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INTERNATIONAL CONFERENCE ON
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REPORTS ON NINE STUDIES

Attached hereto is a copy of the final report of Study No. VII -
Collection and disposal of ship-generated dry garbage - submitted by
the Government of the Soviet Union.

Due to the limited number of copies available only one copy per
delegation of the report (in English) will be distributed
during the Conference.

INTERNATIONAL CONFERENCE
on MARINE POLLUTION, 1973
Final Report on Study VII
"COLLECTION and DISPOSAL of
SHIP-GENERATED DRY GARBAGE"
Submitted by the USSR

INTERNATIONAL CONFERENCE ON MARINE POLLUTION, 1973

FINAL REPORT ON STUDY VII COLLECTION AND DISPOSAL OF SHIP-GENERATED DRY GARBAGE

Leading country: Soviet Union
Associated country: Finland

The study is carried out in accordance with Section VII, Appendix II, of the Sub-Committee Report(OIX/9, 24 Sept., 1971).

The study was conducted in the following parts:

- (a) Preliminary study of the problem, preparation of questionnaires for Members of the Sub-Committee, preparation and adjustment of proposals on priority measures and long-term programmes.
- (b) Elaboration and adjustment of restrictions and prohibitions on the overboard garbage discharge for inclusion into the Draft International Convention, 1973.
- (c) Development of technical requirements and recommendations regarding the construction of ships and their equipment.
- (d) Development of recommendations on standard (interchangeable) garbage containers.
- (e) Development of requirements and recommendations for shore and floating garbage reception facilities.
- (f) Development of procedure of garbage disposal, recordings and control.

The first report on this problem was submitted to the twelfth session of the Sub-Committee in January, 1972.

This was followed by notes on further progress of the study

which was submitted to the thirteenth session of the Sub-Committee in June 1972 and to the fourteenth session of the Sub-Committee in November 1972.

These papers include the results of a study on garbage accumulation on ships of the USSR Merchant Marine, the composition of garbage, considerations on the effect of garbage on sea life, suggestions as to limitations on garbage discharged from ships, and provision of ports and ships with special equipment for the accumulation, handling and treating of garbage.

The study of existing methods of accumulation, storage, disposal and treating of ship-generated garbage has proved premature for clear-cut recommendations as to extensive application of definite methods, materials and equipment. To ensure this wide practical experience is to be accumulated and generalized with account of types of ships, conditions of operation and harbour conditions.

The following first steps are recommended:

- To supply ships with plastic bags, where possible specially designed for garbage, and to ensure simple devices for filling and sealing these bags. Ports should provide sufficient stock of bags to supply ships and ensure appropriate conditions for collecting garbage from ships.
- Passenger ships and other ships with numerous personnel should be provided with special garbage containers, where possible of standard dimensions (approved by IMCO), and compressing units. It appears that these methods may prove to be sufficiently effective for existing ships and some types of new ships.
- New passenger ships and other ships with numerous personnel are to be equipped with special means for accumulation, treating and disposal of garbage, ensuring

normal operation of these ships without violation of provisions of Annex V of the Draft Convention, 1973.

-Sufficient area for handling of garbage containers and bags should be provided on bilge water and sewage collecting craft.

The following methods require to be studied, practically tested and evaluated:

-Garbage incineration, grinding, compacting, baling, disinfection. Equipment for the above purposes should be tested in operational practice on ships of various types and sizes.

-The construction of ship units for garbage briquetting under high pressure and temperature seems prospective. Compact slabs formed by means of addition of appropriate chemicals may be utilized for port and municipal purposes.

The investigation of various incinerators has shown that for the time being this method cannot be recommended for extensive application in ports, as such equipment requires substantial space, numerous personnel and rather expensive devices for prevention of atmospheric pollution. It appears preferable to transport garbage to municipal incinerators.

The solution of this problem could be facilitated by application of precompressing units, compactors or balers enabling to decrease the garbage volume in the ratio 1:5-1:10 or more.

Practical comparison of different types of equipment and examination of the technical, economic and ecologic aspects is required.

Based on the study of this problem already completed and on corresponding studies undertaken by Finland, the USA and Japan, Draft Regulations for the Collection and Disposal of Ship-generated Garbage have been developed as recommendations for Annex IV.

The versions proposed for Annex IV were discussed and reformulated during the XIV Session of the Sub-Committee on Marine Pollu-

tion by the Working Group Representatives of the USSR, Canada, the the Federal Republic of Germany, the Netherlands, Norway, the United Kingdom and the United States of America, as well as by the representative of the International Chamber of Shipping.

The Working Group found it expedient to have a separate Annex V, incorporating Regulations covering collection and disposal of ship-generated garbage and to restrict Annex IV to sewage only.

At the Preparatory Meeting (12 February-2 March, 1973) a final draft of Annex V was prepared on the bases of proposals submitted by a number of delegations.

Consideration on the impact of overboard discharge of garbage on sea life have been presented in the first note on Problem VII submitted by the USSR and substantiated by investigations conducted by the USA and other countries.

The last draft text of Annex V to the Draft International Convention for the Prevention of Pollution from Ships, developed by the Working Group of experts during the XIV Session of the Sub-Committee, has not been subjected to criticism and it may be deemed that the said draft on the whole would principally suit for the majority of countries.

A special problem is the development of additional restrictions for Special Areas.

Taking into account the diversity of ecological, hydrometeorological and other specific features of each special area, it would be expedient to develop restrictions on the base of regional agreements arrived at on the grounds of Annex V to the International Convention 1973.

The enforcement of Annex V will aid by far in the sharp decrease of pollution of the sea surface, the sea bed and coastline caused by ship-generated garbage, thus reducing serious hazard to human environment and safety of navigation.

But main objective remains the complete elimination of sea pollution by ship-generated garbage.

Hence it is suggested that the following Resolution should be incorporated in the Resolutions to be adopted by the International Conference:

"The development of ways and special equipment for accumulation, disposal and treatment of ship-generated garbage should be fostered in the nearest future to achieve complete elimination of pollution of the sea, the sea bed and coastline caused by ship-generated garbage. Studies on the impact of garbage on sea life should be undertaken."

Taking note of ecological aspect of the problem and of the work initiated in a number of countries and aimed at the accumulation, disposal and treating of ship-generated garbage it is recommended to organize a systematic exchange of technical information on the subject and a periodical revision of the recommendations within the frame of IMCO Committee.

Appendix 2 comprises a draft text of the recommended Program of future studies and developments on the strength of which further steps could be taken to achieve the complete elimination of sea pollution by ship-generated garbage.

In compliance with the recommended Program the following measures are envisaged in the USSR:

Two passenger ships under construction in Finland are to be provided with different types of equipment for treating and incineration of garbage.

The test results of the equipment under operation as well as the estimation of different ways of collection and treating of garbage should be presented for distribution among members of the IMCO Committee on the Prevention of Pollution.

APPENDIX I

**QUANTITY AND VOLUME OF GARBAGE
PER PASSENGER AND CREW MEMBER**

**SPECIFIC DAILY VOLUME, QUANTITY AND VOLUME
OF GARBAGE PER PASSENGER AND CREW MEMBER**

Kind of voyage	Daily garbage				
	Specific volume Cub. m/ton	Average quantity per passenger kg/man per day	Average per crew member kg/man	Average vol. per passenger cub. dm/man per day	Average vol. per crew member cub. dm/man per day
Cruises	2,45	1,20	1,10	2,80	2,70
Complex tariff voyages	2,50	1,10	1,10	2,60	2,60
Ordinary passenger voyages	2,30	0,80	0,80	1,80	1,80
Dry Cargo Vessels	1,90	1,10	1,10	2,10	2,10

**AVERAGE DAILY ACCUMULATION AND COMPOSITION
OF GARBAGE; SUBMITTED BY OTHER COUNTRIES**

Country	Average daily rate of garbage per man, kg	Composition of garbage, kg		Note
		Galley waste	Paper and other waste	
Finland	2,00	-	-	
Japan	2,56	2,40	0,15	
The USA	1,68	1,40	0,28	
The Netherlands	4,00	-	-	
Gr. Britain	3,50	2,00	1,50	

AVERAGE DAILY ACCUMULATION AND COMPOSITION OF GARBAGE

Number of people on board			Composition, % %													
Total	Among them		Victual Waste	Paper	Textile	Timber	Glass	Metal	Synthetic materials	Bones	Rust	Ashes	Rubber	Dry paint	Flowers and sweepings	
	Crew	Passengers														
1300 - 1500	250-350	1050-1150	66,4	17,8	3,5	1,8	<u>Cruises</u> 4,0	3,2	0,1	1,1	0,03	-	0,03	0,04	2,0	
300-700	200-250	100-450	53,5	<u>Voyages with complex tariffs for passengers (with prepaid meals)</u>												
				17,7	2,5	1,7	13,1	7,2	0,4	3,4	-	-	-	0,1	0,4	
				<u>Ordinary Passenger Voyages</u>												
300-700	200-250	100-450	57,6	18,8	7,5	1,5	3,2	6,4	0,3	1,7	0,1	1,8	-	0,1	1,0	
30-50	30-50	-		<u>Dry Cargo Vessels and tankers</u>												
			57,4	2,9	24,8	7,2	0,3	0,7	-	3,4	-	-	0,2	1,9	1,2	
Average data			53,5-	2,9-	2,5-	1,5-	0,3-	0,7-	0,1-	1,1-	0,03-	1,8-	0,03-	0,04-	0,04-	
			66,4	18,8	24,8	7,2	13,1	7,2	0,4	3,4	0,1	0,2	0,2	1,9	2,0	
Averaged data			60,0	15,0	3,0	6,0	7,0	5,0	0,3	1,5	0,1	-	0,1	0,5	1,5	

APPENDIX II
DRAFT PROGRAM ON FURTHER STUDIES
AND DEVELOPMENTS FOR THE PREVENTION
OF POLLUTION FROM SHIPS

**I. Marine Ecological Effects of Ship Generated Garbage
Within the Contiguous Zone and Beyond the Contiguous
Zones**

- Impact of food and food contaminated waste on the sea life and on beaches(resort areas).
- Potential risk of infection transfer(for human beings and animals).
- Potential risk of vermin transfer(fruit and vegetable waste).
- Impact of cargo associated garbage on sea life(residues of chemicals etc.)
- Impact of cargo associated garbage on shore life (vermins in solid wooden waste:dunnage, packages and timber)
- Impact of floatable and sinking solid waste on sea life(surface and bottom)and beaches.

II. Impact of Solid Garbage On Safety of Navigation

- Danger of collision of fast-sailing ships(for example hydrofoils)with solids(timber, drums etc.)
- Danger of ropes and nets winding on ship propeller.
- Danger for fishery.

**III. Treating Food Waste in Grinders with Subsequent Disposal
into Sewage Holding Tanks**

- An investigation of the process at all stages:
 - Optimum grinding procedure.
 - Increase of volume of holding tanks.
 - Increasing the duration of biological degradation.
- Operation experience.
- Economic aspects.
- Recommendations for new and existing ships.

IV. Precompression of Garbage

- Study of existing equipment and estimation of favourable parameters and dimensions(rigid and plastic containers etc.)

- Study of technical and economical aspects.
- Comparison of different methods and alternative solutions.
- Development of recommended standard solutions for certain ship types.

V. Plastic Bags and Containers

- Study of existing garbage bags and devices for their fastening and sealing.
- Study of existing garbage containers and devices for their disposal.
- Development of recommended standard sizes.

VI. Incinerators

- Investigation of the problem with regard to air pollution, fuel consumption and destruction of some materials that might be reused(dunnage,etc)
- Study and evaluation of existing equipment.
- Development of recommended solutions for certain cases,when employment of the incinerators is found to be a good practice.

VII. Compactors and Balers

- Study of existing equipment and its practical operation on board.
- Study of economical aspects.
- Development of recommendations for certain ship types.
- Development of advisable standard sizes and parameters.

VIII. Rational Shipboard Combinations

- Development of rational combinations economically sound and reliable in operation;for instance:
 - compactor(baler)+incinerator;
 - plastic bags+incinerator;
 - precompression+incinerator;
 - grinder+compactor(baler)+incinerator;
 - compactor(baler)+holding space + disposal devices.

IX. Shore Side Reception and Treating Equipment

- Garbage collecting craft(special or other purpose).
Development of internationally approved requirements (disposal means, etc.)
- Mobile shore units for reception and disinfection of cargo associated waste. Development, testing and approval.
- Stationary harbour incinerators and other garbage treating equipment.

X. Further Studies and Developments(Prospects)

- Creation on board units for garbage briquetting under high pressure and temperature, producing rigid slabs suitable for further utilisation ashore.
- Development of new garbage treating methods to provide efficient disposal of all kinds of garbage without any harm to the environment.