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INTELLIGENCE MEMORANDUM

CONSTRUCTION AND IMPORTS OF FISH FACTORY TRAWLERS  
FOR THE SOVIET FISHING FLEET  
1955-67

CIA/RR IM 59-6

13 May 1959

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CONSTRUCTION AND IMPORTS OF FISH FACTORY TRAWLERS  
FOR THE SOVIET FISHING FLEET\*  
1955-67

Summary

The USSR has embarked on a program to add during 1955-67 about 175 fish factory trawlers to its fishing fleet -- a program of a scope and magnitude unmatched by any other country in the world. The only known fish factory trawlers in countries outside the Sino-Soviet Bloc are the UK trawlers: the Fairtry, currently in operation, and two others under construction. This type of trawler is designed to combine fishing with the processing of the fish catch in one vessel, thereby reducing the amount of loss from spoilage and generally improving the quality of the fish products.

The total tonnage of this class of vessel planned by the USSR for import and construction by 1965 is estimated at 475,000 gross register tons (GRT)\*\* and the total program may exceed 539,000 GRT by 1967. It would cost about 3.1 billion rubles\*\*\* to construct the entire Soviet fleet of 175 trawlers in the USSR or more than \$560 million to construct these vessels in the US.\*\*\*\* This tonnage for one type

\* The estimates and conclusions in this memorandum represent the best judgment of this Office as of 1 April 1959.

\*\* Gross register tonnage is a measure whereby the entire internal cubic capacity of a vessel is expressed in register tons -- 100 cubic feet per ton. Not included in the measurement are certain spaces such as peak tanks and other tanks of water ballast, open forecastle, bridge and poop, hatchway excess, certain light and air spaces, anchor gear, steering gear, wheelhouse, galley, cabins for passengers, and other minor spaces specified by law.

\*\*\* Unless otherwise indicated, ruble values throughout this memorandum are given in 1955 rubles and dollar values in 1955 US dollars.

\*\*\*\* The prices paid to shipyards outside the USSR are based on prices approximating the world market and are believed to be less than Soviet costs of internal construction.

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of vessel is a highly significant addition in comparison with the estimated total of 775,000 GRT for the entire Soviet high seas fishing fleet at the end of 1955. These trawlers will increase substantially the fish products reaching the Soviet market from the high seas fleet, thus contributing to the planned increase in proteins and to a greater variety in the diet available to the Soviet consumer.

During 1955-57, 24 fish factory trawlers were obtained from West Germany, and both Poland and the USSR are engaged in constructing similar vessels. Poland is scheduled to construct about 30 trawlers and the USSR about 36. East Germany is scheduled to build a series of fish factory trawlers for the USSR beginning in 1961, with deliveries extending through 1967.

#### I. Introduction.

The USSR has embarked on an extensive program for construction and imports of fish factory trawlers during 1955-67. The objective of this program is to provide the USSR with trawlers capable of combining fishing with the processing of the fish catch in one vessel, thereby reducing the amount of loss from spoilage and generally improving the quality of fish products. Substantial increases in the fish products reaching the Soviet market from the high seas fishing fleet will contribute to the planned increase in proteins available to the Soviet consumer and also will add greater variety to his diet.

Although much consideration has been given by countries engaged in high seas fishing to proposed methods for preserving the quality of the catch, few improvements actually have been made. Better insulation of cargo holds, better refrigeration, and increased speed of vessels are a few of the improvements proposed. Some of these improvements, however, have added to the cost of operations.

Because of poor fishing and the great distance from the mainland, fishing vessels equipped with insulated holds and using crushed ice

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for chilling and preserving the catch and vessels equipped to freeze mechanically part of the catch often are forced to return to home port with only a partial load.

To permit fishing vessels to remain on the fishing grounds until a full load is caught and at the same time to preserve the quality of the catch, the UK developed a fish factory trawler designed to preserve the entire catch either by mechanical freezing or by canning. The first experimental UK vessel was a conversion. Because of the success of this experiment, a specially designed fish factory trawler, the Fairtry, was constructed and completed in early 1954.

The fishing industry of the USSR recognized the value of such a vessel to its own fishing enterprise, particularly for the region where the fishing grounds are a great distance from the homeland, and immediately began an extensive program for construction and imports of fish factory trawlers.

The UK fish factory trawler Fairtry and two other fish factory trawlers under construction in early 1959 for the owners of the Fairtry are the only known fish factory trawlers in countries outside the Sino-Soviet Bloc.

## II. Soviet Program.

A Soviet press notice of 7 February 1959 states that by the end of the Soviet Seven Year Plan (1959-65) the fleet of fish factory trawlers will number about 155 trawlers. The extent of this program is not known. Reports, however, indicate that the program will be carried on past 1965 and that a minimum of 20 additional trawlers will be added after 1965.

In 1954 and 1955 the Soviet government contracted with the Kieler Howaldtswerke Aktiengesellschaft shipyard at Kiel in West Germany to construct 25\*\* fish factory trawlers. These fish factory trawlers were, in design, almost identical to the UK fish factory trawler Fairtry, which was completed in the first half of 1954.

\*\* Only 24 vessels actually were constructed.

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The West German contract was completed by the end of 1957. Although the reported prices of these vessels vary somewhat, it is believed that the average price per trawler to the USSR was about US \$1.8 million.

Information available at this time indicates that Polish, East German, and Soviet shipbuilding will make up the difference between the 24 trawlers obtained from West Germany and the apparent goal of 175 trawlers.

During the early stages of the West German contract the Soviet government decided to undertake construction of fish factory trawlers in one of its own shipyards. This decision was evident in one of the shipbuilding exhibits at the All-Union Agricultural and Industrial Exposition held in Moscow in 1956. This exhibit was a model of the largest shipbuilding shop -- commonly referred to as Shop No. 32 by German ex-prisoners of war -- in Nikolayev Shipyard No. 144 imeni Nosenko. This model showed a fish factory trawler in the process of being moved out of the west end of Shop No. 32 and on a floating dry-dock for launching. It is noteworthy that at the time of this exhibit Shop No. 32 actually was engaged in construction of W-class submarines, and it is estimated that perhaps 13 submarines were constructed in this shop in 1956. Construction of a series of Mayakovskiy-class fish factory trawlers actually got under way in this shop in early 1957.

Poland announced in 1958 that it would construct more than 30 fish factory trawlers for the USSR, and the keel of the first fish factory trawler was laid in Poland in November 1958.

In July 1958 it was reported that a project had been initiated in East Germany, by the USSR, to construct a series of fish factory trawlers at the Volkswerft Stralsund Shipyard and that this program would begin in 1961. These trawlers were to be similar to those constructed by West Germany for the USSR. Alterations to the facilities in the Stralsund Shipyard would be required before construction of the trawlers could begin, and the reported estimated cost of the alterations was about 22.3 million Deutsche Mark East (DME). In February 1959 it was reported that the USSR had placed orders with the Stralsund Shipyard to construct a total of 85 fish factory trawlers to be delivered by 1967. Starting with 1964, 20 trawlers were to be delivered every year. Total cost of the contract was reported to amount to 1.5 billion DME, or 18 million DME per trawler. Other reports indicated that about 65 trawlers of this program were scheduled for delivery by the end of 1965.

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The size of the Soviet high seas fishing fleet at the end of 1955, including all classes and types of fishing vessels,\* was estimated at 775,000 GRT. At an average of 2,500 GRT per fish factory trawler constructed in West Germany and 3,170 GRT per trawler to be constructed in Poland, East Germany, and the USSR, a fleet of 155 trawlers by 1965 would amount to 479,000 GRT, and an estimated fleet of 175 trawlers by 1967 would amount to more than 539,000 GRT. These trawlers will constitute a highly significant addition to Soviet fishing capability.

### III. Comparison of Fish Factory Trawlers.

The following trawlers are designed to trawl over the stern and are equipped for the complete processing of the fish catch: the UK fish factory trawler Fairtry; the West German trawlers, referred to as the Pushkin class; and the Soviet version, referred to as the Mayakovskiy class. The processing of the fish includes gutting, washing, heading, filleting, skinning, weighing, packaging, and freezing. Fish meal is made of the waste products, and cod liver oil is extracted by a boiling plant. Most of the processing work is done by machinery. A comparison of the three types of trawler is shown in Figure 1.\*\*

The Mayakovskiy-class trawlers are reported to have a trip capacity of 600 tons of frozen fish products, 100,000 1-kilogram equivalent cans of canned fish, 14 metric tons of semifinished cod liver oil, and 166 metric tons of fish meal. The fish processing equipment has a capacity of 30 metric tons of fish products in 24 hours. The trawler is designed to operate without a mother ship for 80 days, including 60 days fishing and 20 days en route to and from fishing grounds.† On this basis, four trips per year are possible.

### IV. Nikolayev Shipyard No. 444 imeni Nosenko.

Soviet press notices since 1956 have publicized construction of fish factory trawlers at Nikolayev Shipyard No. 444 imeni Nosenko. Construction began in early 1957, and the first trawler was delivered in April 1958.

\* No fish factory trawlers were included in this estimate, although several had been delivered from West Germany.

\*\* Following p. 6. The Polish and East German vessels are believed to be comparable to the Mayakovskiy class.

The shop in which these trawlers are being constructed is composed of one long assembly hall, 1,280 ft by 125 ft, and two abutting wings, one composed of four bays and one of seven bays. The total square footage of the entire building is about 450,000 square feet. According to the Moscow exhibit the vessels will be constructed according to the positional method, and all work will be done in three positions, after which the vessel will be launched. This method, wherein a vessel is started at one position and moved by means of carriages on rails to other positions, is not unique to construction in this shipyard. It is used in many other Soviet shipyards and is becoming standard practice wherever conditions permit.

On the basis of Soviet press notices of launchings and deliveries of Soviet-constructed fish factory trawlers and of observations of these trawlers passing the Bosphorus strait (Black Sea exit), a tentative construction schedule has been established and is shown in Figure 2.\*

Eight trawlers were completed during 1958. It is estimated that 10 trawlers will be delivered during 1959 and that probably 36 trawlers will be constructed by Nikolayev Shipyard No. 444 by the end of 1961. Whether or not this program in the USSR will continue is not known, but it would appear that it is to end at about the time that the East German program gets under way.

#### V. Cost.

The fish factory trawlers purchased from West Germany cost the USSR about US \$1.8 million each. Because West German shipbuilding costs in 1955 were estimated to be 60 percent of US shipbuilding costs, construction of these trawlers would have cost about \$3.0 million in the US.

Prices of vessels in the world market also were estimated to be 60 to 65 percent of US prices of vessels. Because fish factory trawlers were a new type of vessel, no world market price was available for this type of vessel. The USSR paid a price consistent with average West German shipbuilding prices for vessels of similar complexity.

\* Following p. 6.

## Comparison of Selected UK, West German, and Soviet Fish Factory Trawlers

	FAIRTRY	PUSHKIN CLASS	MAYAKOVSKIY CLASS
LENGTH OVER-ALL	281 feet	277 feet	287 feet
LENGTH BETWEEN PERPENDICULARS	245 feet	246 feet	256 feet
BEAM	44 feet	44 feet	45 feet
DRAFT	23 feet	18 feet	18 feet
CAPACITY OF REFRIGERATED CARGO SPACE	600 metric tons	600 metric tons	600 metric tons
DEADWEIGHT TONNAGE	N.A.	1,242 tons	1,250 tons
GROSS REGISTER TONNAGE	2,605 tons*	2,500 tons*	3,170 tons**
FULL LOAD DISPLACEMENT	N.A.	3,477 tons	3,670 tons
PROPULSION MACHINERY AND HORSEPOWER	Diesel 1,900 horsepower	Diesel 1,900 horsepower	Diesel 2,000 horsepower
SPEED	N.A.	12.5 knots	13 knots (service)
CREW	90 (estimated)	105	116

\*Based on Lloyd's Register of Shipping measurements.

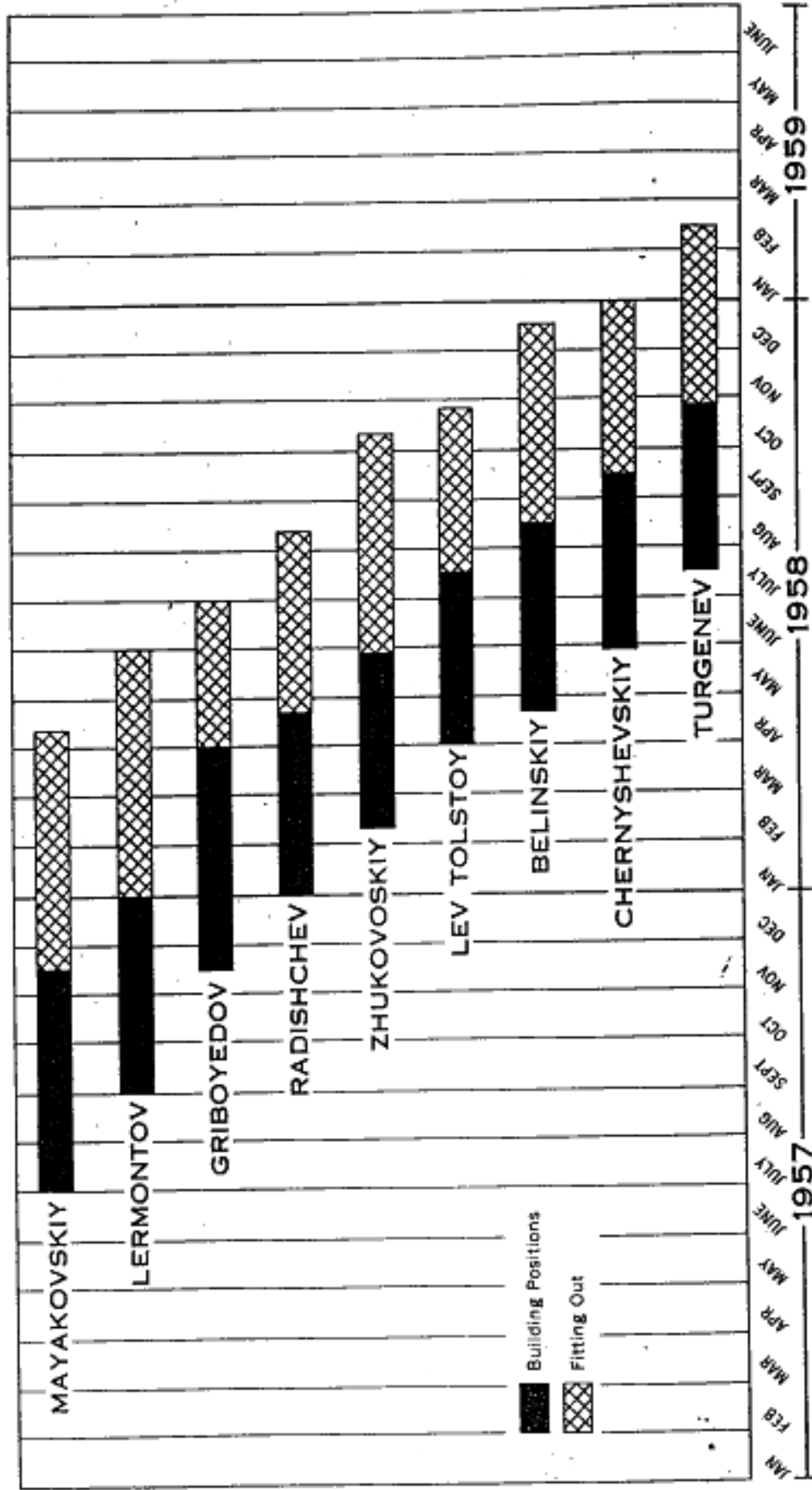
\*\*Based on USSR Register of Shipping measurements.

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Figure 2

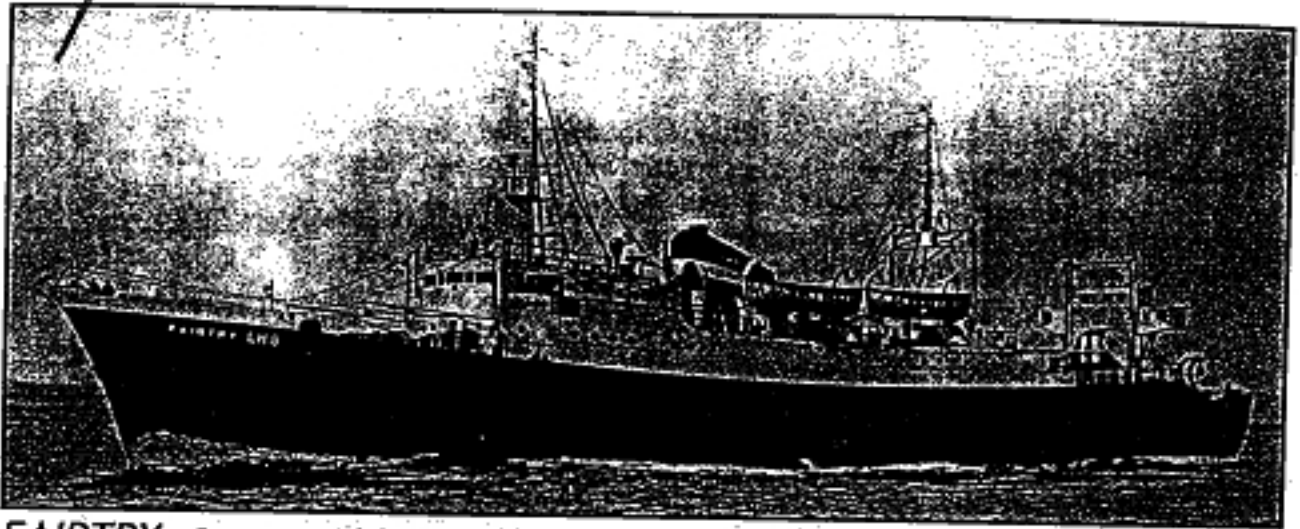
# USSR: Estimated Schedule of Construction of Fish Factory Trawlers at Nikolayev Shipyard No. 444\*



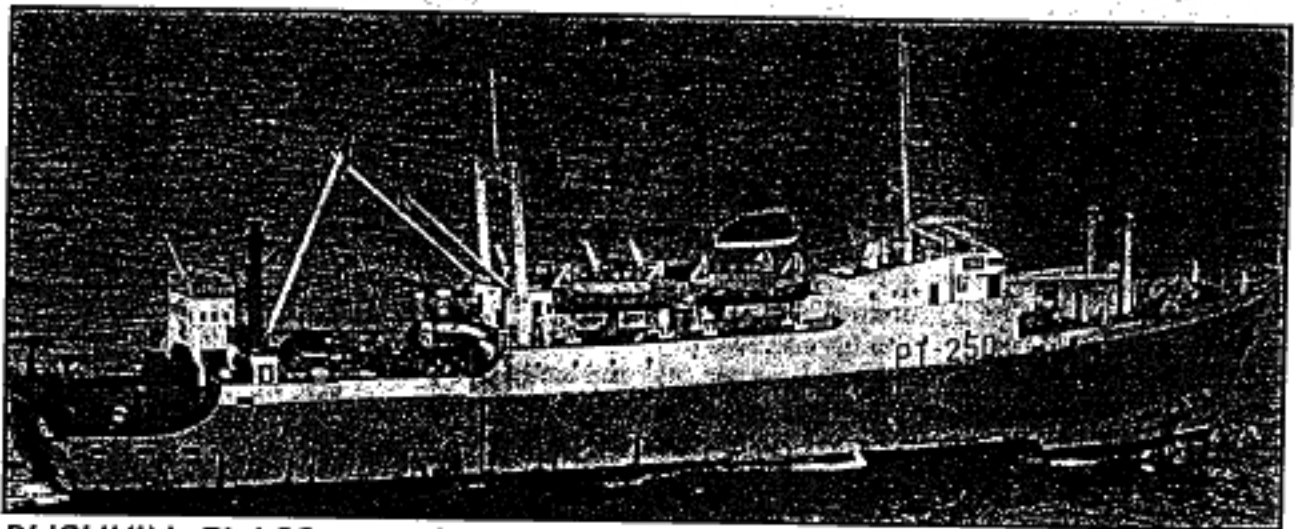
\*This illustration is confined to deliveries of known construction and does not include projections for future construction.

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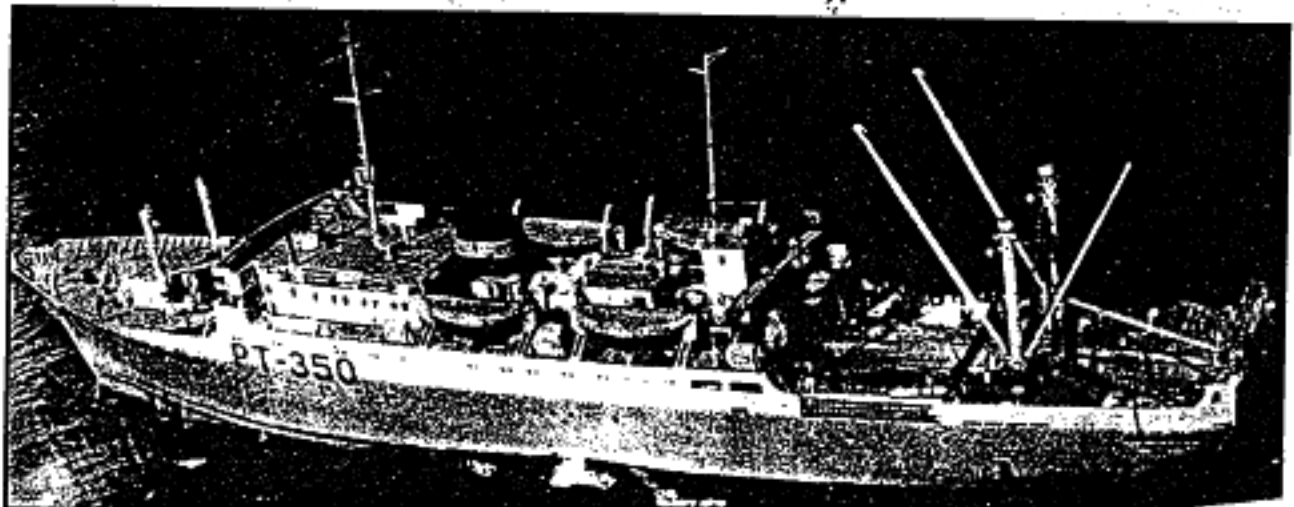
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*FAIRTRY- Constructed by the UK*



*PUSHKIN CLASS- Constructed by West Germany*



*MAYAKOVSKIY CLASS- Constructed by the USSR*

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Several studies of the cost of construction of merchant types of vessels in the USSR have yielded ruble-dollar ratios of between 5.5 to 1 and 5.7 to 1. If these ratios are applied to US costs, the cost per light ship ton\* amounts to 7,650 rubles at 5.7 to 1 and 7,380 rubles at 5.5 to 1. On the basis of a rounded average of 7,500 rubles per light ship ton, the cost of constructing in the USSR a fish factory trawler of the Pushkin class would be about 17 million rubles, or more than 400 million rubles for the 24 trawlers.

Indications are that the USSR will construct about 36 fish factory trawlers. Data on these vessels in the Soviet press show a slightly heavier vessel -- 2,420 LSD compared with 2,235 LSD for the Pushkin class. Again, on the basis of 1955 costs, at 7,500 rubles per light ship ton, each Soviet-constructed trawler will cost the USSR about 18 million rubles, or more than 650 million rubles for 36 trawlers.

As previously stated, Poland is constructing for the USSR 30 fish factory trawlers which are similar to the Mayakovskiy class. Examples of Soviet trade with Poland indicate that the USSR pays approximately world market prices for vessels built in Poland. The cost of constructing these 30 trawlers in the USSR at about 18 million rubles each would amount to 540 million rubles.

The East German contract for 85 trawlers, which is by far the largest contract for construction of fish factory trawlers, would cost the USSR more than 1.5 billion rubles to construct in the USSR. If only 65 trawlers were constructed during the Seven Year Plan, these 65 trawlers would cost the USSR about 1.2 billion rubles to construct in the USSR.

The estimated total Soviet fleet of 175 fish factory trawlers by 1967 would cost about 3.1 billion rubles to construct in the USSR. This fleet would cost more than \$560 million to construct in the US.

\* Light ship displacement (LSD) is the weight (in metric tons) of a vessel complete, ready for service in every respect, including permanent ballast and liquids in the machinery at operating levels but excluding the crew and their effects and all items of consumable or variable load such as stores, fuel, and cargo.

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## VI. Factors Favoring Domestic Construction

The prices paid to shipyards outside the USSR are based on prices approximating the world market and are believed to be less than Soviet costs of internal construction. For example, indications are that the USSR in the past purchased vessels from East Germany at a ruble-DME ratio of 1 to 2. On the basis of 17.6 million DME per trawler, the USSR would pay the equivalent of 8.8 million rubles to purchase a trawler which would cost the USSR about 18 million rubles to construct domestically.

In spite of the apparent great saving in cost that the USSR could realize by having the European Satellites and probably Western European countries construct these fish factory trawlers, the USSR is planning a large program of domestic construction. It appears that no single reason alone can explain Soviet domestic construction of fish factory trawlers rather than purchases from abroad. A number of factors undoubtedly contribute to the Soviet decision.

A shortage of foreign currency or exportable products that could be used in trade agreements with shipbuilding countries outside the Sino-Soviet Bloc appears to be a dominant factor limiting foreign shipbuilding contracts. Moreover, since 1946 the USSR has made large capital investments in its shipbuilding enterprises. These investments were both in component building plants and in fabrication and assembly plants for vessels. The greatest return from these investments lies in construction of vessels.

Another factor that apparently influences Soviet leaders to construct vessels in its own shipyards is national defense. It has been recognized for a long time in the US that the US shipbuilding industry, which includes research and development in vessel design, must be maintained during peacetime so that in case of a national emergency the US will have a fleet of modern vessels and, what is more important, an industry immediately ready to construct vessels required by the emergency.

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APPENDIX

SOURCE REFERENCES

Sources of material used in this memorandum largely were Soviet and UK press reports. Ruble-dollar ratios were obtained from ORR publications referred to herein, and comparison of US and West German ship-building costs were obtained from unpublished studies of construction-differential cost made by the US Maritime Administration.

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

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

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

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1. "Fish Factory Ship Fairtry," The Shipping World and World Shipbuilding, 16 Jun 54, p. 621. U. Eval. Doc.
  2. "Quick-Freeze Trawler Design," ibid., 4 Mar 59, p. 265. U. Eval. Doc.
  3. Promyshlenno-ekonomicheskaya gazeta, 7 Feb 59, p. 4. U. Eval. RR 2.
  4. Navy, Warsaw. 346-58, 15 Oct 58. U. Eval. RR 2.  
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