialize in destroyer and minesweeper construction. Recent naval construction included the following:

1941 (from 5 February) - Two destroyers, the Maikaze and Makigumo

1942 - Two destroyers, the Onami and Takanami

1943 - Three destroyers, Fujinami, Asashimo, Akishimo  
Two minesweepers, #38, #41

1944 (through April) - Two destroyers, the Ume and Kuwa

There are eight shipbuilding ways:

Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type	Location
380	4,000	1,500	DD	Sumiyoshi
365	4,000	1,500	DD	Sumiyoshi
365	4,000	1,500	DD	Sumiyoshi
365	4,000	1,500	DD	Funamachi
185	1,000	500	CM	Funamachi
185	1,000	500	CM	Funamachi
185	1,000	500	CM	Shingenyamachi
185	1,000	500	CM	Shingenyamachi

(j) Hakodate Dockyard. Hakodate was established in 1896; in June 1940 its authorized and paid up capital was reported as ¥ 6,665,000 and its total assets at ¥ 15,166,000. The company is one of the lesser producers of Japan and is credited with under .1 percent of the total merchant construction.

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Hokkaido

(i) City of Hakodate, Hokkaido. Before the war the shipyard concentrated upon the construction of fishing vessels. In 1943 merchant ship construction was limited to building type "C" merchant vessels of 2,700 reg. tons. Recent reports indicate extensive building of small wooden vessels at this shipyard.

Since May, 1942, the following Naval vessels have been built:

1942 - One escort, SC #35

1943 - Three escorts, SC's #45, #49, #55

1944 (through 15 March) - One escort, SC #57

There are four shipbuilding ways:

Way No.	Length (feet)	Merchant Vessel Cap. (Est. Gross Tonnage)	Naval Vessel Cap. (Est. Displacement Tonnage)	Naval Vessel Type
1	215	1,000	500	CMC
2	215	1,000	500	CMC
3	270	1,500	700	CM, AM
4	400	5,500	2,000	DD

These shipbuilding ways may have been enlarged to accommodate vessels of 5,000 tons.

In addition to the four shipbuilding ways there are a series of building platforms where ten vessels can be constructed simultaneously. These platforms accommodate vessels of 75 - 100 tons displacement.

(ii) Muroran.

The Hakodate Dockyard operates an affiliate at Muroran. The shipbuilding way capacity for this yard is not known but it is presumed that vessels up to 3,000 tons can be built. The yard is reported to build ship accessories for shipyards in Nagasaki, Uruga, and Hakodate.

The extent to which this yard engaged in naval construction is not known. Some of the escort vessels listed as being built at Hakodate may have been built at Muroran.

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(k) Tokyo Ishikawajima Zosen Sho. Established in 1889, Ishikawajima was reported to have an authorized capital of ¥ 32,000,000 in May 1940, of which ¥ 20,000,000 was paid up. Total assets were listed at ¥ 78,553,000. This company, as Hakodate, also accounted for only a fraction of 1 percent of total merchant shipbuilding in Japan proper. While the largest stockholder in this company has been a trust company, Tsurumi Shoken, Mitsui, and its subsidiaries, together ran it a close second. Recent information indicates that Mitsui has secured a controlling interest. Its president is Vice Admiral Kikuo Matsumura (Retired), a Director of Ishikawajima Kokuki Kogyo (Aircraft Company) and Jidosha Kogyo K.K. (Auto Industry). Its activities may be summed up as follows:

There are two shipbuilding plants operated by this company in Tokyo:

One located in Kyobashi Ku, 54 Tsukijima Cho, and the other

located in Fukagawa Ku, on reclaimed land adjoining the Susaki airport.

(i) Kyobashiku. The yard at Kyobashi Ku is one of the largest marine engine builders in Japan. It manufactures large turbines and machinery for capital ships. The yard also builds and repairs small naval vessels. It is believed that a metallurgical plant is located at this yard. In 1942-1943 this shipyard was chiefly engaged in the construction of minesweepers and escort vessels.

Construction included the following:

1942 - Two mine sweepers, #22 and #23  
One escort, #36

1943 - Two mine sweepers, #29 and #30

1944 (through May) - One mine sweeper  
One escort vessel, Escort #34

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There are three or possibly four shipbuilding ways, but their dimensions are not known (probably small). One source states that the total capacity of the ways is 11,200 tons.

(ii) Fukagawa Ku. Beginning in 1941 - 1942 merchant shipbuilding at the yard in Fukagawa Ku was limited to construction of type "B" vessels of 4,400 reg. tons.

It appears that two building ways have been used in this construction.

There are three (possibly four) shipbuilding ways, but their exact dimensions are not known (probably small). One source estimates the total capacity of the three ways to be approximately 24,000 tons. These two shipyards together employed approximately 3,000 workers in 1937.

5. Naval Shipyards. A brief account of the activities of the Naval Shipyards is required to complete the picture of shipbuilding in Japan. They are four in number and a summary of each follows. (Additional information is contained in Appendix IVa.)

Kure Naval Shipyard

(a) Kure Naval Shipyard. The / is the largest Naval shipyard in Japan. It builds, outfits, and repairs all types of vessels.

There is one shipbuilding drydock and three building ways:

	Capacity - Displacement Tonnage	Type of Naval Vessel
Building Dock	45,000	BB or CV
Way #1	1,500	DD -- CM
Way #2	2,000 - 3,000	DD -- CL
Way #3	2,000 - 3,000	DD -- CL

Naval vessels constructed at Kure include the following:

1940 - The battleship Yamato

1941 - Four I-type submarines



1942 - One CVE, the Chuyo (converted from the Niita Maru)  
 Seven I and two RO type submarines  
 Two minesweepers, AM #25 and #28  
 One CL, the Oyoda

1943 - One CA, the Ibuki  
 One CVE, the Jingo (converted from the Sharnhorst)  
 One CV, the Katsuragi  
 Two I type submarines  
 Two PI's, #349, #350  
 Nine Hayabusa Boats, #58 through #66

1944 (through April - One I type submarine  
 Three PT's #355 through #357  
 Thirty-two Hayabusa Boats, #74 through 100, #201 through #203,  
 #212 and #213

Yokosuta Naval Shipyard

(b) Yokosuka Naval Shipyard. The / is credited with approximately

20 percent of total Japanese naval shipbuilding production, and has complete facilities for the construction and repair of every type of vessel. The annual building capacity of the yard is reported to consist of one battleship, one 10,000 - 20,000 ton cruiser, two or three vessels of 10,000 tons or less, and three to six submarines. Approximately 11,000 persons were employed at the shipyard.

Recent construction included the following:

1942 - One CL, the Noshiro  
 Four I type submarines

1943 - One CV, the Unryu  
 Four I type submarines  
 Six escort vessels, #2, #4, #6, #12, #14, #16  
 Forty-nine PT's, #201 through #249  
 Seven Hayabusa Boats, #10 through #16

1944 (through 24 April) - One DD, the Take  
 Two I type submarines  
 Fifteen PT's, #263 through #277  
 Sixteen Hayabusa Boats, #17 through #32

There are at least three shipbuilding ways and probably a fourth.



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Way No.	Approx. Length (feet)	Capacity	Remarks
1	1,026	BB, CV	
2	754	CA, BB	
3	387	DD, SC	
4 (?)	505	DD, SS	Existence not confirmed

Another source reports an additional fifth way capable of accommodating a battleship or carrier. The existence of the fifth way has not been confirmed.

(c) Sasebo Naval Shipyard - Nagasaki Prefecture. Sasebo Naval Shipyard can build vessels up to the size of heavy cruisers. The engineering department is believed to be producing turbines, engines, boilers, and other machinery, gun mounts, and shell casings. It is reported that 200 - 300 aircraft engines were constructed here per year. Naval vessel construction since 1941 includes the following:

1941 - One CL, the Agano  
One I type submarine

1942 - One CL, the Yahagi  
Three I type submarines  
Two RO type submarines

1943 - Five I type submarines.  
Forty-nine PT's, #401 through #450

1944 (through 10 May) - Thirteen PT's, 470 - 483  
Eight PT's, 493 - 500  
Nine PT's, 811 - 819

There are three shipbuilding ways:

Way No.	Capacity	Naval Vessel Type
1	DD	
2	CL	
3	CL	

This yard is estimated to account for approximately 12 percent of

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the known building capacity of Japan's navy yards. Approximately 10,000 persons were employed at the shipyard.

(d) Maizuru Naval Shipyard. In 1943 the maximum annual building capacity of Maizuru Naval Shipyard was estimated to be 30,000 tons.

There are reported to be six shipbuilding ways, two capable of building pocket battleships, two that can accommodate heavy cruisers, and two for light cruisers. Four to five thousand persons were employed. Recent naval construction has emphasized destroyer and PT building and includes the following:

1941 (since February) - Three destroyers, the Yugamo, Akitsuki and the Makinami

1942 - Four destroyers, Hatsuzuki, Shimakazi, Hayanami and one other

1943 - Four destroyers, Okinami, Hayashimo, Fuyuzuki, and Matsu  
Sixteen PT's, #501 through #516

1944 (through January) - One destroyer, the Momo  
Twelve PT's, #517 through #528

#### 6. Conclusions Concerning Control of Japanese Shipbuilding Industry.

From the foregoing it emerges that Japanese shipbuilding activities have been concentrated in the hands of a few large concerns. While the analysis of corporate relationship is far from complete, a very good general view of the control picture may still be obtained. This may be had at a glance from Table 22, which indicates percentage-wise, the relative strengths of the few main parent companies, building merchant ships and engines and, crudely, the tonnages controlled by each. (See also Appendix IVg.)

By and large those large combines which are most prominent in the control of the aircraft and motor vehicle industries are also outstanding here. At the same time, militarists holding the topmost directorial posts are even more numerous. A quick preliminary survey of the directors of the few largest

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TABLE 22

## CONTROL OF JAPANESE MERCHANT SHIPBUILDING, SHIPPING TONNAGE, AND MARINE ENGINES

Percent of	Mitsubishi	Sumitomo (Kawasaki)	Mangyo	Mitsui	Asano (Nippon Kokan)	Yamashita	Total
Merchant Shipbuilding (est. 1944)	Mitsubishi Jukogyo 30%	Kawasaki Jukogyo 14%	Osaka Tekkosho 14%	Tama Zosen-sho 9%; K.K. Others, 1% Fujinagata Zosen-sho 3%	(formerly Tsurumi Seitetsu Zosen-sho) 7%	Uruga Senkyo 7%	83%
Merchant Shipping Tonnage (early 1944)	Nippon Yusen Kaisha; Toa Kaiun; Mitsubishi Shoji 30%	Osaka Shosen Kaisha; Toa Kaiun 24% Kawasaki Kisen Kaisha 5.5%	Nissan Kisen 5%			Yamashita Kisen Kaisha 8%	72.5
Merchant Marine Engines (1938)	Mitsubishi Jukogyo 22% (3 plants)	Kawasaki Jukogyo 18%	Osaka Tekkosho 5%	Tama Zosen-sho 10%; (Hakodate Senkyo 0.9%)	Tsurumi Seitetsu Zosen-sho 3%	Uruga Senkyo 3%	61.9%
Naval Engines (1936-1939)	Mitsubishi Jukogyo 11.2%	Kawasaki Jukogyo 18.6%		Tokyo Ishikawajima Zosen-sho 1.4%		Uruga Senkyo 13.3%	44.5 <sup>a</sup>

**Note:** If the reported control of Mangyo's home companies by Mitsui is confirmed (see Chapter II, p. 59), the Mangyo interest would be placed under Mitsui. This would leave control of shipbuilding and shipping in the hands of 5 combines: Mitsubishi, Sumitomo, Mitsui, Asano, and Yamashita.

<sup>a</sup>/ This total percentage indicates greater concentration (75 percent of total) if one considers private builders alone, for, in the period 1936-39, as much as 40 percent of naval engines were built in the Government Navy Yards themselves.

IV-294

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companies reveals four Admirals, several members of the House of Peers, an adviser of the IRAA, a former Cabinet Minister, two directors of naval arsenals, various instructors in naval colleges, a member of the Naval Affairs Bureau, one Chief of Staff of the Combined Fleet, a Chairman of the Japan Economic Federation, and, finally, the Chairman of the Shipbuilding Central Society. This picture should make it quite clear to those who are familiar only with the American type of industrial organization that they are dealing with a vastly different affair. Appendix IVc indicates that the same combines which controlled the bulk of shipping and shipbuilding in Japan proper also figured most prominently in shipbuilding activities in the occupied areas.

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## APPENDIX IV a

KEY PRIVATE AND NAVAL SHIPBUILDING YARDS  
IN JAPAN PROPER, SHANGHAI, AND HONG KONG

NAME	LOCATION
Kawasaki Dockyard	Kobe
Mitsubishi Shipyard and Engine Works	Nagasaki
Mitsui Tama Shipyard	Tama
Mitsubishi Yokohama Dockyard	Yokohama
Harima Shipyard	Harima
Kure Naval Shipyard	Kure
Yokosuka Naval Base	Yokosuka
Sasebo Naval Dockyard	Sasebo
Maizuru Naval Base	Maizuru
Cosmopolitan Dock	Hong Kong
Kowloon Dockyard	Hong Kong
Taikoo Dockyard	Hong Kong
Kiangnan Dock and Engine Works	Shanghai
Kiousin Docks	Shanghai
Yangtzepoo Docks	Shanghai

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## APPENDIX IV: b

TONNAGE DESIGNATIONS AND SIZE DEFINITIONSTONNAGE DESIGNATIONS

Displacement tonnage is a weight measurement usually applied to warships to denote their size. Displacement tonnage represents the total weight of the ship including load, expressed in long tons (2,240 pounds).

Gross tonnage is a space measurement used to denote the size of a merchant vessel rather than its carrying capacity. Gross tonnage represents the total number of feet of enclosed space in a ship divided by 100.

Net tonnage is the tonnage of a ship remaining after certain deductions have been made from the gross tonnage expressed in tons of 100 cubic feet to the ton.

Register tonnage is applicable to both gross and net; in other words it can be expressed as gross register tonnage or net register tonnage. In this report register tonnage is applicable to gross tons.

Information regarding naval vessels constructed since early 1941 is taken from an enemy source believed to be reliable.

The dates with naval vessels indicate the time when the vessel was under construction and not the date when the vessel became operational.

SIZE DEFINITIONS OF BUILDING WAYS AND DOCKSFor Merchant Shipyards:

Small--Under 375 feet

Medium-375-450 feet

Large--Over 450 feet

For Naval Yards:

Small--under 400 feet

Medium--Between 400-600 feet

Large--Over 625 feet

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APPENDIX IVc

WOODEN SHIPBUILDING YARDS IN JAPAN AND JAPANESE-CONTROLLED AREAS

JAPAN, KOREA, AND THE KWANTUNG LEASED TERRITORY

Political Districts (ken, fu, to, cho)	Name of Company	Chief Subscriber	Specific Location	Capitalization	Remarks
Hokkaido.	Kita Nippon Mokuzosen Kaisha				Began production March 1943
	Funaya Zosen	Mitsui	Hakodate-shi	500,000	
	Wooden Shipyard	Oji Seishi Higashi Nippon Kisen Hakodate Senkyo Kuribayashi Shosen	Hakodate-shi	5,000,000	
Aomori*	Aomori Ken Zosen Kaisha		Aomori-shi	3,000,000	Began production May 1943
	Wooden Shipyard	Mitsui	Hachinohe-shi		Enlarged during 1943
Akita	Akita Zosen		Tsuchizaki Minami Akita-gun Noshiro-machi Yamamoto-gun Funakawa-machi Minami Akita-gun Hirazawa-machi Yuri-gun	3,000,000	Began production May 1943
	Wooden Shipyard	Matsushita Denki Company	Noshiro		

\* Centers in the government's wooden shipwright training program.

IV-299-

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Appendix IV (Continued)

Iwate*	Tohoku Kogyo Iwate Zosen Tekko		Miyako-shi	1,000,000	
	Ofunado Zosen Sho		Ofunado-machi Kesen-gun		
Miyagi*	Miyagi Mokuzen	Kawasaki	Ishimaki-shi	10,000,000	
	Wooden Shipyard		Yamanishi		Began production Spring 1943
Yamagata	Tohoku Kogyo Yamagata Zosen Tekko		Sakata-shi	3,000,000	
Toyama	Saga Shipyard				Began production Spring 1943
Ishikawa*	Shosen Hokoku Kisen	Osaka Shosen Kaisha	Nenao-shi	5,000,000	Began production Spring 1943
Chiba*	Training Center				
Tokyo	Wooden Shipyards		Tokyo-to		
Kanagawa	Wooden Shipyards		Yokohama-shi		
Shizuoka*	Training Center				
Aichi	Meitetsu Aichi Zosen			5,000,000	
Fukui	Tsuruga Zosen		Tsuruga-shi	1,000,000	
Wakayama	Kishu Zosen	Nippon Yusen Kaisha	Kushimoto	5,000,000	
		Wakayama Zosen Sho			

IV-300-

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Appendix IVc (Continued)

Political Districts (ken, fu, to, cho)	Name of Company	Chief Subscriber	Specific Location	Capitalization	Remarks
Osaka	Hinomaru Shipyard Osaka Wood & Iron Ship- building Co. and numerous other yards		Osaka		Largely turning out 300 g.r.t. class
Hyogo*	Numerous yards building wooden ships		Kobe-shi		
Okayama	7 yards building wooden ships				
Hiroshima	Chugoku Zosen	Nippon Yusen Kaisha		2,500,000	
	Nissan Zosen	Nissan	Onomichi-shi	1,000,000	
	Hamane Kisen		Onomichi-shi	4,000,000	
Kagawa	Mokuzosen Kenzo	Mitsui	Sakade-mura	10,000,000	
	Sanuki Shipyard		Takuma-mura Mito-oyo-gun		
Tokushima*	Okai (nosu) Zosenso	Okada Gum Tokushima Kogyo Okai (nosu) Zosenso	Okazaki, Muya- machi Itano- gun	2,500,000	
Ehime*	Oura Hikiage Senkyo Goshi Kaisha		Hakata-ko, Ochi- gun		
	Wooden Shipyard	Yamashita Kisen	Uwajima-shi		Began production April 1943
	Iyo Shipyard				

IV-301-  
-VI

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Appendix IVc (Continued)

Political Districts (ken, fu, to, cho)	Name of Company	Chief Subscriber	Specific Location	Capitalization	Remarks
Kochi	Shikoku Kisen Kochi Moku Zosen	Matsushita Denki Matsushita Zosen		2,000,000	
Shimane*		Mitsui	Matsue-shi		
Tottori	Yonago				
Fukuoka	Fukuoka Shipbuilding Iron and Steel Works		Wakamatsu-shi		
Oita*	Higashi Kyushu Kisen	Nippon Yusen Kaisha		3,000,000	
Miyazaki*	Tatsuma Kyushu Zosen		Tonoura	1,000,000	
Kagoshima	Umigata Zosen	Nippon Yusen Kaisha		4,000,000	
Kumamoto	Tatsuma Hachyo Zosen			1,000,000	
Nagasaki	Unzen Zosen	Nippon Yusen Kaisha		2,000,000	
	Wooden Shipyard	Nippon Yusen Kaisha	Shimabara-shi	5,000,000	Began production on May 1943
Korea*			Yalu River		
Kwantung Leased Territory			Dairen		

IV-302-

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## Appendix IVc (Continued)

MANCHURIA AND CHINA

Location	Name of Shipyard	Chief Subscriber Capitalization	Specific Location	Estimated No. of Ways	Forecast of 1944 Production	Remarks
<u>Manchuria</u>						
Antung		Antung SS Company		5	8666	Building large junk type vessels, 800 tons, known as Rising Sun (Asahi) junks. First launching June 1943. Estimated period of construction, 5 months.
Yankow (Newchang)				4	2400	Yard in production in July 1943. 150 ton type, 3-month period of construction.
<u>China</u>						
Tangku	Tangku Shipyard			2	1600	First ship 200 tons launched June 1943. 3 months to build. Yard employs 300-400 workers.
Taku				2	1600	
Tientsin	Taku-kow			2	1600	The vessels built at Tangku, Taku, and Tientsin are largely employed in transporting military cargo between Chefoo and Tsingtao.

IV-303-

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Appendix IVc (Continued)

Location	Name of Shipyard	Chief Subscriber Capitalization	Specific Location	Estimated No. of Ways	1944 Production	Remarks
Tsingtao		Asano (?) Sanko		12	9600	First ship reported completed December 1943. Company officials thinking about increasing the capital 5 to 6 times from present FRB \$3,700,000. Vessels marked #7 the highest number reported seen from this shipyard 2/44.
Shanghai						The forecasts of production for Shanghai are based on the assumption of a 150 ton type of vessel, and a 2-month period of construction.
	Whangpoo Conservancy		Just north of Changwarpang rr wharf	2	1800	
	Moller's New Yard			1	1800	
	Yangtzepoo	Mitsubishi	North bank of Wangpoo, 2/3 distance between Point Island and Soochow Creek	5	4500	
	Shanghai Dock Yard, Pootung			4	3600	

IV-304-

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Appendix IVc (Continued)

Location	Name of Shipyard	Chief Subscriber Capitalization	Specific Location	Estimated No. of Ways	1944 Production	Remarks
	Harvey's		Pootung Pt., across from Customs' Jetty	3	2700	
	Jardine Matheson		Pootung Point	1	900	
	Name not known		Soochow Creek near Jessfield Park	2	1800	
	Huh Hsing Eng. & Shipbuilding Wks. (renamed Showa)	5,000,000 yen	On French Bund	3	2700	
	Kiousin		West bank of Whangpoo above Nantao and north of French Water Works	5	4500	
	Tai-Chung-Hua		Directly across Whangpoo from Tung Chiatsu drydock	3	2700	
	Ping An	Mitsui	Pootung side just below Pailienkang Creek	3	2700	
	Dlledessen		Just below Dollar Wharf	3	2700	
	Kiangnan	Mitsubishi	West bank Whangpoo above Nantao	6	5400	
Canton		Mitsui		3	1800	First ship launched 12/9/43. Forecast is based on assumption of 150 ton type of vessel and a 3-month period of construction.

IV-305-

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Appendix IVc (Continued)

Location	Name of Shipyard	Chief Subscriber Capitalization	Specific Location	Estimated No. of Ways	1944 Production	Remarks	
	Honan or Kawanami	Taiwan Colonisation Co., up to Dec. '43. Now Kwantung Provincial Government.		3	1800		
Hongkong	Wing On Shing		Cheungshawan	2	1800	Quota set for Hongkong for 1944 - 150,000. The forecasts of production for Hongkong are based on the assumption of a 150 ton type of vessel and a two month period of construction.	
	Kwong Cheong Hing		Shamshui Po	2	1800		
	Kwong Hip Lung (renamed Dai Nippon)		Shamshui Po	5	4500		
	Cosmopolitan		Taikoktsui	3	2700		
	Name not known		Yaumati	1	900		
	Kinsun (renamed To Nam)		Hunghom	6	5400		Engine Manufacturing
Kowloon			Hunghom	3	2700		
	Bailey's		Tokwawan	7	6300		
	Name not known		Tokwawan	6	5400		
	Hip Tung Wo Eng. Co.		Mataukok			Engine Manufacturing	
	Ngauchiwan Shipyard		Ngauchiwan	8	7200		
	Fook Chen		Ngautaukok	2	1800		

IV-306-

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Appendix IVc (Continued)

Location	Name of Shipyard	Chief Subscriber Capitalization	Specific Location	Estimated No. of Ways	1944 Production	Remarks
	Ah King		Causeway Bay	6	5400	
	(Name not known)		Causeway Bay	2	1800	
	Taikoo		Querry Point	4	3600	
	(Name not known)		2000 yards east of Taikoo on promontory	2	1800	
	Aberdeen			2	1800	

IV-307-

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## Appendix IVc (Continued)

## INDOCHINA

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Companies	Location	Employment	Estimated Number of Ways	Est. Prod. Period (Mo.)	Type of Vessel (G.T.)	Forecast for 1944 (G.T.)	Sawmills	Remarks
<u>Hanoi - Haiphong Area</u>								
Mitsui Mitsubishi Ataka	Dapeau (20-56N, 106-20E) Namdinh (20-25N, 106-09E) on the Songlach Trai River, 1 1/2 km. SW of the bridge on the road connecting Kienan with Haiphong.	1000 as of April 1944	15	4	150	6,750	Important sawmills in Hanoi on the west bank of Red River, near south end of the Doumer Bridge and SE of the Lanessan Hospital. Societe de Scieries et Fabriques d'Alumettes, Hamdinh branch.	
<u>Vinh</u>								
Ataka	Between Daibeng and Thoha near mouth of Songa, 2 1/2 km. NW of Fort at Bacninh.	30 Japanese 2000 native workers, 500 wood cutters	12	5	800	20,800	Sawmill in Benthuy, reportedly owned by Mitsui. Employment choppers ("who hew planks from the tree trunks") and 2000 coolies. Largest and best equipped sawmill in Indochina at Thanhua some 80 miles north of Vinh. The Societe de Scieries et Fabriques d'Alumettes. Vinh has rail connections with Thanhua.	Due to shortage of bottoms caused by European war, the French began construction of a modified junk type of vessel about 800 g.r.t. at Vinh in 1941. The Japanese took the establishment over.

IV-308-



Appendix IVc (Continued)

Companies	Location	Employment	Estimated Number of Ways	Est. Prod. Period (Mo.)	Type of Vessel (G.T.)	Forecast for 1944 (G.T.)	Sawmills	Remarks
<u>Saigon</u>								
Mitsui Mitsubishi Banko Nishinan	Former Standard, Shell, and Texas plants at Nhabe. Yung Feng Junk Factory on Standard site bombed and reported destroyed 24/2/44. Recuperability probably high, however.	Col. Nagamine in charge of sea and river transport service in the army, in South Indochina is in charge. A Japanese chief engineer, 400 Chinese, 800 Annamites.	10	4	150	4,500	La Bienhoa Industrielle et Forestiere de Saigon  Cie Asiatique et Africaine de Saigon  Cie Forestiere Indochinoise 48 rue Richard, Saigon	
	-Hoshun yard -- 20 km. directly east of wireless serial tower, apparently on Donnai River somewhat below Bienhoa.		12	4	150	5,400		
	Cholon		10	4	150	4,500		
	Naval Arsenal on Saigon River just below intersection of Arroyo L'Avalanche, modernized during the 30's.		Marine Railroad 4	4	150	1,800		Reported that first wooden ship in Saigon was launched at Naval Arsenal, 28/2/43.
	Messageries Fluviales (on east bank of Saigon River just above intersection of Arroyo Chincis.)		Marine Railroad 1	4	150	450		

IV-309-

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Appendix IVc (Continued)

Companies	Location	Employment	Estimated Number of Ways	Est. Prod. Period (Mo.)	Type of Vessel (G.T.)	Forecast for 1944 (G.T.)	Sawmills	Remarks
Forges Ateliers et Chantiers d'Inde-Chine (Fac)	on SE bank of Arroyo Chinois just west of the 2nd bridge from the Saigon River.		Marine Railroad 1	4	150	450		
Societe de Construction de Levallois Perret	on the Arroyo-Chinois near Saigon-Cholon boundary.			4	150	2,250		
Societe Mechanique Shipbuilding Co.	at Anloi on the Saigon River.			4	150	2,250		
Shipyard	1 km. NE of Phuxuan.			4	150	2,250		
Shipyards at Cap St. Jacques and at Xeh-Chien (also called Villages des Nattes)				6	700	5,600		

IV-310-

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Table continued

Company and Yard	1936				1937				1938			
	Tons	%	H.P.	%	Tons	%	H.P.	%	Tons	%	H.P.	%
Osaka Tekkosho												
Osaka	14,071	4.6	6,000	2.1	60,264	12.2	22,606	5.0	33,759	7.3	16,000	4.2
Innoshima									14,109	3.0	3,900	1.0
Asano Zosensho	6,507	2.1	5,060	1.8								
became (1937)												
Tsurumi Seitetsu					7,276	1.4	5,630	1.2	30,210	6.6	11,188	2.9
Zosen Kaisha												
Yokohama												
Hakodate Senkyo,	3,951	1.3	3,400	1.2	3,162	0.6	4,149	0.9	6,405	1.4	3,550	0.9
Hakodate												
Fujinagata Zosensho												
Osaka	536	0.2	2,380	0.8	588	0.1	2,000	0.4	115	-	500	0.1
Ishikawajima												
Zosensho Tokyo	900	0.3	6,480	2.3	1,680	0.3	31,300	7.0		-		
Total	277,924		238,338		447,954		397,021		399,357		240,426	
Other	24,956	8.2	42,294	15.1	44,667	9.1	47,127	10.6	57,664	12.6	133,581	35.7
	<u>302,880</u>	<u>99.7</u>	<u>280,632</u>	<u>99.6</u>	<u>492,621</u>	<u>99.5</u>	<u>444,148</u>	<u>99.5</u>	<u>457,021</u>	<u>99.5</u>	<u>374,007</u>	

IV-311a-

Source: The Glasgow Herald Trade Review, December 1936, -37, -38.

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Appendix IV. a

MERCHANT SHIPBUILDING, MARINE ENGINE MANUFACTURE, JAPAN  
(Gross Tons)

Company and Yard	1936				1937				1938			
	Tons	%	H.P.	%	Tons	%	H.P.	%	Tons	%	H.P.	%
Mitsubishi Jukogyo												
Nagasaki Works	56,526		67,602		66,305		66,630		29,582		27,300	
Kobe Works	16,123		13,493		35,780		26,154		20,014		20,811	
Hikoshima Works	12,208		---		1,406		---		2,608		---	
Yokohama Dock- yard	<u>28,639</u>		<u>22,626</u>		<u>49,170</u>		<u>37,573</u>		<u>43,872</u>		<u>34,557</u>	
Total	102,496	33.8	103,719	36.9	152,661	30.9	130,357	29.3	116,076	25.3	82,668	22.1
Kawasaki Jukogyo												
Kobe	59,665	19.6	54,180	19.3	86,432	17.5	83,659	18.8	73,645	16.1	68,220	18.2
Mitsui Bussan Kaisha	48,549	16.0	44,269	15.7								
changed in 1937 to Tama Zosensho Tama					63,296	12.8	52,920	11.9	47,745	10.4	40,120	10.7
Harima Zosensho, Aioi	28,779	9.5	1,950	0.7	38,909	7.8	4,600	1.0	50,618	11.0	8,800	2.3
Uruga Senkyo, Uruga	12,470	4.1	10,900	3.8	33,686	6.8	59,800	13.4	26,675	75.8	13,400	3.5

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APPENDIX IV eINDUSTRIAL EQUIPMENT MANAGEMENT CORPORATION PLAN

The plan, simply outlined, provided that the Industrial Equipment Management Corporation alone issue orders for standardized vessels to dockyards after securing the approval of the Communications Ministry (later the Navy Ministry). Funds were to be supplied by the government for this purpose. Shipowners would buy their vessels from the Corporation and losses incurred by the agency, as a result of ensuring profits to the shipbuilders and enabling shipowners to buy vessels at a figure "whereby they might be operated without loss under prevailing freight and charter rates" would be liquidated by the government". To assist shipyards, any new capital outlay for equipment would be provided from corporation funds.

According to the Revised Industrial Equipment Management Corporation Bill which was published on 24 May 1942, all orders for ship construction were still to be placed by the corporation, with the completed units being sold to the shipping companies and all corporation losses being compensated for by the Government. To this end, the debenture issue limit of the Industrial Equipment Management Corporation was to be increased to ten times its paid up capital.

Under the Revised Shipbuilding Compensation Law which was presented to the Diet 29 May 1942, the Industrial Bank of Japan would accommodate shipowners by buying newly built standardtype vessels from the Industrial Equipment Management Corporation. The amount of these funds accommodated by 3.7 percent interest. The Wartime Financing Treasury would likewise extend easy financing on the same conditions as the Industrial Bank. In addition, engine and accessories manufacturers would be beneficiaries of these credit terms.

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## APPENDIX IV f

MEMBERS REGISTER OF THE SHIPBUILDING CONTROL SOCIETY<sup>1/</sup>

Name	Address	Telephone No.
Kabushiki-Kaisha Harima-Zosensho (Harima Shipyard Co.)	Hyogoken Akanhogun Aioicho, 5292	Aioi 14
Hakodate Senkyo Kabushiki-Kaisha (Hakodate Dockyard Co.)	Hakodateshi Bentencho, 88	Hakodate 3330
Nihon Kokan Kabushiki-Kaisha (Nihon Steel Pipe Co.)	Tokyoshi Kojimachiku Marunouchi 1 Chome, 10	Marunouchi (23) 435
Kabushiki-Kaisha Tokyo Ishigawashima-Zosensho (Tokyo Ishigawashima Shipyard Stock Co.)	Tokyoshi Kyobashiku Tsukudashimacho, 54	Kyobashi (56) 2161
Kabushiki-Kaisha Osaka Tekkosho (Osaka Iron-works Co.)	Osakashi Minamiku Nagahoribashisuji 1 Chome, 3	Minami 8831
Kawasaki Jukogyo Kabushiki-Kaisha (Kawasaki Heavy Industrial Co.)	Kobeshi Minatohigashiku Higashikawa sakicho, 2 Chome, 14	Hyogo 3880
Kawanami Kogyo Kabushiki-Kaisha (Kawanami Industrial Co.)	Osakashi Kitaku Sozemachi, 1	Dosahori 3531

<sup>1/</sup> Source: Toseikai Nenkan, Pt. II, Tokyo.



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Name	Address	Telephone No.
Kasado Senkyo Kabushiki-Kaisha (Kasado Dockyard Co.)	Kobeshi Kobeku Kaigandori, 5	Sannomiya 3538
Rosoku Senkyo Kabushiki-Kaisha (Rosoku Dockyard Co.)	Osakashi Nishiku Nagahoritori 5 Chome, 4	Tenka-Zaya 6233
Nagoya Zosen Kabushiki-Kaisha (Nagoya Shipbuilding Co.)	Nagoyashi Minatoku Showacho, 13	Minami 5679
Mukojima Senkyo Kabushiki-Kaisha (Mukojima Dockyard Co.)	Hiroshimaken Mitsugigun Mukojima- higashimura, 14755	Onomichi 87
Uraga Senkyo Kabushiki-Kaisha (Uraga Dockyard Co.)	Tokyoshi Kojimachiku Marunouchi 1 Chome, 6	Marunouchi (23) 1856
Kabushiki-Kaisha Fujinagata Zosensho (Fujinagata Shipyard Co.)	Osakashi Sumiyoshiku Shibatanicho, 44	Tenka-jaya 5631
Mitsui Zosen Kabushiki-Kaisha (Mitsui Shipbuilding Co.)	Tokyoshi Nihoubashiku Muromachi: 2 Chome, 1	Nihombashi (24) 4468
Zosen-kumiai Kanto Zosen-kyogikai (Shipbuilding Association, Kanto Shipbuilding Council)	Yokohamashi Nakaku Taidencho 2 Chome, 23	Yokohama-honkyoku 1140
Zosen-kumiai Kansai Zosen-kyogikai (Shipbuilding Association, Kansai Shipbuilding Council)	Osakashi Nishiku Kitahorietori 2 Chome, 16	Shimma chi 1867

RESTRICTED

IV-314-



RESTRICTED

Name	Address	Telephone No.
Zosen-kumiai Chugoku Zosen-kyogikai (Shipbuilding Association, Chugoku Shipbuilding Council)	Miharashi Itosakicho, 5510	Itosaki 138
Zosen-kumiai Kyushu Zosen-kyogikai, (Shipbuilding Association, Kyushu-Shipbuilding Council)	Mojishi Shambashitori, 9	Moji 3218
Zosen-kumiai Tohoku Zosen-kyogikai, (Shipbuilding Association, Tohoku-Shipbuilding Council)	Ishinomakishi Ishinomakinaks-cho 112-2	Ishimomaki 433
Chosen Jukogyo Kabushiki-Kaisha (Korea Heavy Industrial Co.)	Fuzanfu Ryusencho, 1	Fukushima 46
Taiwan Senkyo Kabushiki-Kaisha (Taiwan Dockyard Co.)	Kiirunshi Taishocho, 1	104
Tairen Senkyo Tekko Kabushiki-Kaishiki (Tairen Dockyard Iron-works Co.)	Tairenshi Hamamachi, 3	7195
Mitsubishi Jukogyo Kabushiki-Kaisha (Mitsubishi Heavy Industrial Co.)	Tokyoshi Kojimachiku Marunouchi 2 Chome, 4	Marunouchi (23) 2131
Kabushiki Kaisha Mitachi Seisakusho (Hitachi Manufacturing Co.)	Tokyoshi Kojimachiku Marunouchi 2 Chome, 12	Marunouchi (23) 2362

IV-315-

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Name	Address	Telephone No.
Kabushiki-Kaisha Kobe Seikoshō (Steel Manufacturing Co.)	Koboshi Fukuaiku Wakihamacho 1 Chome, 31	none
Tobu Hakuyonainenki Tosei-kumiai (Eastern part, Ship fuel machine Control Society)	Tokyoshi Shibaku Tamuracho 1 Chome, 3	Ginza (57) 6870
Seibu Hakuyonaineki Tosei-kumiai (Western part, Ship fuel machine Control Society)	Kobeshi Minato-higashiku Tabundori 3 Chome, 23	Motomachi 952
Tobu Hakuyo-kikai Tosei-kumiai (Eastern part, Ship machine Control Society)	Tokyoshi Honzoku Toryokuku 1 Chome, 18	Honzo (73) 460
Seibu Hakuyo Kikai Tosei-kumiai (Western part, Ship machine Control Society)	Osakashi Minamiku Mikichibashi- tori 3 Chome, 6	Funaba 5396
Nihon Mokuzosen-kokyo-kumiai Rengokai, (Nihon Wooden-ship Industrial Association Federation)	Tokyoshi Nihonbashiku-tori 3 Chome, 6	Nihonbashi (24) 411
Nihon Senyo-sakogyo-kumiai (Nihon Ship-chain Industrial Association)	Osakashi Nishiku Hondadori 1 Chome, 49-7	Nishi 2652

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APPENDIX IV gPRINCIPAL SHIPBUILDING COMPANIES IN JAPAN

Companies	Capitalization (¥ 1,000)	% of Total Capacity <sup>1/</sup>	Personnel
Mitsubishi Jukogyo	480,000	28 - 30	Chr.; Koshiro Shiba, Kiyoshi Goko, Shintaro Motara, Hara Kozo, Ing-Dirs. Kiosuke Tamai, Koyata Iwasaki, Hikoyata Iwasaki, Shigemichi Miyoshi, Noboru Otani, Tatsuzo Ito, Kiyohike Ijiuin, Kikutaro Sasamoto, Koshiro Matsui, Fukusaku Ushimaru, Naota Watanabe, Genhachi Kawai, Takeo Tato, Sobun Yamamuro, Hatsuji Muro, Masaharu Kato, Seiroku Morote, Dir. s.
Kawasaki Jukogyo	200,000	16-15	Masasuke Itani, Pres.; Yoshikuma Kawasaki, Vice Admiral Yasusa- da Yoshioka, Horiichi Matsumura, Ing Dirs; Hichitomo Iwakura, Kojuro Miwa, Dir. s.

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<sup>1/</sup> Estimates of capacity based on study of facilities

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APPENDIX IV g

Companies	Capitalization (¥ 1,000)	% of Total Capacity	Personnel
Osaka Tokkosho	30,000	14	Chr, Odaira, Homioi; (Pres. Hitachi) Saburo Rokkaku, Pres.; (Dir. Hitachi) Koreatsu Kujo, Mgr. Dir. Shunichi Kanoko, Sukeichi, Isobe, Takayuki, Ideta, Kenji Shimokobo, Bunju Ito, Chuji Nishimaki, Dir. Keisuke Yamada, Fujizo Fujiwara Inspc.

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Company	Capitalization (¥ 1,000)	% Capacity	Personnel
Tsurumi Seitetsu Zosensho (Tsurumi Steel and Shipbuilding) --now merged . . . (1940) with Nihon Kokan (Asano)	100,000	7	Chr., Shiraishi Moto Genjiro Pres.; Matsushit Nagasuke Majima Sanji, Ing. Dir.; Ota Seizo, Imaidzumi Kaichiro, Tanaka Eihachro, Ohashi Susuichi, Comptrollers.
Kawaminami Kogyo KK	15,000	5	Chr., Toyosaku Kawaminami, Pres. Tetsujuro Shinohara, Tamogiro, Tagami, Matsumoto Shigeru, Tahachiro Kawaminami, Hidezo Kawaminami, Yutaka Izukaue, Kinsaku Kawahara, Gaijiro Ueno, Nobuo Urabe, Dirs. Magohachi, Matsuo, Satoru Otsu, Inspecs.
Fujinagata, Zosensho	16,000	3	Chr., Nobuta Kishimoto, Pres.; Tsunojiro Takahashi, Yoshiaki Ogura, Hidetada Ino, Hatsuki Sasa, Kimizo Maeshima, Sakae Umura, Tora Umura, Dirs. K. Iritani, S. Otsubo, Inspecs.



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APPENDIX IV g(cont)

Company	Capitalization (¥ 1,000)	% Capacity	Personnel
Harima Zosensho	10,000	9	Chr., Tamiya, Pres.; S. Yokaw, Mng.Dir.; T.Jinko, N. Emura, M.Kamuma(?), H.Kakehashi, S.Matsuoka, Morimoto Junichi, Dirs.
Tama Zosensho	10,000	9	Chr, Sohei Ukai, Pres.; (Dir. Mitsui Torasaburo Furukawa (Dir. Mitsui Bussan), Jimbo C.Emura, K.Kainuma, H. Kakehashi, S.Matsuoko, Dirs.; S.Yokow, Mng.Dir.
Uraga Senkyo	15,000	7	Chr. Ken Terashima, Pres.; (Pres. Dai Nippon Hoiki); Mikinosu ko Yamamoto, M. Yamamoto, A. Shigomitsu, T. Amaizumi, Mng. Dir.s; M. Idachi, S. Nakagawa, Dirs.

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Company	Capitalization (¥ 1,000)	% Capacity	Personnel
Hakodata Senkyo KK	6,665	.5	Chr., I. Otsuka, Pres.; (1939) U. Wada, IngDir.; K. Oguma, T. Takahashi, T. Ishii, J. Watanabe, K. Itoh, Dirs.; Yoshio Tominaga, Pres; (1941) Koichiro Koguma, Tamotsu Takahashi, Takichi Ishii, Jiro Watanaba, Kenso Ito, Jinnojo Hayashi, Tokuichi Kurimura, Renji Nakamura, Dirs. Yoshio Kawada, Tsunejiro Hirazuka, Jokichi Tominaga, Inspec.
Tokyo Ishikawajima Zosensho	32,000	.75	Chr, Kikuo Matsumura, Pres.; Masago Isakawa, V-Pres.; I. Murata, K. Suetsune, T. Hashimoto, K. Shoji, I. Kasahara, K. Suzuki, Dirs.
Others	1.5		