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PROVISIONAL INTELLIGENCE REPORT

WESTERN EUROPEAN SHIPBUILDING FOR THE SOVIET BLOC AND ITS EFFECTS ON THE BLOC ECONOMY



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AND ITS EFFECTS ON THE BLOC ECONOMY

CIA/RR PR-60

(ORR Project 35.244)

NOTICE

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FOREWORD

This report examines the general economic effects on the Soviet Bloc, and, in particular, the economic relief afforded the Bloc shipbuilding industry, by Western European shipbuilding and ship repair for the Bloc.

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WESTERN EUROPEAN SHIPBUILDING FOR THE SOVIET BLOC
AND ITS EFFECTS ON THE BLOC ECONOMY*

Summary

The building of Soviet Bloc vessels in Western European shipyards is increasing from an average of 150,000 gross registered tons (GRT) of vessels delivered annually during 1950-53 to an estimated 208,000 GRT to be delivered in 1955. This tonnage amounts to about 20 percent of the total new tonnage of merchant ships acquired annually by the Bloc and is augmenting, particularly, the Bloc maritime and fishing fleets.

The construction of Soviet Bloc vessels in Western Europe during 1950-55, as measured in man-years, amounts to from 4 to 7 percent of the new construction labor force engaged in Soviet Bloc merchant and naval vessel production in 1952-53. The relief thereby afforded Bloc shipyards gave the Bloc the opportunity to construct an additional 10 to 50 minor combatant naval vessels (destroyers, submarines, and minesweepers) annually.

The main propulsion machinery obtained from non-Soviet Bloc sources and installed in Bloc vessels built in Western Europe did not augment Bloc production to any great extent. Hull steel inputs in these vessels were insignificant compared to total Bloc steel production.

Labor expended on repairs on Soviet Bloc vessels in Western Europe amounted, in 1952, to about 4 percent of the USSR shipyard manpower engaged in repairs to vessels. This adds materially to the relief furnished Bloc shipyards by Western European shipbuilding for the Bloc.

* The estimates and conclusions contained in this report represent the best judgment of the responsible analyst as of 1 May 1954.

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I. Introduction.

The continuing efforts of the Soviet Bloc to procure additional new vessels from Western European shipyards has received considerable publicity recently. In the last year the USSR has signed new trade agreements or placed orders in seven Western European countries other than Finland for ship construction amounting to over 130,000 gross registered tons (GRT)* of vessels to be delivered in 1954 to 1956. 1/** In Finland practically the entire output of the shipbuilding industry amounting to over 100,000 GRT per year is taken by the Bloc.*** 2/ Thus the Bloc will obtain sizable additions to its maritime and fishing fleets in the next 3 years without interrupting the naval shipbuilding programs in which most of the larger Bloc shipyards are now engaged.

II. Shipbuilding in Western Europe for the Soviet Bloc.

1. General.

To evaluate the importance of Western European shipbuilding for the Soviet Bloc both the over-all amount of construction usually reported in GRT and the principal inputs in this building, shipyard labor, hull steel, and main propulsion machinery must be examined.

Also, since the construction of a ship may extend over as long a time as 3 years, it is necessary to examine this building over a period of years. The period 1950-55 has been selected for this report, since it includes not only the most recent Soviet Bloc shipbuilding orders but also an earlier wave of construction starting about 1950. The years 1953-55 have been used, however, when earlier years are not necessary to show the trend.

* Gross registered tonnage is the total volume within the enclosed portion of the ship including deck houses (with certain minor exceptions), expressed in units of 100 cubic feet to a ton.

** Footnote references in arabic numerals are to sources listed in Appendix C.

*** All production has gone to the USSR except for one vessel contracted during 1954 for delivery to the Chinese Communists.

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2. Gross Registered Tonnage Constructed.

The amount of tonnage under construction in Western Europe for the Soviet Bloc, as published in Lloyd's Register, increased rapidly in 1950. (See Table 1.)* In September 1949, only 13 vessels totaling less than 10,000 GRT were reported as under construction, but by September 1950 the number of vessels under construction had increased to 49 vessels totaling 67,000 GRT. With some fluctuations this higher level of building has been continued through 1953, reaching a maximum of 55 vessels totaling 81,000 tons in 1951. These published figures have been found to be far from complete, particularly with respect to shipbuilding for the Bloc, because non-self-propelled tonnage was excluded and apparently incomplete reports were received from some countries.

A more complete estimate of tonnage figures for each country has been compiled from classified sources and listed in Table 2.** Table 2 indicates that all Western European countries with shipbuilding industries (except Norway, Portugal, and Spain) are engaged in building for the Bloc. The tonnage delivered each year has amounted to over 125,000 GRT and in 1952 reached a peak of 175,000 GRT. With the recent trade agreements and orders, the tonnage delivered will exceed 200,000 GRT in 1955.

3. Relative Importance of Western European Production to the Soviet Bloc.

Shipbuilding for the Soviet Bloc amounted to less than 4 percent of the 1953 Western European shipbuilding total of over 3.5 million GRT. (See Table 3.)*** Shipbuilding for the Bloc was of national economic significance only in Finland, where the USSR takes practically all of the ship production, and in Belgium and Denmark, where building for the Bloc amounted to 8 percent and 12 percent, respectively, of total production in 1953.

The estimated total tonnage of newly constructed merchant vessels built and acquired by the Soviet Bloc amounted to over 750,000 GRT in 1953 and by 1955 will reach a total of over 1 million GRT, (Table 4).**** The shipbuilding for the Bloc in Western Europe accounts for a sizable proportion of this tonnage, averaging nearly

* Table 1 follows on p. 4.

** Table 2 follows on p. 5.

*** Table 3 follows on p. 6

**** Table 4 follows on p. 7.

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Table 1

Published Numbers and GRT of Vessels under Construction for the Soviet Bloc in Non-Bloc Countries ^{3/}

100 GRT and Over

Year	Quarter	UK and Northern Ireland		Other British Commonwealth Countries		Belgium		Denmark		Finland		Italy		Netherlands		Sweden		US		Total		
		Number	GRT	Number	GRT	Number	GRT	Number	GRT	Number	GRT	Number	GRT	Number	GRT	Number	GRT	Number	GRT	Number	GRT	
1946	1																	2	292	2	292	
	2											3	600 R a/							3	600	
	3																					
	4																					
1947	1											3	600 R							3	600	
	2			4	2,800 C a/							3	600 R							7	3,400	
	3			9	11,100 C															9	11,100	
	4			9	11,100 C					6	2,782			1	800 P a/					16	14,682	
1948	1	3	2,860 P	9	11,100 C					6	2,782									18	16,742	
	2	3	2,860 P	9	12,690 C					10	7,688			2	200 P					24	23,438	
	3	3	2,860 P	5	8,830 C					9	7,620			2	200 P					19	19,510	
	4	1	1,160 P	1	3,079 C					10	7,925			4	400 P					16	12,564	
1949	1	1	1,160 P	1	3,079 C					10	6,323			2	200 P					14	10,762	
	2									10	7,745					1	600			11	8,345	
	3	1	800 C			2	3,000			7	5,122			2	200 P	1	600			13	9,722	
	4	1	3,200 P			3	5,010	1	3,075 P	8	5,903			2	200 P	3	600 P			22	21,288	
		1	800 C													3	3,100					
1950	1	2	10,800 P			7	11,150	1	4,120 P	14	12,279			2	320 P	3	800 P			35	44,319	
		1	800 C													5	4,050					
	2	3	18,400 P			8	14,050	1	3,165 P	14	10,202				1	160 P	2	600 P			36	52,027
	3	3	18,400 P			7	12,380	1	3,165 P	13	9,939	2	6,900	2	2,000	7	5,450			49	66,684	
	4	3	18,400 P			9	16,180	1	3,165 P	12	9,634	2	6,900	2	2,000	17	13,100			55	74,209	
															4	980 P						
															22	16,950						
1951	1	2	15,200 P			8	14,510			15	14,740	2	6,900	3	3,000	3	400 P			56	71,900	
	2					6	10,940	2	10,360	11	10,858	2	6,900	4	4,000	23	17,150			55	64,088	
	3					5	9,040	2	10,360	11	11,179	2	7,350	7	22,000	27	20,520					
	4					3	5,470	3	11,880	9	7,545	1	3,450	7	22,000	1	190 P			55	81,039	
															27	20,920			42	64,701		
															1	190 P						
															18	14,166						
1952	1					2	3,800	4	13,400	13	12,040			7	22,000	15	12,018			41	63,258	
	2					4	6,712	11	9,840					7	22,000	9	8,150			31	46,702	
	3					5	15,550	18	22,561					7	22,220	6	5,400			36	65,731	
	4					4	13,875	20	24,857					5	20,110	4	3,765			33	62,607	
1953	1					1	3,100	3	12,197	24	27,815			7	24,910	3	3,015			38	71,037	
	2					1	1,711	2	10,360	25	26,302			9	28,310	1	950			38	67,633	
	3					3	5,122	1	8,840	27	31,609			10	30,010	1	925			42	76,506	
	4					4	6,823	25	36,946	25	36,946			11	31,065	1	925			41	75,759	

a. Letters following the tonnage figures indicate the Bloc countries that have received the vessels. All tonnage not followed by C, P, or R was constructed for the USSR. C - China, P - Poland, and R - Rumania.

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Table 2

New Vessel Tonnage Delivered to the Soviet Bloc
from Western European Shipyards ^{4/}

<u>Location of Shipyard</u>	<u>GRT</u>					
	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Belgium	4,467	9,600	4,911	4,572	16,589	31,399
Denmark	0	3,181	14,427	14,787	5,040	3,360
Finland	120,000 (Estimated)	110,218	127,820	124,086	114,892	93,292
France	0	0	0	0	0	13,750
West Germany	0	0	0	0	0	30,000
UK	3,219	0	0	0	2,450	7,350
Italy	2,440	4,362	4,394	0	470	17,160
Netherlands	0	0	3,165	6,015	15,035	3,320
Sweden	3,193	16,003	21,186	5,086	5,450	7,900
Totals	<u>133,319</u>	<u>143,364</u>	<u>175,903</u>	<u>154,546</u>	<u>159,926</u>	<u>207,531</u>

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Table 3

Vessels Built and Delivered to the West and to the Soviet Bloc
from Western European Shipyards
1953

Country	Total GRT Delivered to the West and to the Bloc in 1953 <u>2/ a/</u>	GRT Delivered to the Bloc in 1953	Percent of Bloc Deliveries to Total Deliveries
Belgium	54,734	4,572	8
Denmark	126,813	14,787	12
Finland	128,586	124,086	96.5
France	235,121	0	0
West Germany	711,874	0	0
UK	1,250,263	0	0
Italy	164,513	0	0
Netherlands	305,648	6,015	2
Norway	107,737	0	0
Portugal	8,061	0	0
Spain	44,124	0	0
Sweden	468,776	5,086	1
Total	<u>3,606,250</u>	<u>154,546</u>	<u>4</u>

a. All figures are based on Lloyd's Register and refer to self-propelled vessels over 100 GRT except for Finland. Finnish figures include both self-propelled and non-self-propelled vessels and are not based on Lloyd's.

20 percent of the total acquired by the Bloc in 1953 through 1955. The Bloc acquired only a negligible number of vessels from non-Bloc countries other than those in Western Europe.

A breakdown by types of vessels built in Western Europe for the Soviet Bloc is shown in Table 5* for the years 1953, 1954, and 1955.

* Table 5 follows on p. 8.

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Table 4

Vessels Acquired, Built, or Under Construction
in the Soviet Bloc 6/
1953-55

	GRT		
	<u>1953</u>	<u>1954</u>	<u>1955</u>
USSR	407,500	480,000	512,000
Czechoslovakia	25,500	27,700	29,900
East Germany	120,000	131,000	134,000
Hungary	26,100	26,800	26,800
Poland	37,300	50,700	58,200
Albania	N.A.	N.A.	1,000
Bulgaria	N.A.	N.A.	7,200
Rumania	N.A.	40,000	48,000
Total Soviet Bloc Production	<u>616,400</u>	<u>756,200</u>	<u>817,100</u>
Western European Production Delivered to Soviet Bloc	154,500	159,900	207,500
Total Bloc Acquisition	<u>770,900</u>	<u>916,100</u>	<u>1,024,600</u>
Western European Production for Bloc as percent of Total Bloc Acquisition	20.0	17.5	20.3

Of interest in this breakdown is the decided drop in non-self-propelled vessels from over 94,000 GRT in 1953 to 57,000 GRT in 1955, a drop from about 60 percent of the total tonnage in 1953 to less than 30 percent in 1955. The construction of dry cargo vessels increased from 15 vessels of 27,000 GRT in 1953 to 40 vessels of over 98,000 GRT in 1955 and of fishing craft from 31 vessels totaling 12,000 GRT in 1953 to 46 vessels totaling 27,000 GRT in 1955. This indicates an increased interest by the Bloc in these two types of vessels.

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Table 5

Types of Soviet Bloc Vessels Constructed
in Western European Shipyards 7/

<u>Type of Vessel</u>	<u>1953</u>		<u>1954</u>		<u>1955</u>	
	<u>Number</u>	<u>GRT</u>	<u>Number</u>	<u>GRT</u>	<u>Number</u>	<u>GRT</u>
Tankers	6	14,452	7	10,705	7	10,705
Fishing Vessels	31	12,091	34	20,920	46	27,320
Dry Cargo	15	27,016	21	40,648	40	98,065
Dredgers	1	1,055	1	1,055		0
Tugs	14	5,612	19	6,082	23	6,245
Icebreakers		0	1	4,000	2	8,000
Non-Self-Propelled		94,320		76,516		57,196
Total		<u>154,546</u>		<u>159,926</u>		<u>207,531</u>

The construction of dry cargo vessels in 1952 and 1953 in the Soviet Bloc (Table 6)* amounted to approximately 40,000 GRT per year. Thus the tonnage of new dry cargo vessels constructed by Western Europe for the Bloc amounted to approximately 40 percent of the total dry cargo tonnage built and acquired by the Bloc in 1953 and by 1955 probably will be over 50 percent of the total tonnage built and acquired by the Bloc.

The construction of fishing vessels in 1952 and 1953 in the Soviet Bloc (Table 7)** amounted to approximately 65,000 GRT per year. The tonnage of new fishing vessels constructed by Western Europe for the Bloc was approximately 15 percent of the total fishing fleet vessels built and acquired by the Bloc in 1953. By 1955 this percentage will be doubled.

* Table 6 follows on p. 9.

** Table 7 follows on p. 9.

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Table 6

Tonnage of Ocean-Going Dry Cargo Vessels Constructed
in the Soviet Bloc
1952-53

Country	GRT	
	1952	1953
USSR <u>8/</u>	9,990	10,060
East Germany <u>9/</u>	5,965	N.A.
Czechoslovakia <u>10/</u>	0	0
Poland <u>11/</u>	24,127	27,777
Other Satellites	N.A.	N.A.
Minimum Construction Total	<u>40,082</u>	<u>37,837</u>

Table 7

Tonnage of Fishing Vessels Constructed
in the Soviet Bloc
1952-53

Country	GRT	
	1952	1953
USSR <u>12/</u>	16,300	17,040
East Germany <u>13/</u>	44,160	45,000 (Estimated)
Czechoslovakia <u>14/</u>	0	0
Poland <u>15/</u>	3,353	5,246
Other Satellites	N.A.	N.A.
Minimum Construction Total	<u>63,813</u>	<u>67,286</u>

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An indication of the importance the Russians attach to the acquisition of fishing vessels is seen in the fact that they are exchanging, among other things, manganese and chromium ores and pitchblende (uranium ore) for the fish factory vessels recently ordered in West Germany. 16/

4. Labor Inputs.

In judging the relief that Soviet Bloc shipyards receive from Western European shipbuilding for the Bloc, manpower inputs form a far better gauge than does GRT. For that reason, shipyard labor, both direct and indirect, required for Bloc ship construction in Western Europe has been computed and tabulated in Table 8.* The man-years of shipyard labor used in this construction increased from under 13,000 in 1950 to 15,500 in 1953 and reaches nearly 24,000 in 1955. The man-years of shipyard labor in the Bloc engaged in new construction of all types amounts to approximately 326,000 (Table 9).** Thus shipbuilding during 1950-55 in Western Europe for the Bloc involves a labor input equal to from 4 percent to 7 percent of the total new construction labor force available for all shipbuilding in the Bloc (1952-53).

Practically all Soviet Bloc shipyards capable of building ocean-going vessels are now engaged in the construction of naval vessels. An embargo of Western European building for the Bloc might have resulted in the curtailment of naval building of minor combatant and auxiliary types in the Bloc. An indication of this is seen in the recent displacement of cruiser construction in Soviet shipyards to provide way space for tanker construction. 17/

Another indication is seen in the comment of one of the members of the Soviet Trade Delegation to Western Germany that the reason the USSR had been so anxious to place the contract for fish factory vessels in Western Germany was that the only Soviet shipyard capable of doing this work was located at Leningrad and that the Leningrad Yard had at present such a backlog of orders for the Soviet Navy that it would not have been able to deliver the vessels before 1957. 18/

* Table 8 follows on p. 11.

** Table 9 follows on p. 11.

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Table 8

Shipyard Labor Used in the Construction
of Soviet Bloc Vessels
in Western European Shipyards 19/

Country	Man-years					
	1950	1951	1952	1953	1954	1955
Belgium	785	1,200	485	945	2,090	3,088
Denmark	300	1,041	1,685	1,065	800	415
Finland	9,000	9,700	10,930	10,790	10,065	9,160
France	0	0	0	200	1,500	1,795
West Germany	0	0	0	0	3,000	3,000
UK	300	0	0	0	1,150	3,450
Italy	1,020	950	630	450	1,850	1,506
Netherlands	50	288	650	1,333	801	200
Sweden	1,294	2,988	2,252	707	896	1,272
Total	<u>12,749</u>	<u>16,167</u>	<u>16,632</u>	<u>15,490</u>	<u>22,152</u>	<u>23,886</u>

Table 9

Total Shipyard Labor in the Soviet Bloc
Engaged in New Construction

		Man-years
USSR <u>20/</u>		
1952	Merchant Ship Construction <u>a/</u>	72,860
1952	Naval Vessel Construction	137,190
Total		<u>210,050</u>
Satellites <u>21/</u>		
1953	Construction	115,950
Total		<u>326,000</u>
<u>a. Mostly inland and coastal vessels.</u>		

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A measure of the displacement which might have resulted from a complete embargo of vessels to the Soviet Bloc can be gained from comparing the Western European man-years of shipyard labor used for the Bloc construction (15,500 in 1953) with the estimated man-years used to construct various types of naval vessels in the USSR (see Table 10).

Table 10

Estimated Man-years Required to Build Soviet Naval Vessels 22/

	<u>Standard Displacement (GRT)</u>	<u>Man-years</u>
Destroyer	3,000	1,390
Submarine (Ocean Patrol)	1,500	835
Submarine (Medium Range)	600	335
Submarine (Coastal)	400	220
Mine Sweepers	600	280

It may be seen that had the Bloc been forced to obtain the vessels furnished by Western Europe from Bloc shipyards, 10 to 50 minor combatant naval craft might have been displaced annually.

5. Steel Inputs.

Invoiced steel inputs for Soviet Bloc vessels built in Western European yards are tabulated in Table 11.* The steel used dropped from over 50,000 metric tons in 1950 and 1951 to 20,000 tons in 1953 because the USSR provided the steel required for ships built in Finland. 23/ These values are insignificant, however, in comparison with a total Bloc crude steel production in 1953 of 48 million metric tons. 24/

There are indications that the Soviet Bloc is willing to provide steel for Western European shipbuilding. As noted above, the USSR is providing all steel required for ships built under the

* Table 11 follows on p. 13.

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Table 11

Invoiced Hull Steel Used in the Construction
of Soviet Bloc Vessels in Western European Shipyards 27/

Country	Metric Tons					
	1950	1951	1952	1953	1954	1955
Belgium	7,080	4,170	1,000	8,735	9,240	4,793
Denmark	960	5,786	6,749	963	2,889	963
Finland	40,000 <u>a/</u>	33,500	24,200 <u>b/</u>	2,660 <u>b/</u>	0	0
France	0	0	0	0	6,375	6,375
West Germany	0	0	0	0	9,130	9,130
UK	960	0	0	0	1,325	3,975
Italy	1,600	380	400	2,668	5,541	926
Netherlands	570	3,140	4,070	5,020	1,500	250
Sweden	3,525	6,390	4,485	0	1,875	2,750
Total	<u>54,695</u>	<u>53,366</u>	<u>40,904</u>	<u>20,046</u>	<u>37,875</u>	<u>29,162</u>

a. Estimated.

b. The USSR has provided all steel for vessels built in Finland under trade agreements.

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trade agreements in Finland and also offered to provide Denmark with steel for the construction of tankers and refrigerated cargo vessels. 25/ Denmark finally obtained this steel from Western sources because the USSR objected to mill inspection of the steel by Danish inspectors. 26/

6. Main Propulsion Machinery.

The main propulsion units obtained from non-Soviet Bloc sources and installed in Bloc vessels built in Western Europe have been tabulated in Table 12.* Both steam and diesel units installed are comparatively small, averaging 890 horsepower (HP) per plant for the steam plants, with a range of from 150 HP to 10,500 HP. Diesel units average 873 HP per plant, with a range of from 200 HP to 6,900 HP. Available figures on main propulsion machinery built in the Bloc, summarized in Table 13,** indicate that the average annual diesel machinery HP installed in Bloc vessels in Western Europe from 1950 to 1955 amounts to approximately 8 percent of the marine diesel machinery produced in the European Satellites in 1953 and is thus only a small contribution to the diesel production of the Bloc. Production in the USSR is estimated to equal at least Satellite production. The average annual installations of steam plants in Bloc vessels in Western Europe amount to less than 2 percent of the HP of marine steam turbines produced in the USSR during 1951.

III. Ship Repairs in Western Europe for the Soviet Bloc.

1. General.

An increasing number of Soviet Bloc vessels have put in to Western European yards for repair in recent years. Repairs are usually extensive and the length of overhaul often extends over 6 to 8 months. Shipyard labor rather than material inputs is the principal input going into these repairs. Material inputs are negligible.

* Table 12 follows on p. 15.

** Table 13 follows on p. 16.

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Table 12

Main Propulsion Machinery Used in Soviet Bloc Vessels Built
in Western European Shipyards 28/

	1950		1951		1952		1953		1954		1955							
	Type	Units	Horse-power	Type	Units	Horse-power	Type	Units	Horse-power	Type	Units	Horse-power						
Belgium	Diesel	6	8,340	Diesel	6	7,720	Diesel	2	3,400	Diesel	6	8,340	Diesel	9	15,000	Diesel	8	20,060
Denmark	Diesel	1	4,200	Diesel	3	9,500	Diesel	7	5,100	Diesel	5	8,100	Diesel	3	3,900	Diesel	2	2,600
Finland	N.A.	N.A.	N.A.	Steam	38	20,800	Steam	31	17,500	Steam	20	12,000	Steam	21	24,900	Steam	21	34,800
	N.A.	N.A.	N.A.	Diesel	26	5,850	Diesel	29	11,435	Diesel	25	17,575	Diesel	27	19,075	Diesel	25	12,675
France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UK	Steam	1	2,000	0	0	0	0	0	0	0	0	0	Diesel	5	10,000	Diesel	5	10,000
Italy	Diesel	5	5,100	Diesel	4	3,500	Diesel	8	2,000	0	0	0	Diesel	5	4,825	Diesel	15	14,475
	Steam	8	1,200	Steam	8	1,200	0	0	0	0	0	0	Steam	3	9,000	0	0	0
Netherlands	0	0	0	Steam	4	3,200	Steam	4	3,200	Steam	2	1,600	0	0	0	0	0	0
	0	0	0	0	0	0	Diesel	1	7,000	Diesel	3	11,800	Diesel	4	14,200	0	0	0
Sweden	Steam	8	7,900	Steam	19	13,850	Steam	16	11,600	0	0	0	Steam	6	4,800	Steam	8	6,400
	Diesel	14	5,290	Diesel	20	7,340	Diesel	16	6,380	Diesel	3	1,330	Diesel	1	850	0	0	0
Totals																		
Steam		<u>17</u>	<u>11,100</u> a/		<u>69</u>	<u>39,050</u>		<u>51</u>	<u>32,300</u>		<u>22</u>	<u>13,600</u>		<u>32</u>	<u>47,700</u>		<u>32</u>	<u>54,700</u>
Diesel		<u>26</u>	<u>22,930</u> a/		<u>59</u>	<u>33,910</u>		<u>63</u>	<u>35,315</u>		<u>42</u>	<u>47,145</u>		<u>62</u>	<u>74,100</u>		<u>65</u>	<u>63,310</u>

a. Minimum total.

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Table 13

Marine Engine Building in the Soviet Bloc
1953

	Horsepower		
	Diesels Under 750	Diesels Over 750	Steam Propulsion Plants
USSR <u>29/</u>	N.A.	N.A.	1,900,000 (1951 Steam Turbines Only)
<u>Satellites 30/</u>			
Albania	0	0	0
Bulgaria	0	0	0
Czechoslovakia	144,000 <u>a/</u>	6,000 <u>b/</u>	N.A.
East Germany	94,000	6,000	N.A.
Hungary	302,800	19,200	N.A.
Poland	N.A.	10,300	N.A.
Rumania	0	0	N.A.
Total	At least <u>540,800</u>	At least <u>41,500</u>	At least <u>1,900,000</u>

a. 480 units estimated to average 300 horsepower.

b. 6 units estimated to average 1,000 horsepower.

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One feature in connection with the lengthy stay of these Soviet Bloc vessels which cannot be discounted is the fact that they frequently enter yards which are near concentrations of NATO vessels for possible espionage purposes. 31/

2. Labor Inputs.

An analysis of the ship repair industry from which the total Soviet Bloc repairs can be separated is available only from Belgium. Extracts from this analysis are listed in Table 14*, and indicate that during 1950-52 average Bloc repairs far exceed in cost the average of repairs for non-Bloc vessels (\$39,000 for Bloc vessels compared to \$7,500 for all vessels repaired).

A further breakdown of these Belgian repair costs for the Soviet Bloc, (Table 15**) indicates that the average repair costs of Soviet vessels is \$118,000 compared to only \$14,000 for Satellite vessels. The high cost of USSR vessel repair implies major reconditioning of the vessels rather than an annual overhaul.

In other Western European countries doing repair work for the Soviet Bloc, the usual information available lists only the name of the vessel, the GRT, and the length of overhaul. To use this, labor inputs have been estimated by developing a cost per GRT per day factor from which the estimates of shipyard labor used in the repair of Bloc vessels have been derived. A summary of these labor inputs is shown in Table 16.***

The repair of Soviet Bloc vessels in Western European shipyards utilizes only a very small percent (slightly over 1 percent in 1952 and less than 1 percent in 1951 and 1953) of the 400,000 shipyard workers in Western Europe. 32/ Thus the impact of this repair on Western European yards is negligible. So far as the Bloc is concerned these repairs add materially to the relief afforded Bloc shipyards by the construction of Bloc vessels.**** The total labor force in the USSR in 1952 engaged in ship repair work was 102,000 with the majority of workers engaged in the repair of inland and coastal vessels. 33/

* Table 14 follows on p. 18.

** Table 15 follows on p. 19.

*** Table 16 follows on p. 19.

**** See Section II, 3, above.

Table 14

Statistics on the Ship Repair Industry of Belgium 34/

<u>Industry Wide</u>	<u>Unit</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
Total Repair Workers		4,417	6,929	5,725
Total Wages	Dollars	5,611,760	10,571,320	11,313,660
Total Hours Worked	Thousands	8,896	16,000	14,008
Average Wage per Hour	Dollars	.631	.660	.808
Cost of Repairs - All Vessels	Dollars	17,093,580	29,110,000	34,464,000
<u>3 Major Yards</u>				
Total Number Vessels Repaired		2,149	1,601 (2 yards only)	2,623
Total Cost of Repairs	Dollars	8,593,587	19,011,940 (13,243,980 - 2 yards only)	26,240,338
Percent of Industry	Percent	50	65	76
Bloc Vessels Repaired		37	38	34
Cost of Repairs - Bloc Vessels	Dollars	1,029,177	2,241,045	957,558
Average Cost Repair per Vessel	Dollars	4,000	8,270	10,000
Average Cost Repair per Bloc Vessel	Dollars	27,800	59,000	28,200
Worker-hours Bloc Repair	Hours	810,000	1,700,000	590,000
Man-years Bloc Repair	Man-years	400	735	242

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Table 15

Ship Repairs for the Soviet Bloc in Belgium 35/

<u>Year</u>	<u>Soviet Vessels</u>		<u>Satellite Vessels</u>	
	<u>Number</u>	<u>Costs (Dollars)</u>	<u>Number</u>	<u>Costs (Dollars)</u>
1950	10	885,514	27	143,663
1951	10	1,600,891	28	640,154
1952	6	579,741	28	377,817
Total	<u>26</u>	<u>3,066,146</u>	<u>83</u>	<u>1,161,634</u>
Average Cost per Vessel		118,000		14,000

Table 16

Shipyard Labor Expended on Repairs of Soviet Bloc Vessels
in Western European Shipyards 36/

<u>Country</u>	<u>Man-years</u>			
	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>
Belgium	400	735	242	615
Denmark	N.A.	103	336	188
France	N.A.	N.A.	458	N.A.
UK	N.A.	210	404	303
Italy	N.A.	1,559	2,308	739
Netherlands	N.A.	454	687	423
Minimum Total	<u>400</u>	<u>3,061</u>	<u>4,435</u>	<u>2,268</u>

Repairs in Western European yards for the Bloc amounted to approximately 4 percent of the total Soviet repair load in 1952.

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If shipyard work is required in Western Europe to relieve unemployment, it might seem more attractive to the West to repair Soviet Bloc vessels rather than build new vessels for the Bloc since ship repair labor costs usually amount to 50 to 70 percent of the total cost, whereas new construction labor costs are only 35 percent of the total. This comparison relates only to labor in shipyards. Also, repairs of Bloc vessels do not add to the size or reduce the average age of the Bloc fleets.

IV. Conclusions.

1. Western European shipbuilding for the Soviet Bloc adds materially to the tonnage of new construction vessels of all types built and acquired by the Bloc, amounting to approximately 20 percent of the estimated total merchant tonnage acquired in the years 1953, 1954, and 1955. In 1953 the Bloc dry cargo vessels constructed in Western Europe amounted to approximately 40 percent of the tonnage of dry cargo vessels constructed in the Bloc, and by 1955 will probably exceed 50 percent. The Bloc construction in Western Europe has increased the number of vessels added to the Bloc fishing fleet by approximately 15 percent of the tonnage added to the fleet in 1953. By 1955 this percentage will probably double.

2. The relief afforded Soviet Bloc shipyards by shipbuilding in Western Europe as measured in man-years of shipyard labor amounts to from 4 percent (1950) to 7 percent (1955) of the total Bloc shipyard labor engaged in new construction in 1952-53. Had Bloc shipyards been forced to construct vessels built in Western Europe, 10 to 50 vessels in the Bloc naval construction program of minor combatant types (destroyers, submarines, and minesweepers) might have been displaced.

3. The main propulsion machinery obtained from non-Soviet Bloc sources and installed in Bloc vessels built in Western Europe did not augment Bloc production to any great extent. The hull steel inputs in these vessels were insignificant compared to total Bloc steel production.

4. Labor expended on repairs of ocean-going Soviet Bloc vessels in Western Europe in 1952 amounted to about 4 percent of the Soviet shipyard manpower engaged in repairs to vessels of all types -- inland, coastal, and ocean-going. This added materially to the relief afforded Bloc shipyards by the building of Bloc vessels in Western Europe.

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APPENDIX A

METHODOLOGY

I. Shipbuilding Costs and Labor Inputs.

1. Details of shipbuilding costs, from which labor inputs can be obtained, are most jealously guarded by shipbuilders and are not readily available. Such cost data as are released are often misleading since there is no standardization of accounting precedures among the various shipyards.

Table 17* lists data found on costs in Western European yards. From these data it appears that 35 percent of the total shipbuilding cost is spent for direct and indirect labor. A percentage of 35 percent has therefore been used in this report to break down total costs and obtain man-hours of direct and indirect labor (dividing the labor cost by the average wage).

2. Average wages used in this report in computing man-years of shipyard labor in the several countries are shown in Table 18.**

3. In those cases where no costs are available, man-year estimates were computed from estimated values of GRT per man-year for the several countries. 37/

II. Ship Repair Costs and Labor Inputs.

1. In order to estimate repair costs of Soviet Bloc vessels in Western European yards where only the GRT of the vessel and the length of stay in port are known, an average value of cost per GRT per day was developed which though undoubtedly unreliable in individual cases is believed to be accurate in estimating a number of overhauls.

2. In only one country, Belgium, was there a fairly complete analysis available of the ship repair industry. Tables 14 and 15*** have been extracted from this analysis for the years 1950, 1951, and 1952. It may be noted from Table 15 that the cost of repair of Bloc

* Table 17 follows on p. 22.

** Table 18 follows on p. 23.

*** P. 18-19, above.

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Table 17

Breakdown of Western European Shipbuilding Costs

<u>Country</u>	<u>Type</u>	<u>Tonnage</u>	<u>Direct and Indirect Labor (Percent)</u>
West Germany <u>38/</u>	Motor Cargo	175 LSD <u>a/</u>	38
	Motor Cargo	274 LSD	43
	Motor Trawler	500 LSD	33
	Steam Trawler	620 LSD	42
	Motor Cargo	1,294 LSD	31
	Motor Tanker	1,200 LSD	35
	Motor Trawler	615 LSD	31
	Motor Cargo	1,770 LSD	33
	Motor Cargo	1,208 LSD	31
	Motor Cargo	1,102 LSD	29
		Average	34.6
Denmark <u>39/</u>	Motor Cargo	6,700 GRT <u>b/</u>	33
Netherlands <u>40/</u>	Turbine Tanker	31,000 DWT <u>c/</u>	36
West Germany	Turbine Tanker	35,550 DWT	37
Netherlands <u>41/</u>	Motor Cargo	6,165 GRT	40
	Motor Tanker	12,054 GRT	35
UK	Small Cargo <u>42/</u> (Production in one plant) <u>43/</u>		30

a. LSD - Light ship displacement is the weight of the ship complete, in tons of 2,240 pounds, ready for service in every respect but without crew and their effects or any items of consumable or variable load.

b. GRT - Gross registered tonnage is the total volume within the enclosed portion of the ship including deck houses (with certain minor exceptions), expressed in units of 100 cubic feet to a ton.

c. DWT - Deadweight tonnage is the difference in tons of 2,240 pounds, between the full load displacement and the light displacement of a ship. This represents the carrying capacity of the vessel.

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Table 18

Average Wage in the Shipbuilding Industry in Western Europe
1952

		Dollars per Hour	
Country	Reported for 1952 <u>44/</u>	Other	Wage Used in Report
Belgium	0.58		0.58
Denmark	0.64	0.45 <u>45/</u>	0.45
France	0.41	<u>Metal Trades - 1952</u>	1951-52 0.40 1955 0.45
		Unskilled 0.327) Semiskilled 0.398) Average 0.394 Skilled 0.457)	
Germany	0.407	1951 - 0.415 <u>46/</u> 1953 - 0.43	1955 0.45
UK	0.54	<u>Average Shipbuilding and Repair 47/</u>	1950-52 0.524
		1952 0.516) Average 0.524 1953 0.532)	1953 0.565 1954-55 0.60
		April 1952 0.535) After November 1952 0.565) <u>48/</u>	
Italy	0.34	<u>Engineering Trades - 1952 49/</u>	1950-52 0.264
		Highly Skilled 0.17 to 0.284) Skilled 0.159 to 0.271) Average 0.208 Special Laborers 0.155 to 0.245) Other 0.150 to 0.232)	
Netherlands	0.37	<u>All Metal Trades 50/</u>	1951-53 0.36
		1952 0.36 1953 0.368	
Sweden	0.93	<u>All Shipyard Workers 51/</u>	1950-53 0.565
		0.80 1951 0.565 <u>52/</u>	

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vessels averages \$39,000 per vessel over the 3 years compared to an average cost per vessel of all vessels repaired of \$7,500. A further breakdown of the data indicates that the repair costs of Soviet vessels as a class are particularly high averaging \$118,000 per vessel over the 3-year period compared to \$14,000 per vessel for the Satellites. The cost per ton per day of all Soviet vessels, assuming an average overhaul of 2 months and an average GRT of 5,500 (the average of all Bloc vessels individually reported in 1952 and 1953), is \$0.413. There are only two Belgian repair costs available on individual Bloc vessels. These indicated an average cost per GRT per day of \$0.43. 53/

3. In Italy, repair costs were reported on 14 Bloc vessels on which there are definite dates of arrival and departure, Table 19.* These costs average \$0.425 per GRT per day.

4. In the Netherlands, repair costs were reported for one vessel, the SS Pskov, 7,176 GRT. The cost was \$238,000 for an overhaul of 78 working days or \$0.425 per GRT per day. 54/

5. In Great Britain, one report 55/ indicated a repair cost in excess of 100,000 pounds. Based on the rate derived from Italian data (\$0.425 per GRT per day) the costs are \$406,000 or 145,000 pounds.

6. In view of the Italian data and confirmation in other countries the rate of \$0.425 per GRT per day has been used in this report in computing overhaul costs. This compares with US values 56/:

<u>Type of Vessel</u>	<u>Length of Overhaul</u>		<u>Cost per GRT per Day</u> (Dollars)
	<u>Annually</u> (Days)		
Cargo	18		0.77
Transport	20 + (2 x 7) = 34		0.535
Small Tanker	18		1.42

It also compares with values from a British shipping company which reported annual repair costs as \$5.60 per GRT. 57/ Based on an 18-day overhaul period this amounts to \$0.31 per GRT per day.

* Table 19 follows on p. 25.

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Table 19

Soviet Bloc Ship Repair Costs in Italy 58/

<u>Name of Ship</u>	<u>Repair Cost (Million Lira)</u>	<u>Length of Stay (Months)</u>	<u>GRT</u>
Parnis	850	10	6,492
Karaganda	66	2	5,627
Maxim Gorki	224	6	1,021
Timiresliev	44.5	2	6,094
Ismail	70	2	5,670
Belorussiya	46.5	3	6,040
Lermartov	70	2	6,077
Vostok	56	3½	5,763
Krasnodar	60	5	4,168
Kolchoznik	41.5	1½	7,148
Gen. Chemakovsky	75	3½	6,121
Stalinabad	62	1½	7,176
Andrew Suvarov	140	3½	7,176
Bulgaria	51	2½	4,191
Total	<u>1,856.5</u>	<u>48</u>	<u>78,764</u>

Average Cost = 132.6 million lira
\$212,200

Average Time = $\frac{48 \times 26}{14} = 89$ days

Average GRT = $\frac{78,764}{14} = 5,626$

Cost per GRT
per Day = $\frac{\$212,200}{89 \times 5,626} = \$0.424 = 265$ lira

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7. The percentage of total repair cost used for wages is estimated to be 50-70 percent depending upon the length of overhaul. In this report the following percentages have been used:

<u>Length of Overhaul (Days)</u>	<u>Labor Costs as a Percentage of Total Cost</u>
Up to 26	70
26 to 52	60
52 to 78	50

8. It is interesting to compare the above values with Soviet percentages:

<u>Work</u>	<u>Labor Costs as a Percentage of Total Cost</u>	
	<u>Western Europe (Percent)</u>	<u>USSR ^{59/} (Percent)</u>
New Construction	35	12
Repair		
Capital Repair	50 ^{a/}	18 ^{b/}
Medium Repair	to	24
Current Repair	70	32

a. Repair costs are 1.4 to 2 times new construction percentage.

b. Repair costs are 1.5 to 2.7 times new construction percentage.

These figures indicate that the labor cost percentages assumed for Western Europe and those reported for the USSR bear relatively the same relation to the new construction labor cost percentage.

III. Steel Inputs.

The net steel in the hull is derived from the displacement (light ship), the deadweight tonnage, or the GRT using the average percentages shown in Table 20.* Ten percent is added in each case

* Table 20 follows on p.27.

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for wastage to obtain "invoiced" steel. In the case of dredgers and hopper barges, steel weights have been computed from tables in Kari. 60/

Table 20

Comparison of Net Steel in the Hull as a Percent of Light Ship Displacement, a/ Deadweight Tonnage, b/ or GRT 61/

<u>Type of Vessel</u>	<u>Percent of Light Ship Displacement</u>	<u>Percent of Deadweight Tonnage</u>	<u>Percent of GRT</u>
Small Tanker	66	26	40
Small Motor Cargo Vessel			
Shelter Deck	62	31	52
Full Scantling	62	31	36
Trawler	47	49	51
Small Tug	36		
Non-Self-Propelled Vessel	90		

- a. The light ship displacement is the weight of the ship complete, in tons of 2,240 pounds, ready for service in every respect but without crew and their effects or any items of consumable or variable load.
- b. The deadweight tonnage is the difference in tons of 2,240 pounds, between the full load displacement and the light displacement of a ship. This represents the carrying capacity of the vessel.

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APPENDIX B

GAPS IN INTELLIGENCE

The principal gap is in information on the construction of non-self-propelled vessels in all countries other than Finland. There are indications that this construction amounts to considerable tonnage annually but no detailed information is available.

Secondary gaps exist in detailed information regarding construction costs and also repair costs.

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APPENDIX C

SOURCES AND EVALUATION OF SOURCES

1. Evaluation of Sources.

The principal sources of information for this report were as follows:

- a. State Department reports.
- b. Naval Attache reports.
- c. Maritime Attache reports.
- d. Trade journals and newspapers.

All these sources provided information which was evaluated as probably true. The facilities of the CIA Library were used to the fullest extent, and numerous documents on East-West trade and Western European shipbuilding were examined. The detailed computations from which tables of GRT, labor, steel, and main propulsion machinery inputs were compiled are on file in ORR.

2. Sources.

Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
A - Completely reliable	Doc. - Documentary
B - Usually reliable	1 - Confirmed by other sources
C - Fairly reliable	2 - Probably true
D - Not usually reliable	3 - Possibly true
E - Not reliable	4 - Doubtful
F - Cannot be judged	5 - Probably false
	6 - Cannot be judged

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which will carry the field evaluation "Documentary" instead of a numerical grade.

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Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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