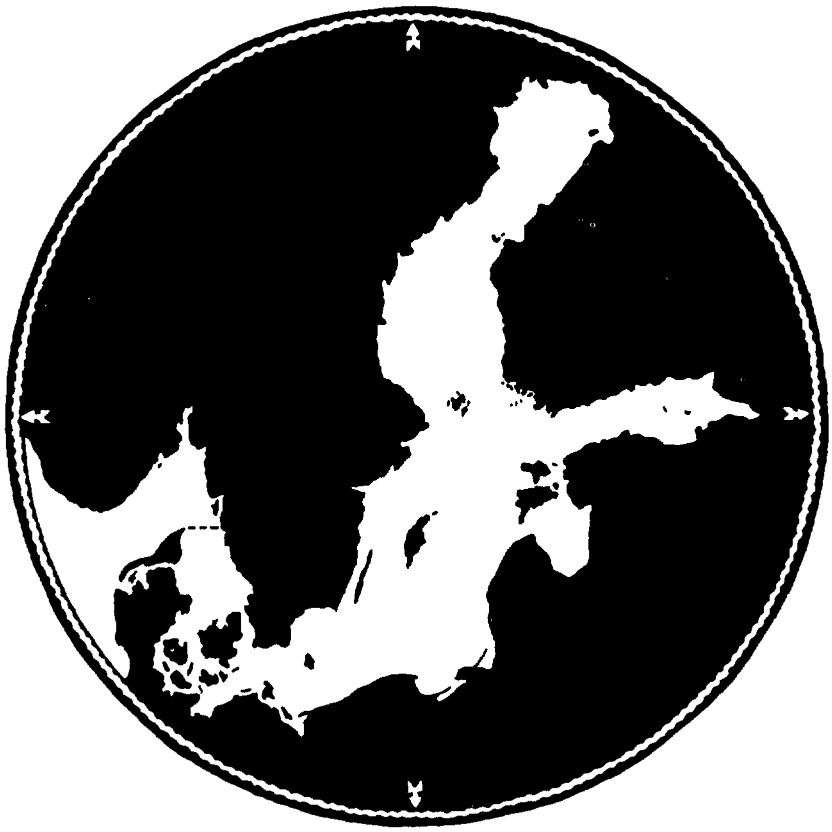
BALTIC SEA ENVIRONMENT PROCEEDINGS

No. 21

SEMINAR ON REGULATIONS CONTAINED IN ANNEX II OF MARPOL 73/78 AND REGULATION 5 OF ANNEX IV OF THE HELSINKI CONVENTION

National Swedish Administration of
Shipping and Navigation

17-18 November 1986
Norrköping, Sweden



BALTIC MARINE ENVIRONMENT PROTECTION COMMISSION
-- HELSINKI COMMISSION --

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INTRODUCTION

ANNEX IV to the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1974, (Helsinki Convention) contains regulations on the prevention of pollution from ships and Regulation 5 of this Annex contains provisions on measures to protect the sea against pollution by noxious liquid substances carried in bulk. The provisions of Regulation 5 correspond to the regulations of Annex II to MARPOL 73/78 relating to the discharge of noxious liquid substances and the establishment of reception facilities for residues and mixtures containing such substances. The provisions of Regulation 5 entered into force 1 January 1986 and they have by means of Recommendations adopted by the Helsinki Commission been kept in line with the amendments to Annex II to MARPOL 73/78 agreed within IMO.

The Helsinki Commission endorsed at its 7th meeting in February 1986 a proposal for a seminar to review the progress made in the protection of the Baltic Sea Area from pollution caused by noxious liquid substances carried in bulk by ships, and to provide a forum where various problems arising from the implementation of Regulation 5 could be discussed.

The seminar was organized by the National Swedish Administration of Shipping and Navigation and held at their headquarters in Norrköping, 17-18 November 1986. The seminar was opened by the Director-General of the Administration, Mr. Kaj Jan&us, and administrators and scientists from the seven Contracting Parties to the Helsinki Convention, as well as a number of participants representing shipowners and industry attended the seminar.

Mr. Bengt Erik Stenmark, Director of Maritime Safety, National Swedish Administration of Shipping and Navigation, was Chairman of the seminar.

At the seminar, information of the transport of chemicals in the Baltic Sea Area by ships was exchanged. Experiences and problems in connection with the implementation of Regulation 5 of Annex IV of the Helsinki Convention were discussed. The papers presented at the seminar are compiled in this publication.

As endorsed by the 7th meeting of the Helsinki Commission an ad hoc group of experts was convened on the 18th November to evaluate the seminar and identify items which would merit further consideration within the Helsinki Commission framework. The Group was chaired by Mr. Gorbatsev, USSR Ministry of Merchant Marine and the results of the Group's deliberations are contained in Section E of this publication.

The results were considered by the 12th meeting of the Maritime Committee (MC), Helsinki, 24-27 November 1986 and the follow-up actions taken by the Committee as well as by the 8th meeting of the Helsinki Commission, Helsinki, 24-27 February 1987, are summarized in Section F.

The organizers of the seminar would like to thank the authors for their contributions, the participants for taking active part in the discussions and the city of Norrköping for their hospitality and co-operation in connection with the seminar.

OPENING OF THE SEMINAR

Mr. Kaj Janérus
Director-General,
The National Swedish Administration of
Shipping and Navigation

On the 1st of January 1986 the regulations for the control of pollution by noxious liquid substances in bulk in the Baltic Sea Area entered into force. This was through the delayed entry into force of Regulation 5 of Annex IV to the Convention on the Protection of the Marine Environment of the Baltic Sea Area. In fact the measures which have been incorporated in the Swedish legislation are those based on a recommendation of the Helsinki Convention.

One may wonder as to why Regulation 5 of Annex IV to the Helsinki Convention was not applied. The answer is simple; the standards which had been in development at IMO were after years of experimenting and field trials, found incompatible with the trade. This made compliance with the discharge regulations of Annex II and Regulation 5 of Helsinki Convention difficult for ships. Now, if compliances by ships is difficult it becomes much more onerous for the authorities to enforce the regulations. This is often forgotten while drawing up conventions. The result being that the effectiveness of a legislation cannot be measured and in general cannot be felt.

The technical requirements in a convention reflect the strength of the convention. Thus in the last couple of years, mainly 1984 and 1985, enormous energy was put in at IMO to refine the regulations and associate documents for the prevention of pollution by noxious liquid substances in bulk and make them effectual.

The regulations and the accompanying standards which are referred to in the discharge regulations of Annex II of MARPOL and Regulation 5 in Annex IV to the Helsinki Convention were amended and made compatible with shipboard operations and it is our view that, for the serious operators of ships, the requirements as they are now can be complied with without any great difficulty.

But of course certain planning in ship operations would be necessary to accommodate the new regulations and this effort is well deserved by the marine environment.

The well-being of the marine environment is not only vital for the bountiful of food it provides us with, the economic routes for trading between nations of the world, the recreation it provides us with when we are tired with our daily chores and not to forget the oxygen we breathe. Water is one of our most basic needs for survival.

The UN Joint Group of Experts (GESAMP) assisted IMO during the development of the regulations which were based both on practical trials and a scientific basis. Thus the sea is to receive those insignificant quantities that remain in the ship after unloading of the cargo and that have been determined harmless if discharged into the sea under certain conditions. If however, there remain excessive quantities on board these would have to be transferred to reception facilities using the "prewash" - a term all of you must be familiar with by now.

One of the most debated topics of the MARPOL is the availability of reception facilities for residues which are not permitted to be discharged into the sea. The two basic principles adopted in amending the MARPOL Annex II regulations recognise the need to simplify the complex operational discharge requirements and to help determine more accurately the capacity and types of reception facilities required to fulfil the needs of the ships.

By stipulating a requirement by which ships will be capable of emptying their cargo tanks to negligible quantities while discharging the cargo, with conscientious and well trained crews and serious operators, the need to use reception facilities belong more to exception rather than to the rule. However, there will be situations when ships will need to use reception facilities. Cargoes which are solidifying or highly viscous can leave excessive quantities in a tank and these being prohibited from being discharged into the sea must go ashore.

Furthermore, in sensitive sea areas of the Baltic, quantities of certain substances which may be permitted to be discharged elsewhere become harmful and will thus have to be discharged ashore or retained on board for discharge in areas where it is acceptable and permitted.

I would assume that with such a realistic approach the burden on the reception facility is a minimum and with the concept of "mandatory prewash", which Sweden advocated in the IMO, the uncertainty of what will happen with the excessive quantities of harmful sustances remaining in a ship after unloading is removed. This also reduces the interference between ports; as one port may not be prepared to receive the residues resulting from a cargo discharged at another port without prior arrangements.

The price for disposal will ultimately be borne by the consumer. It is we who are the consumers and as such have morally accepted to take care of the waste generated by our activities.

We should not put the blame on shipowners, or administrations or the industry for the condition of the seas. Each of us is equally responsible. The responsibility to protect the marine environment from the deliberate, negligent and often forced discharges lies with the master and his crew, with the owners, the charterers, the port authorities, and the cargo receivers.

The master and his crew for following the correct operational procedures and maintaining the equipment.

The owners for providing detailed instructions in the form of comprehensive manuals. He should employ well trained crews and take active interest in updating their knowledge.

The charterer should ensure that the ships chartered by them comply with all the relevant provisions and that the terms and conditions of charter permit such compliance.

Ports and receiver of the cargo should be prepared to accept the residues which are not permitted to be discharged into the sea.

The shipbuilder should not only optimize in steel weight and fuel efficiency but on designs which minimize the risk of pollution.

The flag state to ensure that its ships are built and maintained to the standards.

The port state to ensure that the facilities required by the ship visiting its ports are available and that the foreign ships have the same standard as its own ships.

By nature all of us are different and have a different approach. The goal is however the same. Similarly those sharing the responsibilities to improve and protect our marine environment may have different paths and aspects. Without appreciating each others views a task or common responsibility becoms a burden.

We are all assembled here to discuss and ventilate our views on the application of the rules governing the discharge into the sea of noxious liquid substances carried in bulk and I hope that the outcome of this seminar will leave us with a better understanding for each other which is of paramount importance for the successful implementation of the Convention.

I am convinced that your working sessions will be most fruitful.

With these words I want to express to all of you a most heartily welcome to Sweden, the city of Norrköping and our shipping administration and declare the seminar opened.

SECTION A,

SESSION 1: CLASSIFICATION OF CHEMICALS

1.1 Introduction into the work of GESAMP and an indication of problem areas within the hazard evaluation work for MARPOL 73/78.

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1.3 Discussions on Session 1.

1,1 INTRODUCTION INTO THE WORK OF GESAMP AND AN INDICATION OF PROBLEM AREAS WITHIN THE HAZARD EVALUATION WORK FOR MARPOL 73/78

HISTORICAL BACKGROUND

In 1969 the Assembly of the Inter-Governmental Maritime Consultative Organization (IMCO, i.e. the predecessor of IMO; the International Maritime Organization) decided to convene an International Conference for the purpose of preparing a suitable international agreement for placing restraints on the contamination of the sea, land and air by ships and other equipment operating in the marine environment.

Late in 1971, in the course of preparing for the International Conference on Marine Pollution, which was held in 1973, the Sub-Committee on Marine Pollution of IMCO experienced considerable difficulty in categorizing pollution hazards of substances carried by ships in a way which could be utilized in the development of control measures. As a means of solving the problem the Sub-Committee on Marine Pollution prepared a detailed enquiry requesting GESAMP (IMCO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP JOINT GROUP OF EXPERTS ON THE SCIENTIFIC ASPECTS OF MARINE POLLUTION - GESAMP) to examine a number of lists of chemicals and products and to consider the hazards which these substances might pose to the aquatic environment. A copy of the enquiry is attached to this report as Annex 1. At that time (late 1971) it was the intention that the International Convention, which was to be developed in 1973, should contain regulations for the prevention of pollution by oil, noxious liquid and solid dangerous chemicals carried in bulk, harmful substances carried in packages, portable tanks, freight containers or road or rail tank wagons, as well as sewage and garbage from ships.

The International Conference on Marine Pollution in 1973 adopted the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73)*). The Convention in its Annex II contains detailed requirements for the discharge criteria and measures for control of pollution by noxious liquid substances carried in bulk. For this purpose noxious liquid substances are divided into four categories depending upon their hazard to marine resources, human health, amenities and other legitimate uses of the sea. Some 250 substances were categorized by an Ad Hoc Panel and were included in the list appended to Annex II to the Convention.

Following the conclusion of the Convention, GESAMP agreed to undertake the on-going task of evaluating the environmental hazards of additional substances carried by ships, and a Working Group was established. This met for the first time in 1974 and has since met on 20 more occasions. Both the terms of reference and the membership of the Working Group have changed over the years, although an effort has always been made to maintain continuity in membership. The two sets of terms of reference are shown in Annex 2.

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*) MARPOL 73 covers all the technical aspects of pollution from ships, except disposal of land-generated waste into the sea by dumping and discharge of substances directly arising out of the exploration and exploitation of sea-bed mineral resources. It consists of Articles, two Protocols dealing respectively with reports on incidents involving harmful substances and arbitration, and five Annexes which contain regulations for the prevention and control of marine pollution by:

(1) oil;
(2) noxious liquid substances carried in bulk;
(3) harmful substances carried in packages, portable tanks, freight containers, or road or rail tank wagons, etc.;

(4) sewage from ships; and
(5) garbage from ships.

The International Conference on Tanker Safety and Pollution Prevention, 1978, by adopting the 1978 MARPOL Protocol modified the provisions of the Convention, referred to hereafter as MARPOL 73/78.

Using the definition of pollution adopted by GESAMP **) the Ad Hoc Panel was asked to evaluate substances according to the hazards they might pose when released into the sea for the following four considerations:

(1) damage to living resources;
(2) hazards to human health;
(3) reduction of amenities; and
(4) interference with other uses of the sea.

**) The working definition of marine pollution adopted for the purposes of GESAMP is "Introduction by man, directly or indirectly, of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazard to human health, hindrance to marine activities including fishing, impairing of quality for use of sea water and reduction of amenities".

EXPLANATION OF THE HAZARD EVALUATION STEPS

Prior to the 1973 Conference, no records of the basis of decisions were kept by the Ad Hoc Panel. Subsequently it was recognized that from time to time questions would be raised as to the information used in the derivation of the hazard profiles. It was therefore agreed, at the first meeting of the GESAMP Working Group (1974), that a data sheet should be completed for each substance for which a hazard profile was assigned. These sheets are stored at IMO for future reference and updated as necessary.

Most of the substances originally assessed by the Ad Hoc Panel have subsequently been re-examined by the GESAMP Working Group. Where this is the case, data sheets have been prepared. The data sheets are the property of GESAMP and as such are intended as working records. They are not made available to outside persons, although details can be be made available on request through the IMO Secretariat of GESAMP in consultation with the Chairman of the Working Group.

Each substance is listed under a commonly accepted chemical name. Where substances are commonly known by several such names, those names are listed but the hazard profile is given under one name and the reader is referred to that name and entry at each of the additional entries. It is recognized that various formal nomenclature systems exist but, as these are not universally adopted the Working Group has used these names of substances listed in the Bulk Chemicals*) and Dangerous Goods Codes**) developed by IMO.

*) Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk;

**) International Maritime Dangerous Goods Code.

COLUMN A - BIOACCUMULATION

Bioaccumulation occurs if an aquatic organism takes up a chemical to which it is exposed so that it contains a higher concentration of that substance than is present in the ambient water or its food. The process is usually reversible, although the rates of loss may be substantially slower than the rate of uptake. Where the rate of metabolism or elimination of the substance is high and the degree or period of exposure is small, bioaccumulation may be short-lived. Where the rates of metabolism or elimination are low or the degree or period of exposure great, bio-accumulation may be of long duration.

Four symbols have been adopted and are as follows:

"+" Refers to a substance which is known to be accumulated to a significant extent by marine organisms, which is not readily excreted or degraded into a less harmful metabolite by the organism and which as a consequence is known, or to man if he eats the organism. Examples are mercury compounds and DDT.

"T" Refers to a substance which is known to be accumulated by marine organisms with the result that sea food is tainted and rendered unpalatable.

"Z" Refers to a substance which is known or strongly suspected to be accumulated by marine organisms but which is rapidly lost (half-life of about 1 week or less) by that organism when it moves or is moved from the zone of exposure.

"O" Indicates a substance for which there is no evidence to support one of the above ratings (+, T or Z).

COLUMN B - DAMAGE TO LIVING RESOURCES

Direct toxic effects

In order to rank the hazard posed to living resources the most practical solution available was considered to be the use of acute toxicity test data. Wherever possible 96 hr TLm* data relating to marine species are used and wherever possible the Working Group use data relating to adult or juvenile stages of organisms representing the middle to upper levels of an aquatic food chain, e.g.

crustacea or fish. Where data are not available for marine species but are available for freshwater species these may be used after due consideration of the possible effect on toxicity of the different water medium. Where data are available for several species, generally the figure which indicates the greater degree of hazard is used.

COLUMN C AND D - HAZARDS TO HUMAN HEALTH

It was considered that as a consequence of pollution of the sea or water ways a substance might pose a hazard to humans by one or more of three possible ways, namely:

(1) through ingestion of fish or shellfish which have accumulated toxic substances;
(2) from ingestion of water containing the substances;
(3) from the adverse action of the substances or its vapour or the substance in solution, on the skin, eyes, or respiratory tract, or through absorption via the skin to affect internal organs.

The first of these routes was considered amply covered by the bioaccumulation assessment under Column A but the other two routes were considered worthy of separate assessment; the latter being particularly relevant in the context of consideration of the potential impact on amenity interests.

COLUMN C - INGESTION OF WATER CONTAINING THE CHEMICAL

It was recognized that ingestion of water contaminated by the substance being assessed may pose both an acute and long-term problem. However, it was considered that consumption of contaminated water was likely to be rare and to extend over a short time period, and it was therefore considered that the acute toxicity situation was that which needed to be guarded against.

COLUMN D - RISK TO HUMAN HEALTH VIA SKIN OR INHALATION

It was recognized that some substances, their vapours or aqueous solutions, may cause irritation or injury to the skin, mucous membranes or eyes. A few substances may also cause allergic reactions in a proportion of an exposed population. Some chemicals are readily absorbed through the skin and may cause injury to internal organs. Because of their physical properties, certain substances carried by ships are liable, in the event of spillage, to contaminate beaches. These may pose a particular hazard to human health from direct contact or from inhalation of their vapours.

COLUMN E - REDUCTION OF AMENITIES

It was agreed at the outset that amenities should be understood to embrace all aspect of recreational use of the aquatic environment including its appearance. Thus reduction of amenities may be a consequence of the presence of poisonous, irritant or foul-smelling or appearing substances that may be released by ships. Objectionable slicks, floating scums or other floating or suspended materials on the sea surface or on the beach may also result from such releases. Impariment of scenic values may also be brought about by discolouration of the water, or by conversion of some of the liquid substances into solids, by polymerisation on exposure to air and sunlight.

A hazard to human health may occur if noxious liquid or solid substances, contained in drums or packages, are lost from a ship and are washed up on the shore. The Working Group was aware of many such incidents, some involving highly hazardous chemicals and others quite harmless ones. Particular note is taken if substances have the potential for chronic health effects e.g. cancerogenic properties.

AMENDMENT PROCEDURES

It has always been recognized that for many substances only tentative hazard assessments will initially be possible. Subsequently it is hoped that additional information will become available which confirms the tentative rating, or at least allows a firm rating to be assigned. It is also recognized that test procedures are improving and that new data may become available which may necessitate a review of earlier assessments.

Furthermore, from time to time hazard assessments are challenged either by individual manufacturers, trade associations, or by government administrations or Sub-Committees of IMO. The proper procedure by which new information should be brought to the attention of the Working Group is that it should be provided in full to the IMO Technical Secretary for GESAMP at IMO Headquarters in London, who will bring it to the attention of the Working Group at the next possible opportunity.

SOURCES OF AND REQUIREMENTS FOR DATA

The information used by the Working Group in assigning hazard profiles to substances comes from a wide variety of sources. In recent years the Governments of the United States of America, the United Kingdom of Great Britain and Northern Ireland, Sweden, Japan and the Netherlands have provided information on short lists of substances. This has saved considerable time and effort on the part of the Working Group, although it has not of course eliminated the need for careful cross-checking of available information or comparison with other data. IMO has developed a questionnaire which governments are expected to complete when submitting new substances or proposals for shipping regulations.

For the most part, however, the Working Group has had to seek data from various literature sources and to make its own assessment of which information should be given the most credence. The source of data used is recorded on the data sheets for individual substances which are filed at IMO Headquarters. As the work has progressed the Working Group has encountered increasing problems of deficiency of data. These have been particularly obvious in relation to the effect on living resources. Unless data are available for a similar substance a rating is not possible for such substances until data are provided; this may require the commissioning to toxicity test by the interested party. Concern has been expressed that the resultant data might not meet the standards of current laboratory techniques. Accordingly the advice of the Working Group has occasionally been sought with respect to the type of aquatic toxicity test which should be conducted.

ANNEX 1

INQUIRY TO GESAMP

The Inter-Governmental Maritime Consultative Organization (IMCO) has scheduled an International Conference on Marine Pollution for the fall of 1973. Presently under consideration is a draft convention which will address pollution of the marine environment by the marine transportation of bulk and package "noxious substances"; a "noxious substance" being a product or concentration of a product, other than oil, sewage or garbage or refuse, yet to be defined.

The following decisions are examples of those that have to be made by the Conference concerning the marine transportation of "noxious substances" to minimize any damage to the marine environment.

1. What degree of containment is required, that is, the structure of vessels carrying the products in bulk or the containers for packaged shipments?

2. What degree of sophistication is required for cargo (product) handling and control?

3. What limit, if any, should be placed upon cargo (product) shipment size?

4. What limit, if any, needs to be placed upon the intentional discharge of substances in the process of tank washing?

5. What degree of operational control must be placed upon vessels carrying "potential noxious substances"?

The decisions to be made concerning the carriage of "noxious substances" will directly affect mankind in general by not only protecting the environment but changing the cost or even the availability of certain products basic to his society. IMO must make these decisions and solicits the assistance of GESAMP in reaching these decisions.

Therefore, IMO requests GESAMP to review the attached list of products and consider their hazard to the environment if released accidentally or deliberately into the water.

Specifically GESAMP is requested:

(1) to evaluate substances under at least four degrees of hazard, according to each of the following effects when released into the sea:

- (a) damage to living resources;
- (b) hazards to human health;
- (c) reduction of amenities;
- (d) interference with other uses of the sea;

in doing so, take into account the release in the following four forms:

- (I) through normal operation of ships other than the disposal of shore-generated waste;
- (II) through marine casualties to ships carrying cargoes in bulk;
- (III) through marine casualties to ships carrying cargoes in packages;
- (IV) through accidental spillage (e.g. overflow).

(2) to indicate how their hazard ratings apply to areas such as rivers, estuaries, inshore waters, enclosed seas, and deep ocean, under the different climatic conditions,

(3) to specify as far as possible criteria and critical parameters used in determining hazard ratings of the substances.

IMO is prepared to provide such information as it has and to assist GESAMP as much as possible in this extremely necessary and important task. The time constraints dictate an urgent response from GESAMP. It would therefore be desirable to receive their reply if possible by 31 May 1972.

ANNEX 2

TERMS OF REFERENCE

1. Terms of reference given by GESAMP at its sixth session (Geneva, 22-28'March 1974) to the Working Group on the Evaluation of the Hazards of Harmful Substances in the Marine Environment:

(1) to examine and evaluate available data and to provide such other advice as may be requested, particularly by IMO, for evaluating the environmental hazards of harmful substances carried by ships, in accordance with the rationale approved by GESAMP for this purpose (GESAMP IV/19/Supp.1); and

(2) to examine annually the Review of Harmful Substance (GESAMP Reports and Studies No.2, New York 1976) in accordance with Recommendation 88 of the United Nations Conference on the Human Environment (Stockholm, 5-16 June 1972) in order to amend the Review if and when appropriate.

2. Terms of reference amended by GESAMP at its eighth session (Rome, 21-27 April 1976):

The second part of the terms of reference concerning the updating of the Review of Harmful Substances was deleted and consequently the title of the Working Group was changed to "Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships".

1.2 FINNISH CLASSIFICATION OF CHEMICALS HAZARDOUS FOR THE ENVIRONMENT

INTRODUCTION

In Finland a committee made a proposal for a new chemical act this year. The new act will replace our present Poison Act and additionally includes regulations concerning classification and labelling of chemicals hazardous for the environment. The act proposal made by the committee also include regulations for new substances, i.e. premarketing notification procedure. The manufacturer or importer of a new chemical substance shall report among others proposal for classification and labelling of the substance provided in chemical act.

In the field of the Ministry of the Environment one important task in preparing the new legislation was the definition of "hazardous for the environment". In practice, the chemicals will be divided into at least two groups, i.e. those considered hazardous for the environment and those not considered hazardous in the sense determined by the legislation. A chemical hazardous for the environment will probably be defined as: "chemical substance or product which, when released into nature, even in minute amounts, causes serious damage to nature".

METHODS USED FOR TESTING ECOTOXICITY

Assessment of ecotoxicological hazard is much more complicated than assessment of toxicological hazard. OECD test guidelines and some other standard methods provide a valuable basis for testing. However, most of the published ecotoxicological data are not based on tests done by any standard method. Pesticides are an exceptional group among all chemicals - they have almost traditionally been tested even ecotoxicologically.

Physico-chemical properties are often the first available data of a new chemical. This data can be used for compartmentalization which is often useful for the first phase estimation of environmental hazard but cannot be used for classification without ecotoxicological data. Structure activity analyses (SAR) can also be used in prediction of the environmental hazard. However, quantitative SAR (QSAR) is available only for some groups of chemicals.

In ecotoxicological testing aquatic organisms have most often been used. Many of the test methods used have been standardized nationally or internationally. Most of the available data exist in primary literature and the bioassays have not been carried out by any standardized method. The combination of algae-Daphnia-fish recommended by OECD is good for assessment because the organisms represent different trophic levels.

With plants numerous test methods have been established but they are not used systematically for testing the toxicity of chemicals. The majority of the data available originates from unique scientific experiments and their use in administrative assessment is difficult. Seed germination test is one of the few standardized test methods with plants.

Micro-organisms are also useful in ecotoxicological testing: they can for example be used in toxicity, mutagenicity and biodegradation tests. Micro-organisms are well adaptable to changes and therefore the definition of "serious damage" is complicated and the interpretation of results is subject of wide disagreement.

With soil invertebrates and insects pesticides are the only well-tested group of chemicals. However, for the majority of commercial chemicals such data do not exist. Some standardized test methods are available.

With birds many standard test methods for acute toxicity and reproduction effects are available and several hundred chemicals (mainly pesticides) have been tested. Some data from field conditions are also available.

The results of classical toxicology are useful also in the ecotoxicological assessment. The test methods have been standardized and a large number of chemicals have been tested. However, some of the tests are not relevant in ecotoxicological testing (skin sensitization, eye irritation).

Model ecosystems are the most sophisticated form of ecotoxicological testing. However, interpretation of the test results is complicated and therefore difficult to use in classification. Probably in the near future microcosms will give us a lot of information about the behaviour and chemical fate of chemicals in the environment.

Persistency and bioaccumulation are the most important factors modifying ecotoxicity. Interpretation of the OECD biodegradation tests in cold climate may be difficult. Some confusing factors may also exist: formation of toxic persistent metabolites, variation of persistence in different environmental conditions and binding into particles. Bioconcentration factor gives the best information of the bioaccumulation potential of a chemical - the usefulness of octanol/water coefficient is more limited because of differences in penetration and metabolic processes.

CRITERIA USED IN THE CLASSIFICATION

When classifying a chemical, the authority/producer has to consider the chemical's toxicity to:

mammals
aquatic organisms
birds
insects and soil macrofauna
higher plants and
other comparable properties which may cause serious damage to the nature.

In addition to toxicity, persistence and bioaccumulative properties of a chemical have to be considered. The Ministry of the Environment ordered a series of reports from specialists concerning chemicals' toxicity to different groups of organisms.

In a register made by the National Board of Waters more than 5000 test results with aquatic organisms for about 1000 chemicals sustances are included and a proposal for a classification system is presented. In the proposed classification the maximal concentration magnitude (100 - 1000 g/l) is classified as 0 and the next magnitude is classified as 1 etc. The verbal terms used are as follows:

toxicity	classification	mg/l
harmless	o - 2	1000 - 1000000
harmful	3 - 4	10 - <1000
hazardous	5 - 6	0.1 - <10
extremely hazardous	7 -	(0.1

Only those compounds were classified in which at least three different test results were available. The smallest effective concentration was used in the classification if it did not differ from the next one by more than

one order of magnitude. The results used in the classification indicated increased mortality (LC50/EC50) or decreased reproduction. Of the approximately 1000 substances covered by the report, in terms of this classification some 19% of the substances were designated hazardous, while further 12% were considered extremely hazardous. The majority of substances in the latter group were active ingredients of pesticides.
The register can be used by a computer and it consists of the name of the chemical, synonyms, CAS-number, test results and references.

A working group set up by the Ministry of the Environment made recently a classifiction proposal in which following criteria were used:

(1) toxicity to mammals: acute LD50 value for rat (orally) is less than 200 mg/kg or acute LC50 value for rat (inhalation) is less than 2 mg/l;

(2) toxicity to water animals: LC50 value is less than 10 mg/l;

(3) toxicity to birds: LD50 value for birds is less than 100 mg/kg

(4) tendency to accumulate in organisms: bioconcentration (BCF) factor is more than 100; if BCF is not available then octanol/water partition coefficient is more than 1000;

(5) persistence: if sustance is not "ready biodegradable" (OECD 1981) or its half-life in soil is more than 90 days;

(6) other comparable properties which can indicate that the substance may cause serious damage to nature (reproduction, carcinogenesis etc.).

Except for bioaccumulation and persistence a chemical is classified as hazardous for the environment if any of the classification criteria is met.

The above criteria were partly based on an EEC proposal and partly they have been made on the basis of the reports made by Finnish experts. The'criteria were tested by collecting data of about 350 chemicals which were known to be toxic or which were commonly used in Finnish industry. Approximately 220 of them were classified as hazardous for the environment.

CONSEQUENCES OF CLASSIFICATION

On the basis of the Committee's proposal following obligations will be imposed on a chemical classified as hazardous for the environment:

(1) The manufacturer, technical use, storage and handling of chemicals hazardous for the environment would, depending on the character and volume of the activity require:

(A) notification to or a permit issued by the District Office of the Technical Inspectorate;

(B) in the case of larger installations a permit from the Technical Inspectorate;

(2) Material Safety Data Sheet should be compiled for chemicals hazardous for the environment. The sheet ought to contain precise data on the hazardousness of the chemical or its components for the environment (e.g. LC_{50}-values, data on degradation, etc.).

(3) The act would include authorization to prescribe by decree the labelling of chemicals hazardous for the environment as part of the labelling system for hazardous chemicals.

In the advance control of new chemical substances the notification of chemicals would include also data on the hazardousness of the chemical to the environment and a proposal for classification of the chemical (see introduction). The classification of the chemical as it relates to the hazardousness for the environment would be controlled by the National Board of Waters and Environment.

1.3 DISCUSSIONS (SESSION 1)

A few questions on testing of substances and their categorization were answered by the speaker.

Mr. Bengtsson explained that usually the toxicity tests are forwarded together with the substance and by the use of references it is not difficult to rate the substance, if the right animals and environment are used in the tests. However, where doubts arise, the members of the GESAMP Working Group carry out simple tests in their home countries to verify the accuracy of the data presented. Sometimes the confidence level is so low that new tests are required. Lub oil additives were typical of this last type.

He also stressed on the terms of reference of the GESAMP Working Group on hazard evaluation who were only interested in the environmental hazards from the scientific point of view. He confirmed that old data with low confidence could make their task from even a scientific point of view difficult, but confirmed that GESAMP would not overrate toxicity of a substance by guess-work but, at the same time would not hesitate to give a higher rating if they could find a little support for doing so.

One delegate failed to understand the criteria used for ship type allocation e.g. a type III ship was allocated to a category A while a type II ship to a category C cargo. Another delegate raised a point on the relevance of using IMO:s categorization in case of concentrated discharges in shallow and enclosed waters as a result of accidents. The speaker could not answer these two questions as it was beyond the terms of reference of his group.

There was only one question put to Mr. Nikunen. Mr. Hildén asked if there was any relationship between the GESAMP work and the Finnish proposal on classification of chemicals hazardous for the environment. Mr. Nikunen replied by stating that the classification would not be applied to transport of chemicals in ships.

SECTION B.

SESSION 2: CHEMICALS IN THE BALTIC SEA

2.1 Sea transport of chemicals - A threat to the environment?

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2.2 Transportation pattern for chemicals carried on the Baltic Sea.

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2.3 Discussions on Session 2.

2,1 SEA TRANSPORT OF CHEMICALS - A THREAT TO THE ENVIRONMENT?

1. INTRODUCTION

Already in a government study published 1979, the lack of knowledge about sea transports of chemicals was emphasized (SOU 1979:45). At that time, there was no authority responsible for keeping records of the transport situation, i.e. nobody knew what quantities of dangerous goods were shipped along the coast of Sweden or what routes these transport followed. In other words, nobody knew what kind of scenarios to expect if a spill involving hazardous chemicals would occur.

In 1984, when the present study was initiated, this situation prevailed. The knowledge of quantities and characteristics of chemicals transported at sea was still poor, thus hindering optimized contingency planning. Furthermore, very little was known about the environmental aspects on chemical spills.

Thus, the main objectives of this work were to make an inventory of sea-borne transport patterns, classify the chemicals according to their threat to aquatic life, study their behaviour in the sea, and thus come up with a list of chemicals posing a major environmental risk, and discuss what combat measures are available to mitigate their impact.

2. TRANSPORT PATTERNS

The background data for this work represent import and export statistics for 1983 in Sweden. Thus, it does not include domestic transports, or shipments passing the Swedish coast on their way to neighbouring countries.

According to Lindgren and Stenström (1986), the amounts passing but not entering Sweden may exceed those destinated in or out of the country by as much as 50% along the southern coastline.

The amount of dangerous goods going into or out Sweden in 1983, totalled some 3.7 million tons. Of this amount about 30%, or 1 million tons, can be considered a risk to aquatic life (see classification system below). Furthermore, a majority of these "risk chemicals" are transported along the west and south coast of Sweden (Fig. 1).

3. CLASSIFICATION OF CHEMICALS

GESAMP's hazard profiles have served as a basis for IMO in their classification of chemicals. These profiles take into account bioaccumulation and tainting, risk for living organisms, acute toxicity to mammals (risk for humans), and risk for recreational and aesthetical assets. In other words, many other aspects than the risk posed on aquatic life are weighed in the classification.

After identification of the chemicals involved in transports to and from Sweden, it became clear that all of them were not present in the IMO list. After examination of their characteristics, it also became clear that some of the IMO listed substances had been given their classification because of the risk for other assets than marine life according to the hazard profiles mentioned above.

Therefore, the need for a classification based on the risks for the marine environment taking also into account the special conditions for the Baltic, was obvious.

Using the IMO lists, other toxic substances lists, various handbooks (Sax, Verschueren and others), and our own knowledge of previous investigations, a "Swedish" classification system was designed, taking into account only the environmental aspects.

Thus, a "risk list" was set up, classifying the substances in three categories; α, β, and γ, α being the most dangerous to aquatic life'. Of the hundreds of chemicals transported in 1983, around 40 were selected in the risk list (Table 1). The Y-chemicals were given a place in the list mainly due to their large quantities, whereas also small amounts of a-chemicals were included. From the table it is obvious how coarsely the transport statistics devide the chemicals. Many of the groups included tons of chemicals of widely different (biological) characteristics. In many cases it is not even possible to penetrate the group description deep enough to reveal which substances are included. Therefore, the classification is based on the most dangerous properties of the substances possible to identify within a group.

4. RISK ANALYSIS

The threat to the environment in connection with spills of chemicals at sea, can be devided into (at least) the following questions:

* The probability of spills happening
  - spill statistics
  - transport volumes
  - transport routes
  - way of transportation

* The probability of spills happening in a specific area.
* The probability of environmental effects.
* The possibilites of succesful combat.

All of which are interrelated.

Spill statistics from the National Swedish Administration of Shipping and Navigation (Sjöfartsverket) show that 176*) accidents involving transports of dangerous goods happened annually during the period 1976 to 1982 in Swedish waters. On 15% of these occasions, chemicals were spilled into the sea. The risk of spillage was found biggest in connection with collisions and groundings, which account for 70% of all accidents. The probability of such accidents is estimated at 0.8 to 1.2 x 10^3 per-journey (Lingren and Stenström, 1986). According to the same authors, the risk of accidents varies on route:

	Grounding (54% of all accidents 1976-1982)	Collision (28% of all accidents 1976-1982)
Harbour inlets	33%	25%
Sounds and passages	50%	34%
Open sea	17%	41%

The risk of spills is also dependent on the type of vessel carrying the chemical (bulk transports) or the package material. Lindgren and Stenström have estimated the following theoretical quantities released in a "mean accident":

	Vessel Type III	Vessel Type II
Grounding	q/10	q/160
Collision	q/64	q/340

where q = volume of ruptured tank.

*) This includes accidents involving tankers and non-tankers.

When evaluating the risk of environmental effects, further aspects have to be considered. The spill site will be decisive for the environmental impact, the time of the year is another factor of importance. The most influential parameter is the chemical itself, however, Its behaviour in the sea, its persistance along with its ecotoxicological properties, will dimension its threat to the environment.

Therefore, an environmental risk analysis must include not only classification of chemicals, but also a description of their behaviour in the seawater. This was done introducing the following characteristics:

O: the substance evaporates
I: the substance sinks
II: the substance floats
III: the substance is relatively persistent
IV: the substance is relatively biodegradable.

These characteristics were combined with the solubility potential, giving a matrix:

I	II	III	IV	
				Insoluble
				Soluble
				Soluble momenta-neously

The ranked chemicals were then placed in the matrix giving a multi-faceted description of the fate of the "risk substances" according to Table 2.

5. RESPONSE

All successful response actions are dependent on good contingency planning. When a spill of chemicals happens and the immediate risk for human life is warded off, environmental concern will be the major factor directing combat strategies. Therefore; a fate matrix like the one described above is extremely valuable.

Because of the large number of chemicals transported at sea, their varying physio-chemical and biological properties as well as their varying behaviour once they have been released, it is impossible to prepare oneself for all possible situations that might occur. Contingency planning, combat and recovery techniques have to be optimized using risk analyses, i.e. evaluations of both geographical and quantitative risks using knowledge of the fate of the chemicals spilled.

6. CONCLUSIONS

Our possibilities of successfully combatting chemical spills are poor today. Chemicals which behave like petroleum oils can be recovered (provided ambient weather conditions and their human toxicity permit it), whereas techniques for recovery or neutralization of other substances are theoretical or non-existent. Therefore, improvements in today's situation are urgently needed.

Our knowledge of sea transport of chemicals in the Baltic has to be improved, thus giving a basis for reliable risk evaluations. Transport patterns should be investigated in detail and on the regional level.

Our knowledge of the behaviour of chemicals in Baltic Sea conditions has to be increased, giving better descriptions of the fate of these substances.

Our knowledge of the environmental effects of chemical spills has to be improved in order to obtain better descriptions of the fate of chemicals in the Baltic Sea.

The threat that spills of chemicals pose on the Baltic, makes these questions common for all countries surrounding it. Only by an increased knowledge in the areas listed above, will it be possible to optimize contingency planning and response routines. Therefore, it is hoped that other Baltic countries will do their own transport inventories and that investigations on the fate of chemicals in the Baltic Sea can be carried out together.

This paper is based on a report called "Ett skepp kommer lastat - Kemikalietransporter och miljörisker" (Lehtinen and Martin, 1986).

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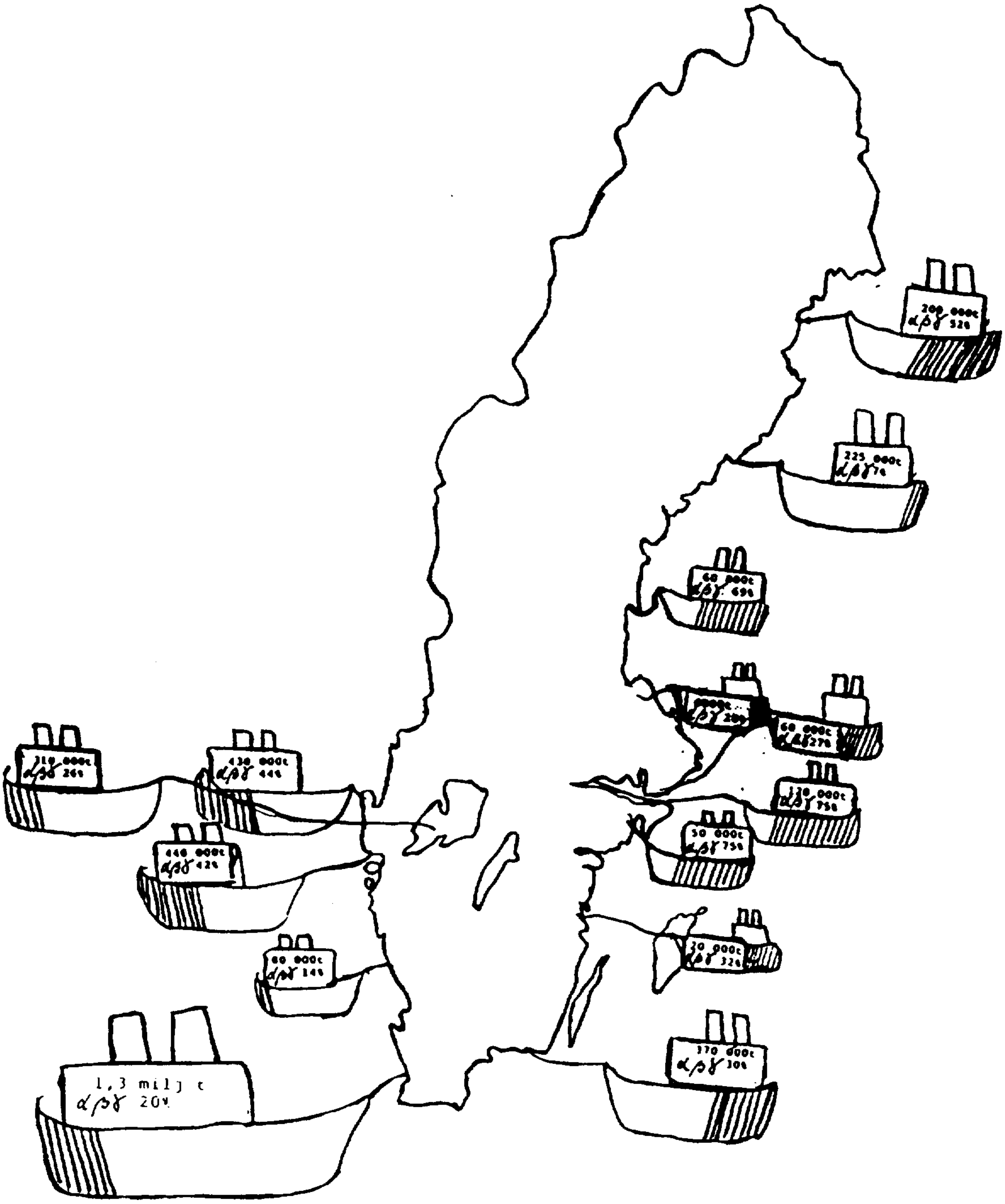

Fig. 1. Total import and export in 1983 to different harbour areas in Sweden. The market parts indicate the proportion of α, β, and γ-chemicals.

Table 1. "Risk list" for transported chemicals.

α	
Pine oil*	57 000 tons
Hydroxides and salts of heavy metals	25 000
Anti "knocking" agents*	25 000
Biocides, desinfectants	20 200
Chlorine	19 000
Carbondisulfide*	9 200
Cyanides	3 400
As-trioxide	1 400
Xantogenates	1 000
Naphtalene, antracene	140
Mercury	130
Acroleine (*) .... y% of	4 600
Total	162 000 tons
β	
Ammonia	209 000 tons
Styrenes *	43 000
EDC*	38 000
Other halogenated HC:s	32 000
Resin acids*	21 000
Cresols, phenols* and their salts	16 000
Kerosene*	11 500
Quaternary ammonium salts + hydroxides ...	7 000
Saponified resins*	3 400
Acrylnitrile*	2 000
Sodium sulphites*	2 000
Butyl- and crotonaldehydes .... x% of	4 600
Total	213 000 tons

- cont'd -

Table 1. (cont'd.)

Benzene*, toluene*, xylene* and other benzene oils*	227 000 tons
Kaustic soda*	186 000
Inorganic acids* (H_2SO_4, HNO_3, HF)	71 000
Other destillates	61 000
Conc. sulphite spent liquor	38 000
Creosote oils*	28 000
Additions to lubrication oils	21 000
Ferrous chlorides*	15 000
Amino compounds . . . ..*..........a.........	12 600
Mono- and diamines	11 000
Acet-, par-, and formaldehyde*	8 000
Isocyanates	6 000
Hydrogen peroxide*	3 000
Total	650 000 tons

* The classification corresponds to IMO's A-, B-, and C-groups.

Table 2

I:5 (Substance sinks, poor biodegradation, insoluble in water) Anti "knocking" agents α Mercury α			IV:5 (Substance floats, poor biodegradation, insoluble in water) Mono- and diamines γ
I:6 (Substance sinks, poor biodegradation, soluble in water) Hydroxides and salts of heavy metals α Biocides, desinfectants α As-trioxide α Antracene α EDC β Resin acids β Saponified resins β Halogenated HC:s β Ferrous chlorides γ Creosote oils γ Conc sulphite spent liquoc γ Carbon disulfide γ Sodium sulphites β	I:6 (Substance sinks, is biodegradated, soluble in water) Crescles, phenols β Quaternary ammonium salts β Amino compounds γ	III:6 (Substance floats, poor biodegradation, soluble in water) Accoleine α Naphtalene α Pine oil A	IV:6 (Substance floats, biodegradable, soluble in water; Styrenes β Acrylnitrile β Kerosene β Butyl- and crotonaldehydes β Benzene, toluene, xylene γ Other distillates γ
I:7 (Substance sinks, poor biodegradation, momentaneously soluble) Chlorine α Cyanides α NaOH, KOH γ Inorganic acids γ	I:7 (Substance sinks, is biodegcadated, momentaneously soluble) Xantogenates α Ammonium β Isocyanates γ Hydrogen peroxide γ		V:7 (Substance floats, is biodegradated, momentaneously soluble) Formaldehyde γ Paradehyde γ Acetadehyde γ

2.2 TRANSPORTATION PATTERN FOR CHEMICALS CARRIED ON THE BALTIC SEA

1. TRANSPORTATION PATTERN

The volume of chemicals handled in Swedish ports and their transportation pattern have been analyzed based on a questionnaire filled out by all Swedish ports for the period October - December 1985.

The total amount of chemical identified in the survey is about 500,000 tons for the three months period divided on approximately 260 shipments. Tables 1 and 2 illustrate the quantities and number of shipments divided in the MARPOL categories A, B, C and D and "O" (identified harmless chemicals). As the pre-winter traffic is assumed to be heavier than average, the annual quantities transported may be taken as three times the quantities reported for the sample period.

The quantities reported by each port have been identified, as far as practicable, to the origin or destination and the transportation pattern has been added up along the coast. Table 3 illustrates the chemicals carried during the period of the survey, divided on six coastal segments. Figures l-4 illustrate the transportation pattern thus obtained, indicating quantities on an annual basis as extrapolated from the three months survey.

2. ACCIDENT RATE

The accident rate is estimated from various sources, including statistics from the Swedish Administration of Shipping and Navigation, studies on ship casualties in the Baltic Sea by Professor Kostilainen and other published data. The main accident is, in case of Swedish waters, groundings, accounting for 47%, followed by collisions, accounting for 28%. The accident rate per voyage in the Baltic Sea is shown in Professor Kostilainen's study from the period 1960-69 to be $3.9 \cdot 10^{-3}$ which, by applying the above percentage figures, may be assumed to include $1.8 \cdot 10^{-3}$ groundings and $1.1 \cdot 10^{-3}$ collisions. The total number of reported groundings in Finnish waters in relation to number of port visits show a grounding rate of $0.7 \cdot 10^{-3}$. The total number of reported groundings and collisions in the Baltic Sea may be put in relation to the total number of ship visits into the Baltic Sea, extrapolated from Kiel Canal figures. This indicates an accident rate of about $1.10 \cdot 10^{-3}$ each for both groundings and collisions. Considering these figures and the fact that the statistical accident rate is somewhat higher for tankers than for other vessels and also the fact that accident rates have gone down since the 1960-69 period the following accident rates have been considered appropriate, related to number of visits to Swedish ports

grounding rate	$1.2 \cdot 10^{-3}$
collision rate	$0.8 \cdot 10^{-3}$

Not all of the groundings and collisions cause outflow of cargo. The available information in this regard is not very extensive. The statistics of all accidents related to all ships as reported by the Swedish administration indicates that leakage has developed in 30% of the groundings. For collisions 33% of the accidents are reported to involve leakage or other substantial damage (e.g. outflow of cargo from rupture above the water line if the vessel were a tanker). It is therefore generally assumed that 30-33% of the accidents result in outflow of cargo. The accident rates which result in outflow of cargo may then be estimated to be

grounding rate $0.4 \cdot 10^{-3}$
collision rate $0.3 \cdot 10^{-3}$

The risk associated with total losses is according to Swedish statistics about 1.4% of the overall accident rate. This may be converted to a risk factor of about $4 \cdot 10^{-5}$ per voyage.

3. OUTFLOW IN CASE OF AN ACCIDENT

The outflow in case of a grounding or collision depends on the extent of the damage, the type of tank enclosure, the loading conditions of the vessel and the properties of the cargo.

The extent of damage has been taken from Professor Kostilainen's study of the 1960-69 accidents which give the average length and penetration of grounding and collision damages. These values applied to the average tanker involved in the traffic indicate that in a type III ship 2.7 tanks will be ruptured *in* case of the average grounding and 0.7 tanks in case of a collision. In a type II ship 0.33 tanks will be ruptured in case of a grounding and 0.14 in case of a collision.

The amount of outflow will depend on the hydrostatic overpressure of the cargo at the location of the breach of the tank enclosure. In case of a fully loaded tanker this overpressure will be about 1 metre of liquid column in case of a bottom damage. The hydrostatic overpressure has been arbitrarily increased by 1 metre due to the vessel being only part loaded and a further 1 metre as a result of "pumping" due to swells. The depth of the cargo tank in the average tanker in this study is about 8 metres and hence 3/8 of the cargo will escape in case of a cargo lighter than water. In case of a cargo heavier than water or highly soluble in water the entire quantity will escape. In case of double bottom the cargo will be located about 1 metre higher relative to the sea level and the hydrostatic overpressure will increase by about 1 metre. In case of a breach of the inner bottom of a type II tank 4/8 of the tank content will escape when the cargo is lighter than water.

The fact that vessels mostly operate in part load condition and that the degree of part loading has not been known is a considerable source of uncertainty. Calculations show however that the hypothetical outflow from a given parcel of cargo is not so different if the parcel is carried in a small tanker where it occupies a large portion of the ship's tanks or in a bigger ship where it only occupies a fraction of the tank capacity.

Similar considerations of the situation in case of a collision show that in 80% of the cases the damage is likely to be limited to the tank side above the sea level and only the corresponding portion of the cargo will escape. In the remaining cases water will enter the tank and displace the entire quantity except if the cargo is heavier than water and not soluble. These calculations lead to fractions of the transported cargo parcel, q, that will escape in case of the average accident (being severe enough to cause outflow) as follows:

	cargo with density less than 1	cargo with density above 1 or highly soluble
Type III ship (or tank)		
Grounding	q/20	q/8
Collision	q/60	q/68
Type II ship (or tank)		
Grounding	q/260	q/130
Collision	q/320	q/370

4. RISK ASSESSMENT

These factors may be applied, together with the rate if accident involving outflow, to any part of the transportation pattern. In this study the hypothetical outflow factors were first applied to the shipment of each cargo handled in each'coastal sector. A hypothetical outflow or "significant spill" quantity was obtained for each substance by calculation of the average size of the parcel and application of the outflow factor. In doing so the cargoes have been assumed to be carried in ships meeting the minimum ship type requirements except for one cat. B substance which is carried exclusively in domestic trade in one vessel, being of type II despite the substance would be allowed to be carried in a type III ship. The "significant spill" was derived by applying the outflow factors for groundings which represent the more severe case.

The "significant spill" quantity thus computed would represent outflow in case of an average grounding accident and could be used for assessment of the relative pollution hazard along different coastal segments. The outflow hazards were subsequently also added to other coastal segments along which the transportation actually takes place. No adjustment was made due to the fact that the risk is in fact higher at the port entry end of the voyage than during the transiting phase along the coast.

A further attempt was made to compare the hazards from transportation of chemicals of different categories by applying the hazard factors of 1000 for cat. A, 100 for cat. B, 10 for cat. C and 1 for cat. D (the same factors as used in BCH guidelines for categorization of mixtures). The total hazard factor composed of, for each substance, the significant spill multiplied by number of occasions and by the category factor was used to identify the prime risk substances.

The risk for accidents resulting in outflow of cargo was not applied to these individual substances. The annual risk for a severe accident with a chemical tanker was rather calculated by applying the grounding and collision rates to the total number of voyages to Swedish ports. This number of probable accidents, 0.5 per year, can be further distributed along the coastal segments, based on the actual number of ship movements (port visits plus transiting ships).

As the total hazard along any segment of the coast cannot be described by a single number the hazard has been illustrated as represented by the substances having the highest hazard factor as calculated above, the largest significant spill quantities, the largest individual parcel of cargo and the largest number of shipments.
A summary of these factors, including the substances which according to these criteria represent the highest risk along each of the coastal segments is shown in the table below:

Antal transporter, kategorivis:

	A	B	C	D	0	SUMMA
Bottenviken:	3	1	4	5	-	13
Bottenhavet:	8	4	5	11	4	32
Ostkusten:	1	9	6	17	14	47
Sydkusten:	1	5	-	42	-	46
Öresund:	-	9	13	19	8	49
Västkusten:	1	27	8	21	18	75
Summa:	14	55	36	115	44	264

Table 1. Number of shipments per category and coastal segment. (Note: all figures refer to 3 months period Oct-Dec 1985).

Transporterade volymer, kategorivis:

	A	B	C	D	0	SUMMA
Bottenv.:	2718	548	34665	19630	-	57561
Bottenh.:	11794	1030	9535	34277	6540	72281
Ostkust.:	414	9059	3120	17635	18178	50884
Sydkust.:	402	10796	-	43325	-	54523
Öresund.:	-	5071	44417	45578	22412	121850
Västkust.:	1119	63138	9296	64560	31637	155740
Summa:	16447	89642	101033	225005	78767	

Table 2. Quantities per category and coastal segments. (Note: all figures refer to 3 months period Oct-Dec 1985).

SAMMANFATTNING AV KEMIKALIETRANSPORTER								
			Quantity, Metric tons			Number of ships		
			Loaded	Unloaded	Total	Loading	Unloading	Total
	TOTAL SUMMA		191103	312576'	503679	81	180'	261
VÄSTKUSTEN								
Rapportperiod: Okt 1 - Dec 31, 1985								
UN-No	Substance	Marpol	Quantity, Metric tons			Number of Shipments		
		Cat.	Loaded	Unloaded	Total	Loading	Unloading	Total
1824	Sodium hydroxide	D	42497	3519	46016	7	2	9
	Steam cracked naphte	B?	29349		29349	12		12
	Light cat cracked spirit	B?		16005	16005		4,	4
	Diethylhexyl alcohol		10302		10302	11		11
1129	n-Butyraldehyde	B	9160		9160	3		3'
2398	Methyl tert-butyl ether	D		8555	8555		6	6
1230	Methanol	O		5850	5850		2	2
1307	Xylene	C		5182	5182		4	4
	Dioctyl phtalate	O	5011		5011	8		8
1300	Solvents (white spirit)	(B)		2750	2750		5'	5
2362	Dichloroethane	B	2672		2672	2		2
	Coal tar oil	(B)	1968		1968	1		1
2312	Phenol	B		1635	1635		3	3
1063	Monoethyl amine	C	13461		1346	2		2
1299	Turpentine	B	1152		1152	1		1
1131	Carbon disulphide	A		1119	1119		1	1
12941	Toluene	C		1100	1100		2	2
	Sodium hydrox. spent		1018		1018	1		1
	Diisodecyl phtalate	D		926'	926		1	1
20571	Nonene	B		750	750		2	2
	Diisooctyl phtalate	O	450	299	749	1	1	2,
	Ethylene glycol	D		627	627'		2'	2
1219	Isopropyl alcohol	O		475	475:		1	1
1170	Ethanol	O		450	450		[illegible]	1
1604	Ethylene diamine	C	350		350	1		1
1090	Acetone	O		300	300		1	1
1193	Methyl ethyl ketone	D		250	250		2	2
	Diethanol amine	O	103		103	1		1
	Correction for combined shipments!					-10	-7	-17
			Quantity, Metric tons			Number of Ships		
			Loaded	Unloaded	Total	Loading	Unloading	Total
	SUMMA		105378	50362	155740	41	34	75

Table 3. Chemicals shipped per coastal segment.
(3 pages)

ÖRESUND								
Rapportperiod. Okt 1-Dec 31, 1985								
UN-No	Substance	Marpol	Quantity, Metric tons			Number of Shipments		
		Cat.	Loaded	Unloaded	Total	Loading	Unloading	Total
1830	Sulphuric acid	C		40336	40336		4	4
1805	Phosphoric acid	D	22954	4234	27188	5	1	6
1230	Methanol	O		20012	20012		7	7
1824	Sodium hydroxide	D		11984	11964		5	5
	Fluosilicic acid			74651	7465		4	4
1301	Vinyl acetate	C		2946	2946		3	3
2312	Phenol	B		2720	2720		5	5
	Vegetable oils	D		2386	2386		4	4
1300	Solvents (white spirit)	B?		1775	1775		3	3?
1090	Acetone	O		1450	1450		1	1
2348	Butyl acrylate	D		1140	1140		1	1
1173	Ethyl acetate	D		632	632		1	1
1256	Solvent naphta	B?	5761		576	II		1
	Ethylene glycol	D		482	482		1	1
1123	Butyl acetate	C		353	353		1	1
1188	Ethylene glyc methyl eth	D		325.	325		1	1
1307	Xylene	C		300	300		1	1
	SUMMA		23350	98500	121850	6	43	49

SYDKUSTEN								
Rapportperiod: Okt 1-Dec 31, 1985								
UN-No	Substance	Marpol	Quantity, Metric tons			Number of Shipments		
		Cat.	Loaded	Unloaded	Total	Loading	Unloading	Total
	Vegetable oils	D	5735	27589	33324	10	29	35
2055	Styrene monomer	B		107961	10796		5	5
1824	Sodium hydroxide	D		8403	8403		2	2
	Cod liver oil	D		1598	1598		1	1
	Butyl benzyl phtalate	A		402	402		1	1
	SUMMA		5735	48788	54523	10	38	48

Table 3. Chemicals shipped per coastal segment (3 pages)

OSTKUSTEN, STOCKHOLM OCH SODCR DÅROM								
Rapportperiod Okt 1-Dec 31, 1985								
UN-No	Substance	Marpol	Quantity, Metric ton:			Number of Shipments		
		Cat.	Loaded	Unloaded	Tots!	Loading	Unloading	Total
1824	Sodium hydroxide	D		9178,	9178		3.	3
1170	Ethanol	O		8018	8018		13	13
1805	Phosphoric acid	D		7801	7801		2	2
	Coal tar oil	(E)	5526		5526	2		2
	Styrene monomer	B		4690	4690		4	4
	Latex	D	3142		3142	6		6
1300	Solvents (white spirit)	(E)		2864	2864		5	5
1300	Ethylene glycol	D		1725	1725		3	3
1090	White spirit	E		1505	1505		3	3
1114	Acetone	O		1260	1260		4	4
1219	Benzene	C	992		992	1		1
1294	Isopropyl alcohol	O		805	805		2	2
1307	Toluene	C		743	743		3	3
1123	Xylene	C		736	736		2	2
1334	Butyl acetate	C		649	649		2	2
	Creosote (coal)	(A)		414	414		1	1
1173	Propylene glycol	O		304	304		1	1
1193	Ethyl acetate	D		300	300		1	1
2055	Methyl ethyl ketone	D		232	232		2	2
	Correction for combined shipments			412241		9	13	13
	SUMMA		9660		50884		38	47

BOTTENHAVET								
Rapportperiod: Okt 1 -Dec 31, 1985								
UN-No	Substance	Marpol	Quantity, Metric tons			Number of Shipments		
		Cat.	Loaded	Unloaded	Total	Loading	Unloading	Total
1824	Sodium hydroxide	D		31378	31378		8	8
	Tall oil, crude	A	2919	7822	10741	2	5	7
1129	n-Butyraldehyde	B		9160	9160		3	3
	Tall oil fatty acid	C	5100	2898	79981	4	3	7
1830	Sulphuric acid	C		4435	4435		1	1
1170	Ethanol	O		3690	3690		3	3
1230	Methanol	O		2850.	2850		1	1
1299	Turpentine	B	1030		1030	1		1
1334	Creosote (coal)	(A)		995	999		1	1
	SUMMA		9049	63232	72281	7	25	32

BOTTENVIKEN								
Rapportperiod: Okt 1-Dec 31, 1985								
UN-No	Substance	Marpol	Quantity, Metric tons			Number of Shipments		
		Cat.	Loaded	Unloaded	Total	Loading	Unloading	Total
1830	Sulphuric acid	C	34665		34665	4		4
1824	Sodium hydroxide	D		19630	19630		5	5
	Tall oil, crude	A	2718		2718	3		3
1299	Turpentine	B	548		548	1		1
	SUMMA		37931	19630	57561	8	5	13

Table 3. Chemicals shipped per coastal segment (3 pages)

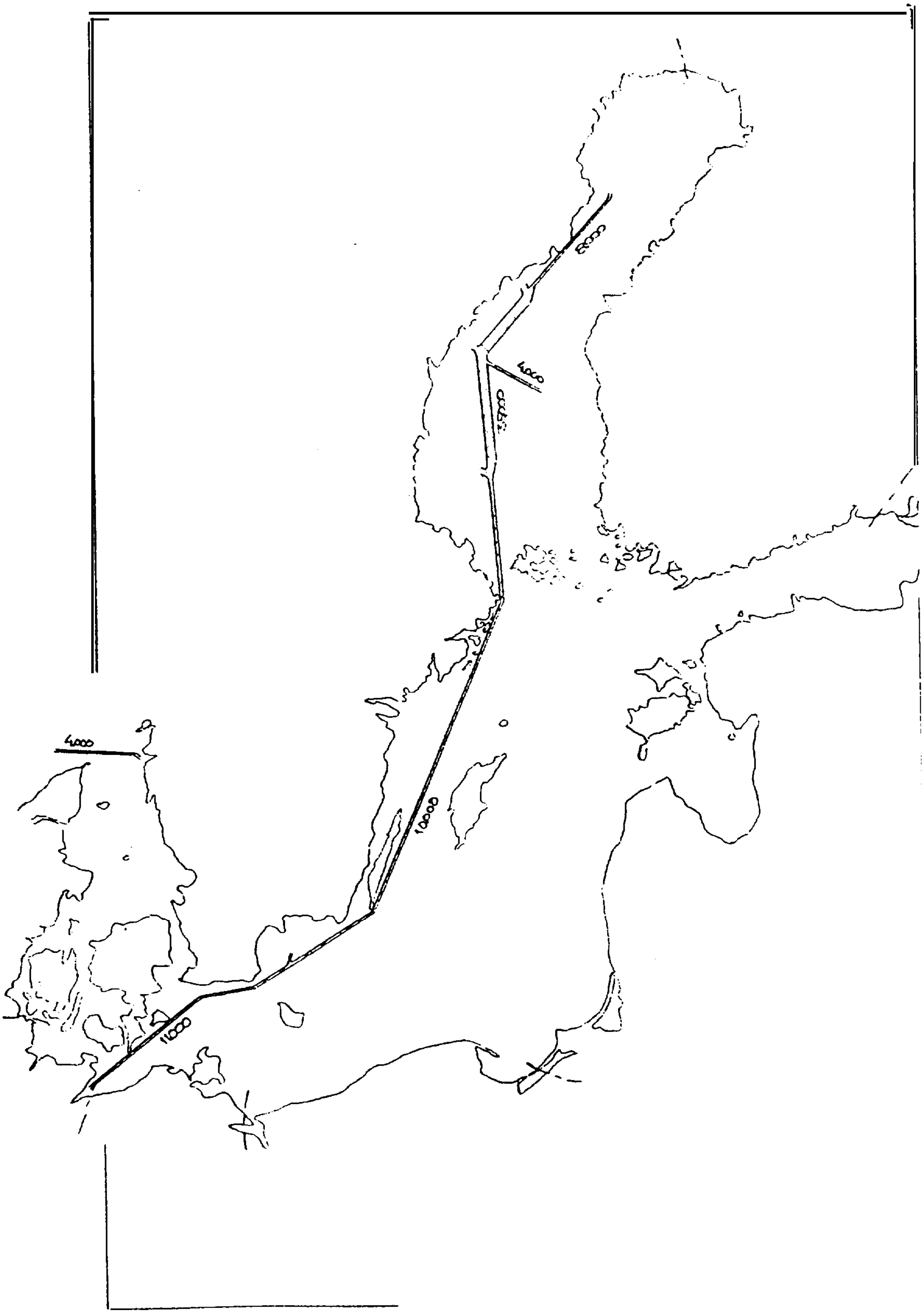

Fig. 1. Transportation pattern for category A substances to and from Swedish ports (figures indicate tons per year based on Oct-Dec 1985 statistics).

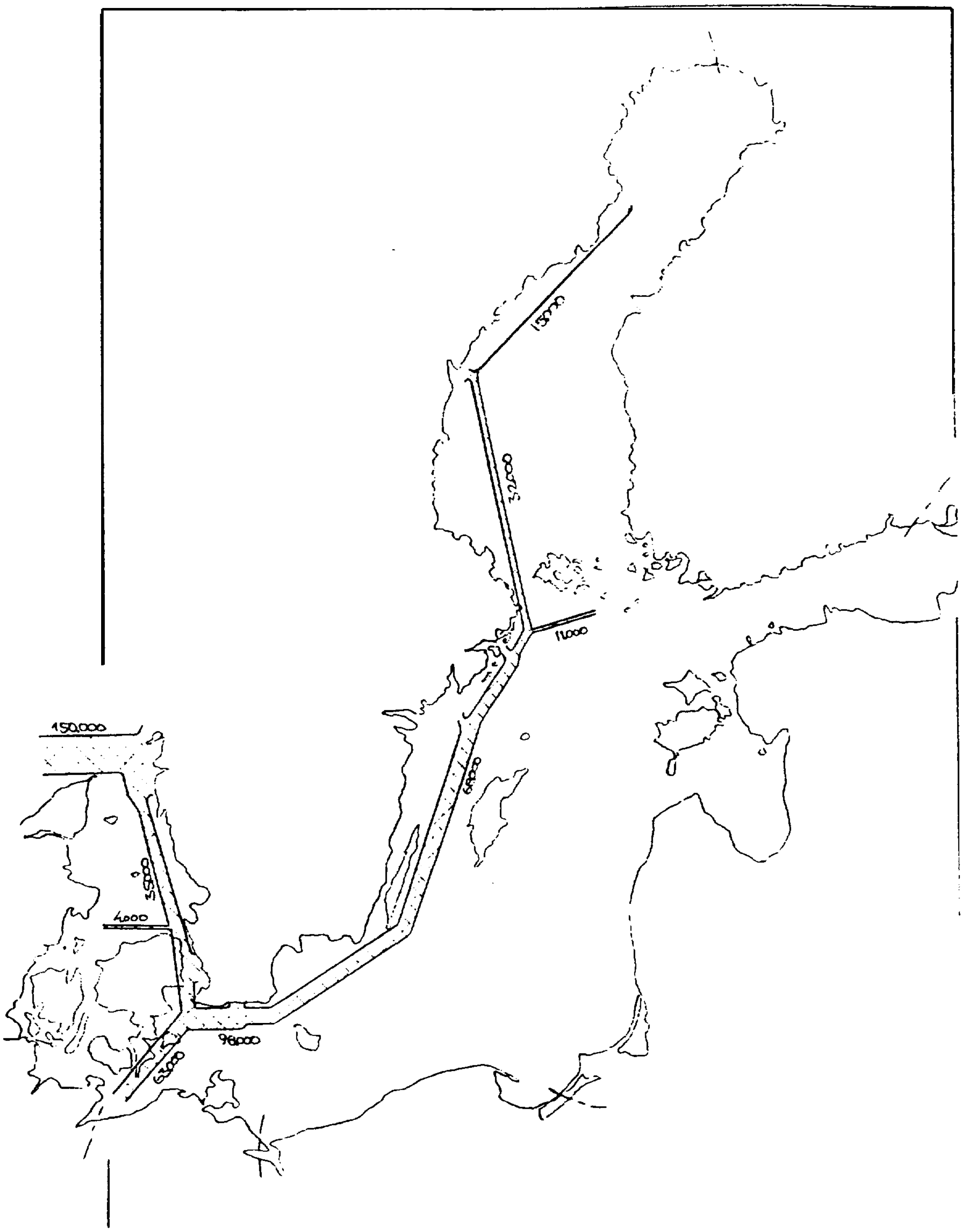

Fig. 2. Transportation pattern for category B substances to and from Swedish ports (figures indicate tons per year based on Oct-Dec 1985 statistics).

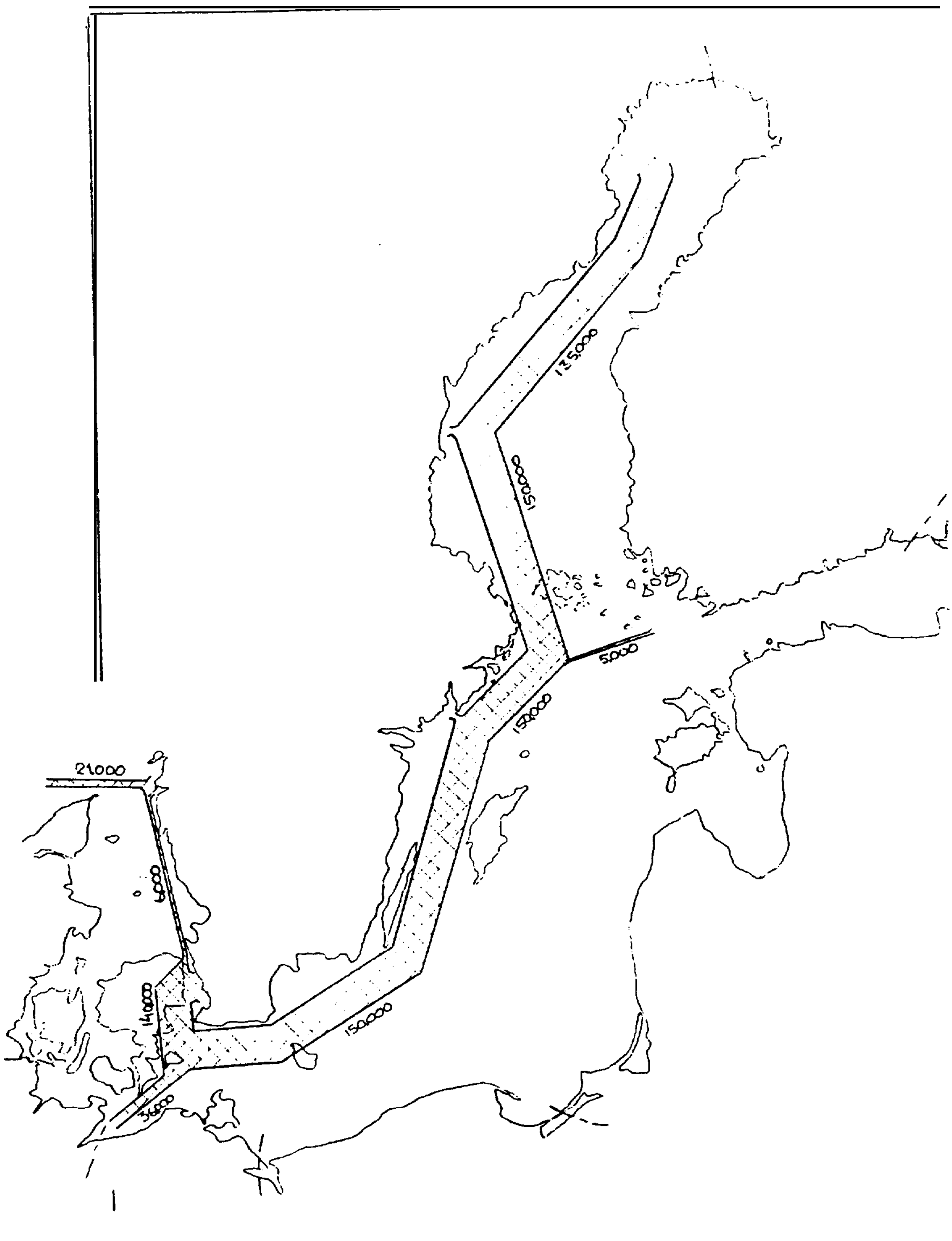

Fig. 3. Transportation pattern for category C substances to and from Swedish ports (figures indicate tons per year based on Oct-Dec 1985 statistics).

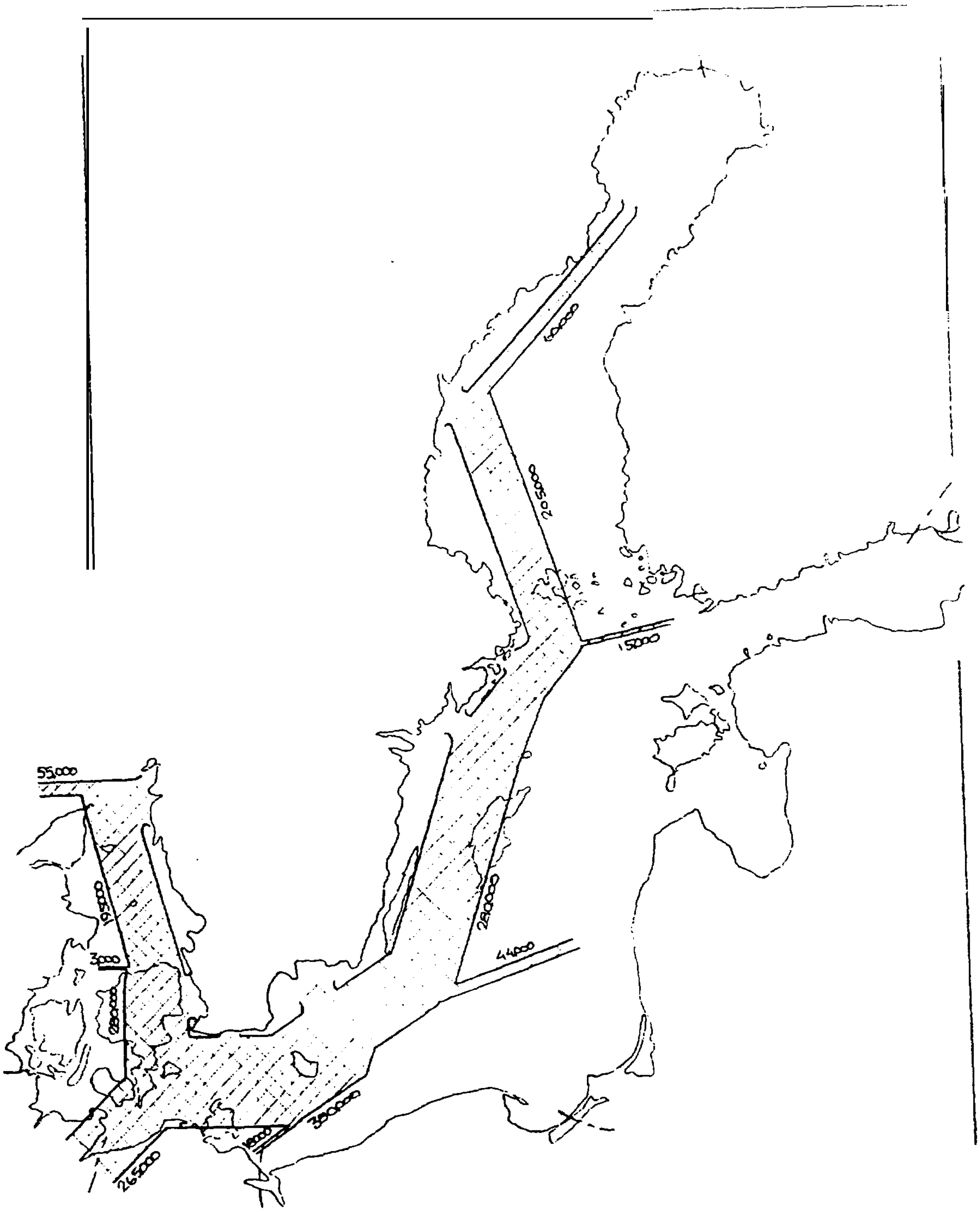

Fig. 4. Transportation pattern for category D substances to and from Swedish ports (figures indicate tons per year based on Oct-Dec 1985 statistics).

oastal egment	tatistical umber of ccidents per ear with out-low of hemicals	Highes Substance (biggest individual parcel in parenthesis)	azard fac significan spill	r Properties i water	Highest number of shfpments	Largest quantity moved (largest individual shipment in parenthesis)
est Coast	0,10	dicloroethane (1400) steam cracked naphta (3000)	.70 10	sinks floats	steam cracke naphta sodium hydroxide	sodium hydroxide (8000) steam cracked naphta (3000) light cat. cracked spirit (10000)
resund the Sound)	0,09	sulphuric acid (10000) sodium hydroxide (8000)	1200 500	mixes mixes	sodium hydroxide phenol	sodium hydroxide (8000) sulphuric acid (10000) phosphoric acid (6000)
South Coast	0.13	tall oil (900) styrene (3000) sulphuric acid (10000) tar oil (3000)	50 90 1200 140	floats floats mixes sinks	veg. oil sodium hydroxide styrene	sodium hydroxide (8000) veg. oil (2000) phosphoric acid (6000)
ast Coast	0,09	tall oil (900) sulphuric acid (10000) tar oil (3000) styrene (120 creosote (1000	50 1200 140 60 5	floats mixes sinks floats sinks	veg. oil sodium hydroxide tall oil fatty acid	sodium hydroxide (8000) sulphuric acid (100001 veg. oil (1000)
ulf of othnia	0.05	tall oil (1700 sulphuric acid (10000) creosote (1000	70 1200 10	floats mixes sinks	sodium hydroxide tall oil sulphuric acid	sodium hydroxide(8000) sulphuric acid (10000) tall oil (1000)

List of substances representing the highest combined risk factor as transported along the Swedish coasts.

2.3 DISCUSSIONS (SESSION 2)

The main disucssion was centred around the approach in assigning ship type to different categories. For example some categories A and B cargoes were allowed to be carried in type III ships while a category C cargo was required to be carried in a type II ship. The Chemical Codes require type I ship for products with severe environmental hazards and MARPOL assigns category A to substances presenting a major hazard to the environment. The present rationale could not be considered logical if it was the marine environment we were protecting.

There was a general agreement that the IMO categorization and containment rationale cannot be used for planning contingencies involving spills of noxious liquid substances in sensitive marine environment as that of the Baltic Sea.

SECTION C

SESSION 3: OIL-LIKE SUBSTANCES

3.1 Measurement of oil-like substances by oil content meters.

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FINLAND

and

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HELSINKI
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3.2 Discussion on Session 3.

3.1 MEASUREMENT OF OIL-LIKE SUBSTANCES BY OIL CONTENT METERS

Noxious liquid substances designated in Annex II of the MARPOL 73/78 convention as falling under Category C or D and identified as oil-like substances may be carried in an oil tanker.

One criterion is, that the ship is equipped with an oil content meter approved by the Administration for use in monitoring the oil-like substances to be carried.

No approval procedure or test-specification for this kind of meters has however been specified by IMO. Nor is there any laboratory standard specified to measure those oil-like substances carried.

OIL-LIKE SUBSTANCES

There are 16 groups of oil-like substances of Category C, classed as slightly toxic and listed in Regulation 14 of Annex II. The corresponding number of Category D non-toxic substances in 9 groups /1/.

The greater proportion of the oil-like substances are aromates or olefines, that is substances derived from crude oils, which differ radically from the oils and products defined in Annex I of MARPOL 73/78.

As a result these oil-like substances will not be registered by oil content meters specified in the IMO Resolution A.586 (14). Nor can these Substances be measured by the IMO laboratory standard using IR-spectrophotometry at 2930 cm^{-1}.

SELECTION CRITERIA

The IMO-selection criteria for oil-like substances /2/ requires a solubility of less than 0.1% corresponding to a concentration of 1000 ppm of the substance. This figure is however some two decades greater than the sensitivity required for oil discharge monitoring according to MARPOL Annex 1.

As the meters installed on board the majority of tankers cannot measure dissolved matter, consequently no oil-like substances may be transported by the oil-tanker fleet.

It might also be noted, that restricting the oil-like substances to hydrocarbons, leaves out polar substances from the scope of this regulation.

CERTIFICATION

The demand that the oil-like substances has to be monitored by an oil content meter approved for the specific substances to be carried leaves the Administrations without much guidance. No such certification procedure is so far being written by the MEPC of IMO.

We therefore propose a working group **to be set up to** define test procedures for oil content meters to ensure compatibility with Annex II requirements.

ANALYTIC RESEARCH

To assess the laboratory measurment properties of oil-like substances, a representative set of these subtances was measured against three standards, used or proposed for oil measurement, all using the IR-absorption method:

The IMO standard: A.586(14) comprising:
Methylene CH2 at 2930 cm^{-1}

The Nordic Standard: Orig. SWE-SS 01 81 45
Methylene CH_2 at 2925 cm^{-1}
Methyl CH_3 at 2960 cm -1

The IS0 draft proposal Standard: TC 147/SC2/WG 15
Methylene CH_2 at 2930 cm -1
Methyl CH_3 at 2960 cm -1
Aromates CH at 3030 cm -1

As can be seen from the Table /3/, comprising the relative absorbancies of the measured oil-like substances, there was a spred of 0.11 to 3.80 of the absorbancies using the IMO-specified laboratory measuring method of Annex I. This gives a max/min ratio of the relative responses of 35, which would be unsatisfactory as a general measuring standard.

The same would be the case for the Nordic Standard, with a max/min ratio of 22.

With the IR-absorption method now proposed by the International Standardization Organization ISO, the max/min ratio of the relative responses is down to 3.8 which gives a reasonable correlation to the results obtained, considering the differing physical properties of the oil-like substances measured.

LABORATORY VERIFICATION

Our measurements of the oil-like substances seems to indicate, that the IR-absorption measurement method as proposed by the IS0 would be well adapted for laboratory measurements/verification of these substances. It should however be noted, that no method so far is specified by IMO for the oil-like substances.

We therefore propose a working group to specify a laboratory test method for the oil-like substances based on the IS0 draft standard proposal, using IR-absorption at three wavelengths.

APPENDIX 1

MARPOL 73/78 ANNEX II REGULATION 14

OIL-LIKE SUBSTANCES

CATEGORY C SUBSTANCES

Cyclohexane
p-Cymene
Diethyl benzene
Dipentene
Dodecyl benzene
Ethyl benzene
Heptene (mixed isomers)
l-Hexene
2-Methyl-1-Pentene
n-Pentane
Pentenes, all isomers
Phenylxylylethane
Propylene dimer
Tetrahydro naphtalene
Toluene
Xylene

CATEGORY D SUBSTANCES

Alkyl (C9-C17) benzene straight or branched
Butene oligomer
Diisopropyl naphthalene
Dodecane
Ethylcyclohexane
Isopentane
Nonane
Octane
n-Paraffins C10-C20

APPENDIX 2

MARPOL 73/78 ANNEX II REGULATION 14

OIL-LIKE SUBSTANCES

SELECTION CRITERIA

1. The substance's mass density (specific gravity) is less than 1.0 at 20°C;

2. The substance's solubility in seawater at 20°C is less than 0.1 per cent;

3. The substance is a hydrocarbon;

4. The substance can be monitored by an oil content meter required by Regulation 15 of Annex I of MARPOL 73/78;

5. In the case of Category C substances, ship type requirement, as specified by the Bulk Chemical or International Bulk Chemical Codes, is type 3; and

6. The substance is not regulated by the Bulk Chemical or International Bulk Chemical Codes for safety purposes as indicated in Chapters VI and 17 of these codes.

*In approving an oil discharge monitoring and control system for the purpose of this Regulation, the Administration ensure through tests that the system can monitor concentrations of each oil-like substance in conformity with the Recommendation on International Performance Specifications for Oily-Water Separating Equipment and Oil Content Meters adopted by the Organization by resolution A.393(X), as amended by

MEPC 24(22), Annex 2, or Revised Guidelines and Specifications for Oil Discharge Monitoring and Control Systems for Oil Tankers, Resolution A.586(14), as amended by Resolution MEPC 24(22), Annex 1.

...

APPENDIX 3

RELATIVE ABSORBANCIES OF OIL-LIKE SUBSTANCES

VTT - FINLAND

Measuring method	IMO	Nordic	ISO
Cyclohexane	3.80	2.30	1.10
Ethyl benzene	0.31	0.44	1.10
n-Pentane	2.00	2.70	1.90
Tetrahydro naphthalene	0.79	0.51	0.50
Toluene	0.11	0.12	1.00
Xylene nitration grade	0.21	0.25	0.75
Dodecane	1.80	1.56	0.90
Octane	1.70	1.70	1.10
Max/min ratio	35	22	3.8

3.2 DISCUSSIONS (SESSION 3)

From the discussions it could be concluded that the IMO Guidelines on testing of oil content meters could not be applied without certain classification for testing of oil-like chemicals. The most important aspect which had been left wide open to interpretation was the standard method of determining the amount of substance in the grab sample. For oil, the infrared absorption technique using a standard wavelength is specified in the Guidelines. Such a method was not specified in the present Guidelines for the oil-like chemicals.

Doubts were expressed regarding the ability of meters based on turbidity measurement principles to be able to detect oil-like substance; these being soluble in water up to hundreds of ppm. A very complex meter using more than one wavelength in the IR band could fulfil the need but its development in the absence of a detailed specification from IMO would be delayed.

SECTION D

SESSION 4: EXPERINCES GAINED FROM IMPLEMENTATION OF REGULATION 5 OF ANNEX IV OF THE HELSINKI CONVENTION

4.1 Impact of new regulations on new and existing ships and the need for reception facilities.

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Keilaniemi
SF-02150 ESPOO
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4.2 10 months after implementation of Regulation 5 - a success?

Mr. Jürgen Warnecke
Head of Chartering and Operations,
John T. Essberger
HAMBURG
FEDERAL REPUBLIC OF GERMANY

4.3 Ship's personnel's experiences in implementing some of the requirements of MARPOL 73/78 and Regulation 5 of Annex IV of the Helsinki Convention.

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Captain
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4.4 Practical experiences gained in the determination of cargo residue quantities on chemical tankers.

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Germansicher Lloyd
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FEDERAL REPUBLIC OF GERMANY

4.5 Discussions on Session 4.

4.1 IMPACT OF NEW REGULATIONS ON NEW AND EXISTING SHIPS AND THE NEED FOR RECEPTION FACILITIES

THE IMPACT OF NEW REGULATIONS ON EXISTING SHIPS

Existing ship, in this paper, is defined a bulk chemical carrier constructed before July, 1986.

Accordingly all bulk chemical ships in the market can be considered as existing ships.

Existing ships can be divided into three different categories:

Original chemical ship; a conventional tanker in specialized service.

The second generation of chemical tankers were developed due to the demands of more feasible and economical tankers, as well as due to the need to carry an increased number of high quality products in the 60's.
Accordingly tankers were converted by construction of multiple pumping and piping arrangements, cargo segregations, improved tank bulkhead coatings, etc.

The third generation of chemical tankers.
These tankers are built to satisfy the requirements of chemical transport and the Bulk Chemical Code, fulfilling the requirements of Types II and III, some ships also type I.

Some features:
- double bottom
- double skin (Type I and II)
- submerged cargo pumps in each cargo tank

separate cargo line for each tank
often 30-50% of tank capacity stainless steel
some built for dedicated trades or for special products only.

The fourth generation of chemical tankers are now under construction, some of which are already in service (Essberger, Stolt Nielsen). These ships can be considered as New Ships even if their keel was laid before 1st of July, 1986, as they are constructed to fulfil all MARPOL Annex II requirements.

THE FUTURE OF EXISTING SHIPS

Now, in the chemical trade, the original chemical tankers and second generation chemical tankers are very near the end of their feasible service-life.

In the case of long term transport contracts with easy chemicals (Cat. C chemicals), some of these ships may be able to operate until 1994.

Many product tankers constructed after 1980 fulfil the IMO Type III chemical class.

These product/chemical carriers are mostly fitted with deepwell pumps, one in each tank.

Their high standard of stripping efficiency and line emptying systems can easily reach 0,3 m^3 or 0,9 m^3 residue quantities. In tests, some ships have been able to reach 0,1 m^3, without any difficulties.

These "hybrid" ships are threatening the markets of original and second generation chemical ships. Accordingly the future of these less developed ships can be foreseen as weak.

As I mentioned earlier, the third generation chemical tankers are originally built to the code. Most tankers in this class meet the MARPOL Annex II requirements without any improvements. Residue quantities of 0,3 m^3 and 0,1 m^3 are very realistic and easily achieved.

Third generation chemical tankers are very close to the New Ships i.e. fourth generation chemical tankers. Accordingly the chemical trade market will be dominated by these vessels.

NEED FOR RECEPTION FACILITIES

Reg. 7 (1) (a)
"Cargo loading and unloading ports and terminals shall have facilities adequate for reception without undue delay to ships, of such residues and mixtures containing noxious liquid subtances as would remain for disposal from ships carrying them as a consequence of the application" of Annex II.

The eastern part of the Gulf of Finland could be considered as a very special and sensitive area from the environmental point of view. The distance of 12 miles from nearest land and the required depth of 25 m are the two important requirements that cannot be applied in this area.

These two requirements, already by themselves, forbid discharging any noxious liquid substances into the sea, and increase drastically the need of reception facilities in the ports situated east of Helsinki, including the city proper.

The ports in this area should be provided with well-designed and spacious enought facilities that allow ships after unloading to leave the port in a product clean condition, or in case of full back loading leave the port without any residues of previous cargo, or residues that pollute Middle Baltic or the North Sea.

Also products loaded on regular bases require reception facilities in the port areas. According to the spirit of MARPOL Annex II the unloading ports are stressed in importance. However, at the same time, the problems in loading ports rising from slops are forgotten, namely the mixtures/compounds (several grades) that are loaded in the port of Hamina and also partly in the port of Kotka.

Shipowners are waiting for measures concerning the reception facilities from the part of administration, harbour authorities, receivers and shippers. When the question of handling noxious liquid substances rises, it is surprising that the marine environmental protection agency and shipping industry are going hand in hand.

4.2 10 MONTHS AFTER IMPLEMENTATION OF REGULATION 5 - A SUCCESS?

The Chemical Shipping Industry has experienced a most dramatic change during the last 10 years caused by the implementation of international regulations. With the code for the construction and equipment of ships carrying dangerous chemicals in bulk minimum constructional requirements were implemented which have led to a complete new generation of chemical tankers. Vast amounts had to be invested in new ships or, as a minimum, in conversion of existing vessels. However, shipowners have done this deliberately, because they wanted to improve standard of their vessels, both in safety and efficiency. The result of the latter is that shippping of liquid chemicals in bulk over sea is the safest means of transport of all the varieties available.

Shipowners have also been very much in favour of the implementation of MARPOL Convention, last not least because the legal uncertainty about disposal of any residues or washings is internationally brought to an end. It is, however, causing another big investment to shipowners. The association of European Coastal Chemical Tanker Owners, known as ECCTO - in which 34 owners from 13 European countries with about 120 tankers totalling more than 500 000 tdw have organized themselves - has evaluated that by the implementation of Annex II about 95% of the chemical tankers comply with the requirements, and by then owners will have spent more than 3 million dollars for it. Only my company which I represent has been paying more than 1m Deutschmarks counting for MARPOL. The latter comprises full compliance as required as from 1994 for 8 existing ships, as well as two newbuildings which are built in accordance with the IBC-code. The latter two vessels have proven to have a residue content of between 15 and 32 litres per tank.

If one, however, only assumes the permissible difference of 200 litres per tank for IBC-code built as compared with BCH-code these vessels with their 16 tanks do discharge 180 m^3 more cargo in an average of about 56 voyages per anno. The receiver of the cargo is having the commercial benefit while the substance itself cannot penetrate the sea.

With all these efforts in mind shipowners cannot understand, and even in odd cases find it hard to not get emotional, when charterers and/or receivers are so reluctant to receive the slops generated from the mandatory prewash which is only necessary for a minor number of products anyway. Our company, for instance, had all vessels, including those flying the British flag, complying with the regulations as from the 1st of January, 1986, except that the P&A manual was not approved before sometime between April and June. Our instructions to the vessels' masters was to strictly adhere to the regulation, but it seemed to me that there was not many else vessels complying as well.

As a company we have lost quite a number of voyages to others who did not, respectively did not n e e d to comply with the regulations. I may here mention a few of my own experiences gathered:

I) When in May 86 a vessel was fixed to discharge a Category B product in a Baltic port, and the question of mandatory prewash was raised, the answer given by the receiver was that our vessel was the 5th since January this year and none of the owners of the other vessels had ever come up with that request.

II) At another place our vessels have been discharging pure phenol since many years, and as the receiver uses the phenol as an aqueous solution, the ships were delivered a certain amount of water for cleaning and delivery to the shore. The receivers' advantage was to receive even the last drop of cargo, the vessels' advantage was it had no disposal problems. In other words, the ships have been doing a prewash long before the expression as such was known in today's interpretation. It happened this summer that at exactly this port a phenol cargo was to be discharged for Continental charterers, but to other receivers. Mandatory prewash was absolutely new to the charterer. My offer to talk to the installation, of whom I knew consume phenol as an aqueous solution was rejected. My offer to take the slops outside the Baltic Sea Area, provided the mandatory prewash and subsequent transfer of washings into a dedicated tank is surveyed and confirmed in vessels' cargo record book was also rejected, simply because it was so much easier to fix another ship of a non-Baltic flag, whose owner was right to not comply.

III) In another case a vessel was fixed to discharge Category B product in a Baltic port. Lengthy discussions led to the conclusion that the vessel had to perform the mandatory prewash after completion of discharge, but to keep the slops so generated in a dedicated tank for disposal outside the Baltic. When the ship eventually discharged her cargo the master of the vessel was told by the jetty master that he did not understand why the vessel had to take the washings for disposal outside the Baltic as there was ample reception facility at the terminal free of charge. It seems to have been a communication problem internally between chartering office and his own discharge jetty.

IV) At the end of 1984 I did ask all Baltic port authorities in whose ports our ships discharge about their readiness to receive tank washings generated from the mandatory prewash. One harbour master advised me via the agent that the volume of **"B"-products** discharged in that particular port was too small to justify a reception facility. I know, however, that the cargo in question has been discharged in that port-during this year, and that mandatory prewash and reception facility has not been even discussed.

The aforementioned, I believe, is evidence enough to prove that the Regulation 5 for the time being has worked as a flag discrimination to vessels which had to comply, rather than protect those who follow the rules.

Although I could, I am not going to bore you any longer with more sad experiences. I must confess, and happily enough, in the major ports - at least as far as my experience is concerned - charterers and receivers have readily co-operated. The mandatory prewash could be performed. In either case the vessel has to keep the prewash slops on board for disposal outside the Baltic Sea. In one case the receiver of a **"C"-product** has even accepted to receive the washings which is helpful in narrow waters where there is not much room left for the discharge into the sea.

Uncertainties exist still about the question of who is doing the survey of a mandatory prewash. So far we had surveyors from the national authorities, independent cargo surveyors or, in absence of both, even the cargo receiver who surveyed and confirmed that prewash had been done in compliance with the regulations in the Cargo Record Book.

Further concern to shipowners must be the lack of proper port regulations for the performance of mandatory prewash. Whereas at the beginning there were rumors about very stringent, if not prohibitive, rules, I must say, wherever we did a mandatory prewash, it worked practicable and smoothly. Still, a confirmation that practicable rules are implemented by port authorities would be helpful.

Also from shipowner's point of view the term "12 nm from the nearest land" is open for further interpretation. Is the minimum distance to be physically 12 nm from the nearest land or should one add 9 nm to the normal territory zones which include 3 miles of the sea? Is any small island or nacked rock considered to be "land"?

The question of who is reponsible for the ultimate disposal of any slops, be it from mandatory prewash or from any reception for commercial reason, does not seem to have been discussed within MEPC. One can only assume it varies from country to country in accordance with the prevailing national legislation.

Although amended many times already, the list of noxious liquid substances still is not complete. Many products which are not just straight run chemicals, but an admixture of various chemicals - and preferably shipped under a trade name - give reason for concern. It is little help to say that products not listed are not allowed to be shipped over sea. They may find other means of transport, which could result in the fact that the shipping industry is losing business in hard times, while the product is moved somewhere where its presence is causing much more danger to people and environment.

Of great concern to shipowners is the lack of reception facilities for products for which a prewash is not mandatory. Initially Regulation 7 of Annex II simply stipulated that the Governments are to ensure that reception facilities are made available according to the needs of ships without undue delay.

Later one had to realize that - because of the too many different chemicals involved from which slops are generated - this would have to become an exercise which simply could not work, neither operationally nor financially. As a consequence efficient stripping has been made mandatory to ships. The idea for this was that reception facilities will not be needed, unless a prewash is mandatory.

In this connection MEPC has made recommendations to ports and terminals which besides stating the estimates of volumes of residue/water mixtures for the various categories and types clearly says that no port or terminal is required to receive any slops containing substances other than those handled by the port or terminal. Nor is it compulsory for the port or terminal to receive slops other than from those substances for which a prewash is mandatory.

What, however, is a master of a vessel supposed to do, if his vessel discharged a product categorized "C" in Helsinki and is to reload at Hamina? Or a vessel discharges a "C"-product at Turku and is to reload at Söderhamn? Acording to recommendations of MEPC neither port is supposed to provide a reception facility. The master of the vessel departes the vessel in good faith to do the tank cleaning en route while disposing of the tank washings within the about 125 nm where a disposal of tank washings resulting from a product categorized "C" is permitted. Unexpected, however, while the vessel is en route bad weather prevents the vessel from doing the minimum speed of 7 knots. The master is all of a sudden in a difficult situation, because he cannot get rid of the tank washings, and must keep the slops on board.

The result is that:

1. The vessel will not be able to make up its charter commitment. This can cause exorbitant commercial penalties.

2. It becomes even more critical, if because of the presence of a minor amount of slops and a necessary restowage of cargo, the survival stability as required under the BCH-, respectively IBC-code is not any longer maintained.

Further MEPC stipulates that determining the capacity of reception facilities, no allowances need be made for malfunctions of the vessel's equipment.

Malfunctions, however, do happen. What is a solution to this?

To find an answer to the question raised at the beginning of my lecture wether the implementation of Regulation 5 has been a success or not from a ship operator's view, please allow me to get to the following conclusion:

It has not been a success y e t, mainly because HELCOM, in a relatively small trading area, caused such a significant change in trading pattern at a time when the rest of the world only started to prepare itself for the implementation of Annex II.

We hope for April 1937, when the Annex II of MARPOL comes into force worldwide, while then the Baltic is no difference other than it is a special area.

Shipowners believe in the system, but they must be given the opportunity to comply.

This includes that reception facilities are made available, at least for substances for which prewash is mandatory. Owners have prepared the tool, but their efforts is in vain, if not the shore is doing its part of the duty. The compliance of a l l vessels is a must. I must also confess that governmental control over strict adherence is necessary, because it cannot be in anyone's interest, if an owner, while seeking a commercial advantage, is bending the rules.

Last not least compliance must be practicable, otherwise one must fear that traditional seaborne transport will change from troubled shipping industry to shore based transportation which would be counter-productive, and, from environmental viewpoint, is detrimental in so far as transportation is being done where one simply does not want to have it, and where hazard is increased.

4.3 SHIP'S PERSONNEL'S EXPERIENCE IN IMPLEMENTING SOME OF THE REQUIREMENTS OF MARPOL 73/78 AND REGULATION 5 OF ANNEX IV TO THE HELSINKI CONVENTION

PERFORMING THE EFFICIENT STRIPPING TESTS

The Efficient Stripping Test will demonstrate, to the Administration, Shipowner and the Ship's Crew, the following:

1. The amount of cargo remaining after unloading and stripping.

2. The test will also demonstrate the crew's capability of using to advantage the installed unloading and stripping equipment in the ship.

During normal unloading, the above mentioned points do play the main roles while stripping the tanks to the required quantities.

The results of the first point will demonstrate numerical facts, which will help us to define the potential environmental-pollution risks of the ship, as well as demonstrate the level of fitness and condition of the ship as a carrier of noxious substances.

The results of the second point will help us in identifying factors which can vary from one situation to another. Naturally, during official testing situations the crew's ability to manipulate the equipment will influence the end-result of the test, namely, the capacity of the ship's unloading equipment.

Prior performing the Efficient Stripping Test the crew has to pay attention to the following factors:

1. Technical soundness of the cargo handling equipment.

2. The extent to which the crew can manipulate/take the advantage of above mentioned cargo handling equipment.

3. Confirm that enough crew members are present during the testing situation.

While the testing is performed, the cargo officer is in charge and at least two seamen including the pump-man, have to be present.

During testing the owner's representative will also be present.

The representative of the administration is present, in order to verfiy that the test has been conducted properly and he will also conduct the final measurements.

1. The execution of the test is quite time consuming. The tank is filled with water to a sufficient level in order to carry out normal end of unloading procedures. The water is then pumped out to the shore or into another tank, maintaining a back pressure of 1 Bar at the manifold. However, it should be noted that the back pressure will not affect the level of stripping performance. After the remaining water is removed from the tank suction well, and from the pipeline, as well as from pump to manifold and measured. The operation is repeated according to the number of different tanks. From this we can conclude that the number of tanks will affect the time spent on the testing operations: the more number of tanks, the longer will the testing operation take time and vice versa. Note similar tanks.

2. The accuracy required of measurements will also affect to the time required by the test.

3. Additionally, the testing time required is dependent on the ship-crew's skill in manipulating the equipment and their diligence during the operations.

PREPARING THE P&A MANUAL IN CO-OPERATION WITH SHIPOWNER, ADMINISTRATION AND OTHER INTERESTED PARTIES

In order to prepare a Manual meeting the specifications/ regulations of the IMO to the minutest detail all information on the technical characteristics, procedures and practices of the ship have to be gathered carefully. Accordingly resources of one single individual can be in no manner sufficient, even if one has all the practical knowledge and skills required.

While preparing P&A Manuals for four types of ships, I realised how important it was to receive assistance and information from following participants:

1. The crew-members who were involved in the test, as well as the inputs of other non-participating crew-members:

   - Actual information on the methods of procedures.

   - Information on the functional aspects of the different cargo handling systems, their functional soundness and information on the possible changes.

   - Information concerning matters appearing during the practical side of performing the Efficient Stripping Test.

2. Shipowner:

   - The help of gathering the needed resources while preparing the IMO Manual.

   - Owner will obtain the valid IMO Regulations.

   - The assistance of the Technical Division of the Owner.

3. Administration:

   - Drafts of the Manuals prepared by IMO.

   - The Survey Report of the Efficient Stripping Test.

   - Revision of the Manual and possible proposals for changes.

   - Final approval of the Manual.

Normally, the composing and writing of the P&A Manual is a collaboration between the practical knowledge and information in the ship and between the technical know-how and expertise of the Owner's Shipping Department. These two information sources will help in producing the IMO Manual which the crews and other superintendents will find easy to understand and follow.

4.4 PRACTICAL EXPERIENCES GAINED IN THE DETERMINATION OF CARGO RESIDUE QUANTITIES ON CHEMICAL TANKERS

1. INTRODUCTION

Once Annex II of the MARPOL Convention will have entered into force on April 6, 1987, all ships carrying noxious liquid substances in bulk will have to be provided with an NLS Certificate or a corresponding IMO Fitness Certificate. This certificate will be issued by the Administration of the' flag state, provided compliance with the requirements< of the Convention will have been established and confirmed by an initial survey.

The table in Figure 1 contains the requirements to be met by these ships.

As you can see, in the case of Category B and C chemicals the residue quantities remaining in the cargo tanks and associated piping system after unloading must not exceed certain maximum values. These are:

For new ships built after 1st July 1986

0,1 m^3 per tank for Category B substances
0,3 m^3 per tank " " C "

For existing ships, built before the above date

0,3 m^3 per tank for Category B substances
0,9 m^3 per tank " " C "

The values mentioned may be exceeded by 50 1 as agreed measuring tolerance.

Since, as a rule, chemical tankers carry a great variety of substances, the residue quantities stipulated for Category B must be adhered to. On board existing ships the residue quantities permitted may until 1994 be larger (1 m^3 per tank). However, as this implies increased expenditure for cleaning and more restrictions for discharge procedures, 0,3 m^3 per tank + 50 l should be aimed at.

Germanischer Lloyd and See-Berufsgenossenschaft interpret the Guidelines for Surveys established by IMO under Resolution MEPC 25(23) such that the certification according to Annex II shall be performed by following steps

1. Assessment of residue quantities

2. Preparation of the P&A Manual and approval by the Administration

3. Final initial survey on board for verifying, whether all equipment required (e.g. for ventilating and tank washing) is available on board and in compliance with the approved P&A Manual.

Residue quantities are to be determined by an "Efficient Stripping Test" laid down by IMO. The test method is described in detail in Appendix A to the "Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances". According thereto a test is to **be** performed using water, with the ship in gas-free condition.

The Efficient Stripping Test is the most important step in the approval procedure required for obtaining the NLS Certificate and/or the Certificate for Fitness.

The reason why the test is so important is that reaching of the values of residue quantities stated above is absolutely necessary for a ship, after 6.4.1987, to be permitted to carry chemicals. Apart from this, the

results obtained are required for preparation of the P&A Manual, since - as already mentioned - the discharge procedures will differ considerably, if the higher residue values admitted until 1994 are reached only.
In view of the crucial importance of the Efficient Stripping Test it is strongly recommended that the test on existing ships should be performed at as early a date as possible, as the P&A Manual cannot be prepared until after the test.

2. SOME REMARKS ON THE PERFORMANCE OF EFFICIENT STRIPPING TESTS

As already mentioned the details of the test procedure are outlined in Appendix A of the "Standards for Procedures and Arrangements" established by IMO.
I take it that this test procedure is generally known. The following remarks are intended to serve as supplementary information.

2.1 SELECTION OF TANKS TO BE TESTED

According to the IMO Standards, testing of tanks may be dispensed with if they are regarded as being similar to tanks having already been tested.

On the basis of the tests performed by Germanischer Lloyd to date we have found that the quantity of cargo residue remaining in a tank depends in particular on the following factors:

(a) Tank configuration in the aft tank part
(b) Size and arrangement of pump suction wells
(c) Type and location of pump and pipe routing
(d) Location and size of pipes

With (c) and (d) being the same, the larger residue quantities remain always in the pipes running from the aft body to amidships (uphill).

In view of these findings we have recognized such tanks as being similar, in the case of which conditions (a) - (c) are met and pipes are 'in respect of (d) laid more unfavourably, even if the tank length and configuration in the forward part are not identical.

Taking into account these criteria, as a rule, about 50% of all cargo tanks of chemical tankers will have to be tested; the others may be considered to be similar.

On board sister ships, in agreement with various Administrations, approx. 25% of the cargo tanks, but not less than 3 tanks, were tested by Germanischer Lloyd.

It is pointed out that tests of "similar tanks" should only be dispensed with if by the surveyor states that pumping and piping systems of untested tanks are in good operational condition. Statements based on a thorough external inspection have been accepted for this purpose.

2.2 MAINTENANCE OF BACK PRESSURE

According to IMO test requirements, a hose of 10 m in height or a constant pressure valve is to be provided at the manifold for maintaining a back pressure of 1 bar (10 m WG) during the test. Both methods were employed: no practical problems arose. Even though no quantitative comparison was drawn between the results of both methods, it appears that fitting of a constant pressure valve results in smaller residue quantities in the tanks.

3. MEASUREMENTS PERFORMED AND RESULTS

The Efficient Stripping Tests described below were carried out on board existing ships with conventional piping and tank systems. Special stripping systems which are offered on the market have not been considered in this article. However, all'piping systems were equipped with relevant connections for air or inert gas blowing behind the discharge valves of the cargo pumps.

The systems employed on board the ships tested can be subdivided into two main groups:

A. Ships with central pump room and screw displacement pumps.

B. Ships with deep-well pumps, i.e. each tank is provided with a cargo pump and piping system allocated to it.

Results of some Efficient Stripping Tests are presented below. It is our view that these measurements may be considered to be representative in principle for other ships with comparable systems.

I should like to thank the shipowners for having made available to us the documentation and for having agreed to publication of the results.

3.1 MEASUREMENTS ON BOARD SHIPS OF GROUP A

3.1.1 MV LENG

Figure 2 shows the general arrangement of the vessel. It is equipped with 6 wing tanks each and 5 centre tanks.

The cargo piping and pump system are shown in Figures 3 to 5.

When merely looking at piping systems of this kind, one can see that in view of the existing large pipe diameters (in this case DN 350) and the pump filters on the suction side substantial residue quantities will remain in the pipings. Therefore, it is not to be expected, that the values of residue quantities stipulated will be reached without providing additional measures. For this reason, on board the ship considered, as well as on board a number of similar ships, an additional small screw displacement stripping pump was installed. This pump is capable of being connected to each piping system by spool pieces and of discharging the remaining residue quantities through a separate small-diameter (DN 40) pipe. This pipe was connected separately onshore or behind the valves at the manifolds (Fig. 5).

The tables Figures 6.1-6.3 show the results of the test, which were taken from the test protocol of the ship shown.

It can be seen that no residue quantities were remaining in the tanks, due to the excellent suction effect of the screw displacement pumps and the small suction pipe in each tank. Although additional line blowing was not effected on board this ship, residues in the piping were extremely low due to the stripping system.

Other tests on ships with comparable cargo systems generally have shown that compared with residues in the cargo tanks, the residue quantities in the piping systems are more substantial. Residues in cargo tanks if at all were found to remain in the suction wells only or at the tank bottom near the suctions, if - as in the case of MV LENG - no suction wells were provided.

3.2 MEASUREMENTS ON BOARD SHIPS OF GROUP B

3.2.1 MV AMALIE ESSBERGER

As illustration Figure 7 shows, this ship is equipped with 8 cargo tanks with a total cargo carrying capacity of approx. 1800 m^3.

As in case of the preceding example, the wing tanks are unloaded via the central pump room. Additional stripping facilities do not exist. The centre tanks are equipped with deep-well pumps.

It can be seen from the test results (Fig. 8) that in this case, too, residue quantities far below the limit of 0.3 m^3 per tank were reached.

On board this vessel the quantities of residues inside the tanks are relatively large, compared with those remaining in the pipings. This is due to the fact that the tanks are equipped with large suction wells. Except for the quantities remaining in these suction wells, the tanks were dry.

It should be pointed out that the pipes behind the discharge valves of all pumps were subjected to intensive line blowing for more than one minute at a pressure of 6 bar, after pumps had been stopped.

3.2.2 MV RODENBECK

The illustration Figure 9 shows the layout of the vessel, Figure 10 the schematic diagram of the piping system.

On board this vessel there is an option of the hydraulically operated deep-well pumps, type Svanehøj, being connected by spool pieces to the four on-deck main pipings, which have a nominal diameter of 150. The wing tanks are divided by a bulkhead each into two tank sections, which are connected by free-flow valves.

The results of this vessel according to Figure 11 show very clearly the effect of the uphill pipe routing in the aft part of the ship. Despite 3 minutes of intensive line blowing, the residue quantities remaining in the pipings were substantial and it was only possible to accept the maximum values stipulated for the aft tanks by utilizing the admissible 50 1 tolerance.

4. FINDINGS FROM THE RESIDUE QUANTITY MEASUREMENTS PERFORMED

Germanischer Lloyd has so far carried out measurements at more than 30 ships. The relevant findings can be summed up as follows:

4.1 The statutory residue quantities of 0,3 m^3 per tank for Category B substances can be reached as a rule in the case of existing ships equipped with deep-well pumps of types Framo and Svanehøj.

4.2 The same applies to ships with central pump rooms. In the case of ships with large nominal-diameter piping systems additional measures may be required, such as the installation of a special pump for stripping the piping systems.

4.3 Intensive line blowing will substantially reduce residue quantities, in pipings.

4.4 Despite line blowing, the residue quantities remaining in uphill pipings of large diameters ($D \leq 150$ mm) are substantial. Therefore additional measures may be required.

Figure 1

Main construction and equipment requirements for chemical tankers in accordance with Annex II of Marpol 73/78

Existing ships	Keel laying before 1/7/86				New ships	Keel laying 1/7/86 or later			
Product Cat	Requirement	Implementation date	Document	Regulation	Product Cat	Requirement	Implementation date	Document	Regulation
A,B,C,D	Cargo record book [4]	6/4/87	Annex II	Reg 9	A,B,C,D	Cargo record book [4]	6/4/87	Annex II	Reg 9
	P&A Manual [4]	6/4/87	Annex II	Reg 5		P&A Manual[4]	6/4/87	Annex II	Reg 5
A,B,C	Underwater outlet	1/1/88	Annex II P&A Standards	Reg 5 Chapt 8 (Para 8.6)	A,B,C	Underwater outlet	6/4/87	Annex II P&A Standard:	Reg 5 Chapt 3 (Para 3.5)
	Certificate of fitness	6/4/87	Annex II	Reg 12 A		Certificate of fitness	6/4/87	Annex II	Reg 12 A
B	Efficient stripping to 0.3 cu m residue [1]	6/4/87 ultimate date 2/10/94	Annex II	Reg 5 A (2)(a)	B	Efficient stripping to 0.1 cu m residue [1]	6/4/87	Annex II	Reg 5 A (1)
	Alternatively: Stripping to 1 cu m residue Controlled discharge rate. monitoring	6/4/87	Annex II P&A Standards	Reg 5 A (2)(b) Chapt 10 (Para 10.5, 10.6)					
	Note: Substances solidifying at temperatures of 15 deg C and above may not be carried in tanks boundering the ship's side. Tanks to be fitted for heating.	6/4/87	P&A Standards	Chapt 8 (Para 8.2)		Note: Substances solidifying at temperatures of 15 deg C and above may not be carried in tanks boundering the ship's side. Tanks to be fitted for heating.	6/4/87	P&A Standard,	Chapt 3 (Para 3.2)
C	Efficient stripping to 0.9 cu m residue [1]	6/4/87 ultimate date 2/10/94	Annex II	Reg 5 A (4)(a)	C	Efficient stripping to 0.1 cu m residue [1]	6/4/87	Annex II	Reg 5 A (3)
	Alternatively: Stripping to 3 cu m residue No controlled discharge rate. no monitoring	6/4/87	Annex II	Reg 5 A (4)(b)					
	Note: No carriage requirements for solidifying substances [2]					Note: No carriage requirements for solidifying substances [2]			
D	NLS Certificate [3] or certificare of fitness No requirements for efficient stripping, underwater outlet, controlled discharge rate	6/4/87	Annex II	Reg II (1)	D	NLS Certificate[3] or certificate of fitness No requirements for efficient stripping, underwater cutlet, controlled discharge rate	6/4/87	Annex II	Reg II (1)

[1] For special purpose dedicated ships see exemption from efficient stripping in Annex II Reg 5 A paras 6, 7.

[2] Certain Cat. C "oil like" substances so indicated in Annex II may be carried in Annex I product tankers.

[3] Required for ships other than chemical tankers.

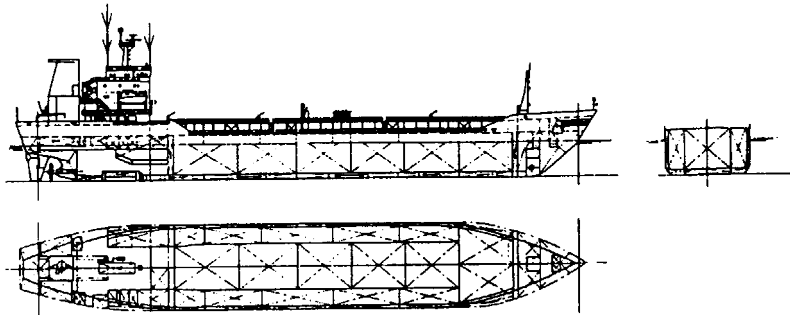
[4] Required since 1. January 1986 by the Baltic Sea Convention for ships sailing on the Baltic Sea.

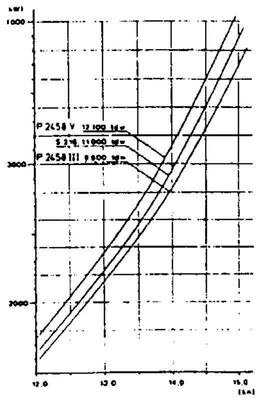
Fig. 1

Germanischer Lloyd

Date 9.10.1985

Figure 2.





MAIN DATA	DIM	P 2458/III	S 216	P 2458/V			
Length over all	m	122.70		134.62		145.10	
Length pp	m	113.45		125.27		135.70	
Breadth	m	19.60		19.60		19.60	
Depth	m	10.65		10.65		10.65	
Draft summer	m	8.61		8.45		8.35	
DEADWEIGHT	t	9 600		11 000		12 100	
Tankcapacities		cbm		cbm		cbm	
Centre tanks	100%	5 413		6 568		7 588	
Sidetanks	100%	4 739		5 593		6 309	
Sloptanks	100%	448		448		448	
Tankcapacity total	100%	10 600		12 609		14 345	
		ENGINE OUTPUT					
TRIAL SPEED		HP	KW	HP	KW	HP	KW
12.0	Knots	2 150	1 580	2 235	1 645	2 380	1 750
12.5	Knots	2 515	1 850	2 610	1 920	2 770	2 037
13.0	Knots	2 920	2 147	3 020	2 220	3 200	2 353
13.5	Knots	3 380	2 470	3 490	2 565	3 700	2 720
14.0	Knots	3 850	2 830	4 020	2 955	4 250	3 125
14.5	Knots	4 410	3 243	4 630	3 405	4 875	3 585
15.0	Knots	5 030	3 700	5 290	3 890	5 550	4 080

$B = P \times b_e \times \frac{24}{1\,000\,000}$ [t/day]

B = fuel consumption per day [t/day]

P = power of engine [kW]

b_e = specific fuel consumption [g/kWh]

Reference:
Shipyard Paul Lindenau

S 216 MT ROCHEN 1 (delivered December 1984)

Class:
[illegible]

Main Dimensions:
Length over all 134.62 m
Length pp 125.27 m
Breadth moulded 19.60 m
Depth moulded 10.65 m
Draught summerfreeboard 8.45 m
Capacity total 12 609 cbm

Deadweight:
Deadweight on summerfreeboard 11 000 t

Speed:
Speed (90% MCR, D = 8.43 m) 14.9 kn

Tonnage:
Tonnage (London) [illegible]
Tonnage (London) 3534 NT

General:
Double skin tanker
Flush surface cargo tanks
Vessel especially constructed for the transport of chemicals and mineraloil products with a specific gravity of max. 1.55 t/cbm

Machinery:
Main engine MaK 8 M 551
Nominal output 4250 kW, 450 rpm
Fuel IF 380
Bow thruster 550 kW
3 Diesel generators each 650 kVA - 380 V 50 Hz
Shaft generator 800 kVA - 380 V 50 Hz
Emergency generator 75 kVA

Ballast Tanks:
All tanks coated with BARLIPOX system
Ballast capacity total: 3637 cbm

Cargo Tanks:
All tanks coated with CAMREX (CAMCOTE ...)
Heating capacity 65 °C
Butterworthheater 4.2 Gcal/h

Cargo Tank Capacities:
Cargo tank I-V PS & SB 5 593 cbm
Cargo tank I-V Centre 6 568 cbm
total 12 161 cbm
Sloptank PS & SB 448 cbm
Total cargo capacity: 12 609 cbm

Cargo Pumps:
4 Screw pumps 540 cbm/h (1 °C)
570 cbm/h (50 °C)

Special Features:
Accommodation fully airconditioned
6 Apartments
19 Single cabins
Oil monitoring system
Lindenau energy saving bow bulb
Separate ballast system

Navigation Plant:
2 Radars ATLAS 5500 R, ATLAS 5500 S
1 Radio direction finder DEBEG 741C
1 Sat Nav MX 4102
Gyro compass ANSCHÜTZ Standard 12
Gyro pilot ANSCHÜTZ
Echo sounder: SIMRAD 603 ...
Wireless equipment DMS 1500 - DEBEG 3010

MT "LENG"

Fig. 2

We

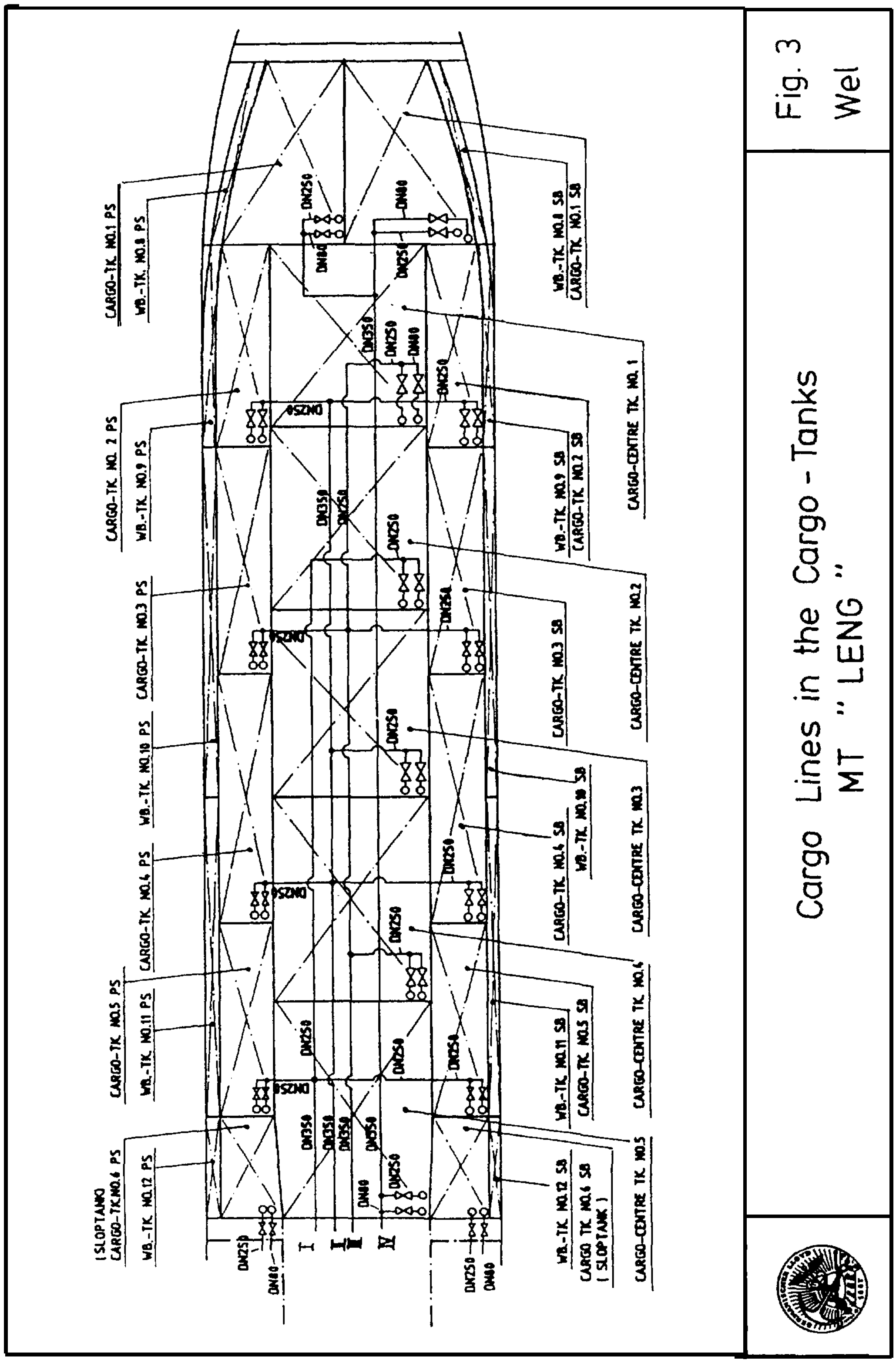


Figure 3.

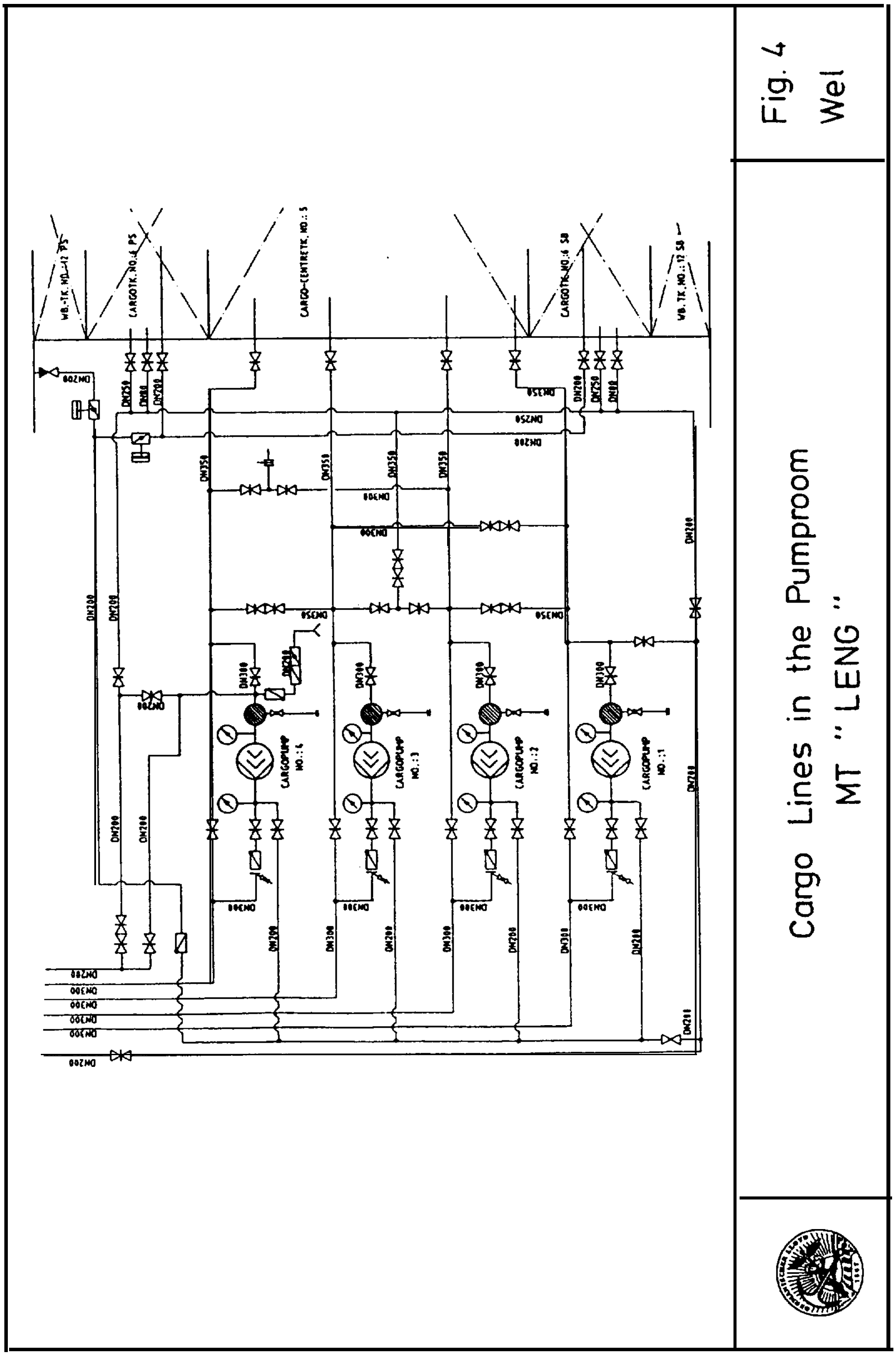


Figure 4.

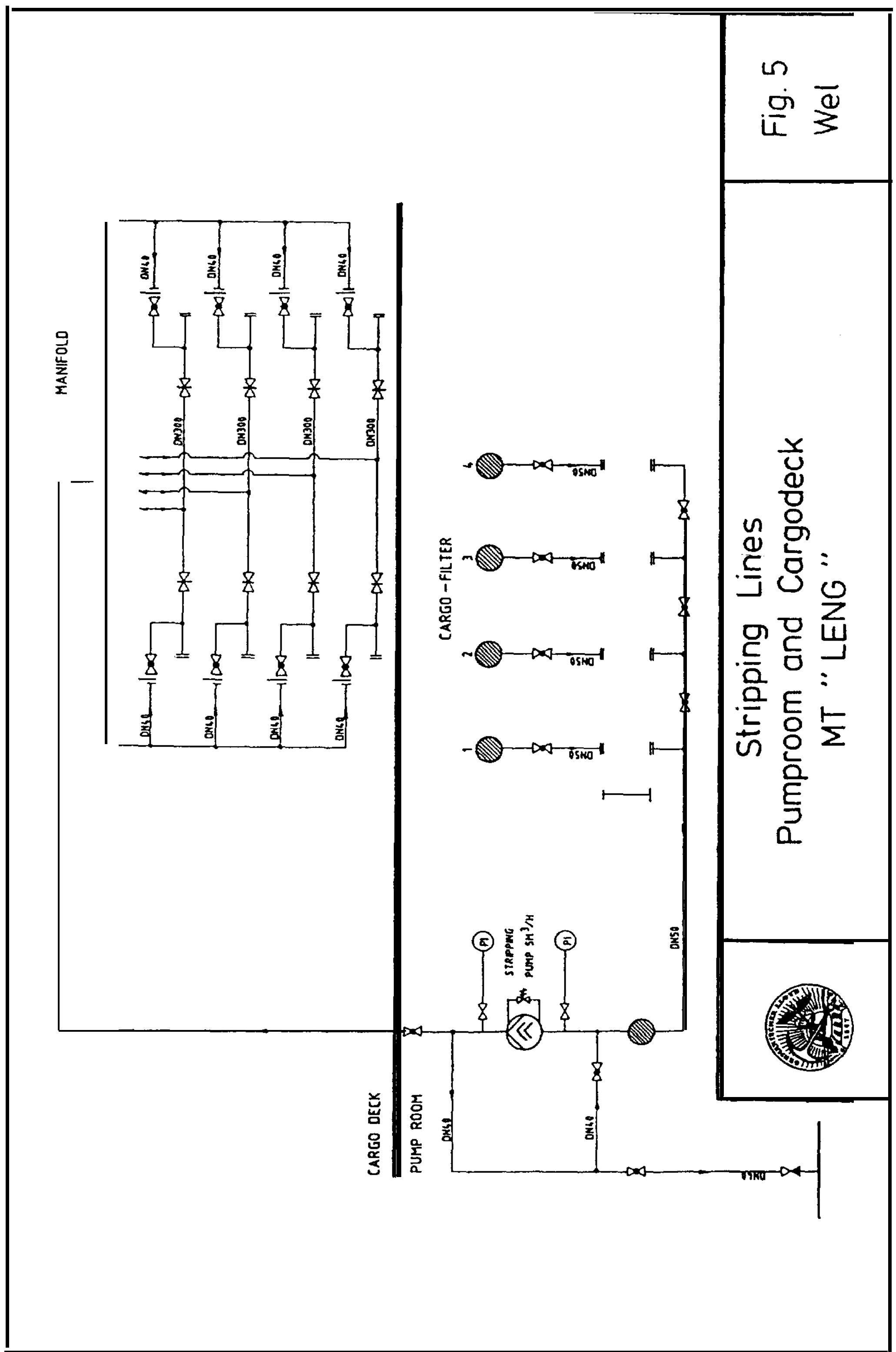


Fig. 5
Wel
Stripping Lines
Pumproom and Cargodeck
MT " LENG "
MANIFOLD
CARGO - FILTER
CARGO DECK
PUMP ROOM
STRIPPING
PUMP 5M³/H
PI
DN300
DN40
DN50

Figure 5.

Germanischer Lloyd

Hater Test of Cargo Pumping/Stripping Systems
on Chemical Tankers

Ship: MT "LENG"

Tank No.	total Vol.(m³)	water level test begin (cm)	Trim (max. 3°)	List (max. 1°)	Remaining water residues (l): Cargo tank suction	entrapped areas tank bottom	drains cargo pump	drains piping system	total	Remarks
1 C	1248,9	30	0,5°	1°	-			19	19	
2 C	1248,3					-		19	19	Tank 1 C
3 C	1248,6	-					-	19	19	Tank 1 C
4 C	1387,6	30	0,5°	1°	-			19	19	
5 C	1435,4	30	0,5°	1°				14	14	
1 P	781,6							14	14	Tank 1 Stb
1 Stb	781.6	30	0,5°	1°		-		14	14	
2 P	445.2							25	25	Tank 5 P

Place Kiel Date July 16, 1986

Surveyor to Germanischer Lloyd

Besichtigung GERMANISCHER LLOYD H. V. Hamburg

Figure 6.1.

Germanischer Lloyd

Water Test of Cargo Pumping/Stripping Systems on Chemical Tankers

Shio: MT "LENG"

Tank No.	total Vol.(m³)	water level test begin (cm)	Trim (max. 3")	List (max. 1°)	Remaining water residues (l) Cargo tank suction	entrapped areas tank bottom	drains cargo pump	drains piping system	total	Remarks
2 Stb	445,2	-						25	25	Tank 5 P
3 P	528,0	-	-		-			19	19	Tank 3 Stb
3 Stb	528.0	30	0,5°	1°	-	-	-	19	19	-
4 P	589,8	30	0,5°	1°	-	-	-	14	14	-
4 Stb	589,8	-	-	-	-	-	-	14	14	Tank 4 P
5 P	451.6	30	0,5°	1°	-	-	-	25	25	-
5 Stb	451.6	-	-	-	-	-	-	25	25	Tank 5 P
Slop P	224,0	-	-	.	-	-	-	14	14	Sloptk Stb

Place Kiel, Date July 16. 1986

Surveyor to Germanischer Lloyd

Besichtigung GERMANISCHER LLOYD H. V. Hamburg

Figure 6. 2.

Figure 6.3.

Fig. 6.3

Germanischer Lloyd

Attachment to Certificate No. 96 351 HH
Sheet No.: . . . ..?.......

Water Test of Cargo Pumping/Stripping Systems on Chemical Tankers

Ship: MT "LENG"

Tank No.	total Vol.(m^3)	water level test begin (cm)	Trim (max. 3°)	List (max. 1°)	Remaining water residues [l] Cargo tank suction	entrapped areas tank bottom	drains cargo pump	drains piping system	total	Remarks
Slop Stb	224,0	30	0,5°	1'		-		- 14	14	-

Place Kiel Date July 16, 1986

Surveyor to Germanischer Lloyd

Besichtigung GERMANISCHER LLOYD H. V. Hamburg

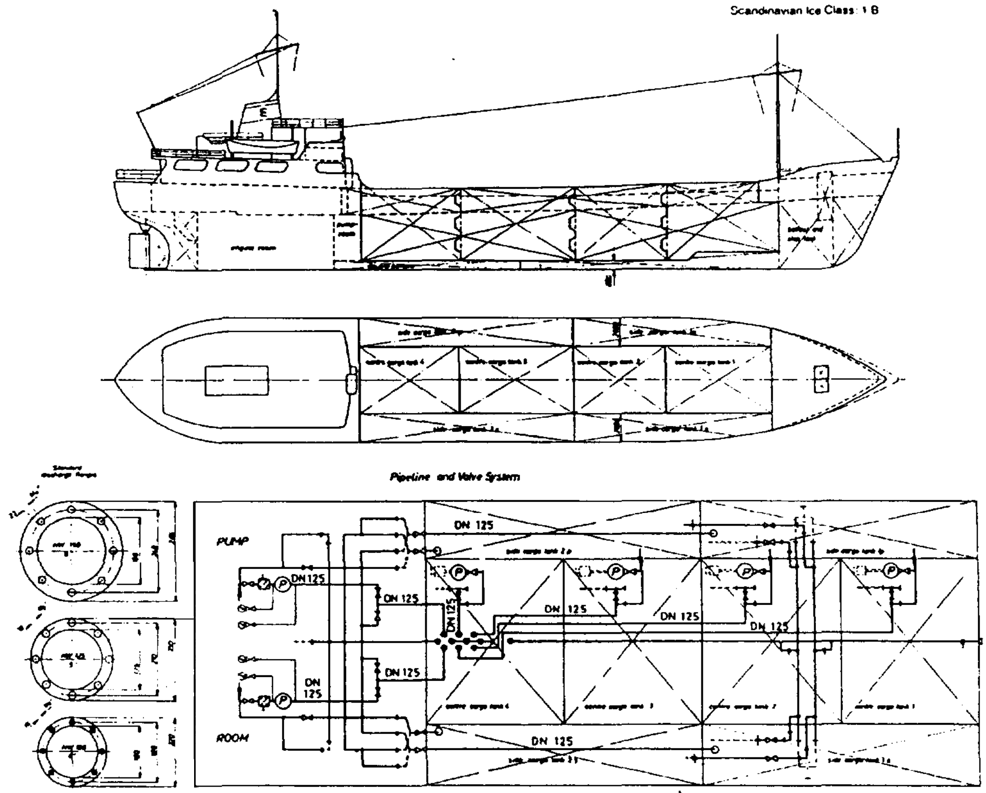
Signal-letters: DAGZ
built: 1972

Owner: John T. Essberger (GmbH & Co.), Hamburg

German Flag, Homeport: Hamburg

Length over all	69.30 m	227' 04½"	Draught fully loaded: summer	4.66 m	15' 03½"	Gross tonnage	982.26 GRT
Length between P.P	64.02 m	210' 00"	Draught fully loaded: winter	4.58 m	15' 00½"	Net tonnage	475.70 NRT
Breadth moulded	10.70 m	35' 01½"	Deadweight: summer	1536 t		Speed	about 12 kn
Depth moulded to maindeck	6.60 m	21' 07⅞"	Deadweight: winter	1485 t			

Class: German Lloyd + 100 A 4 E 2
Chemicaltanker IMO Type 2/Type 3
+ MC E 2 Aut 16/24
Scandinavian Ice Class: 1 B



connections for line blowing

Capacity of cargo tanks:

Compartment	Material of the tank	Volume m^3 – 98.5 % filling
Centre Tank No. 1 Centre Tank No. 2 Centre Tank No. 3 Centre Tank No. 4	stainless steel stainless steel stainless steel stainless steel	262.162 m^3 264.065 m^3 312.486 m^3 273.013 m^3
Capacity Centre Tanks		1111.728 m^3
Side Tank No. 1 P Side Tank No. 1 S Side Tank No. 2 P Side Tank No. 2 S	Dimetcote Dimetcote Dimetcote Dimetcote	147.603 m^3 147.603 m^3 189.484 m^3 189.484 m^3
Capacity Side Tanks		674.174 m^3
Capacity of all Cargo Tanks		1785.902 m^3
Capacity of all Ballast water tanks		695.825 m^3

Special Features:

The vessel is specially constructed for products having a specific gravity of up to 1.7 t/m^3
The vessel is fitted with nitrogen gas system up to 2100 mm head of water overpressure

Pumps: 2 electrical driven cargo screw pumps, 84 m^3/h each,
10 bar for the Side Tanks – each also usable as boosterpump
4 electrical driven cargo Deepwell pumps, 77 m^3/h each,
50 m head of liquid each for the Centre Tanks
1 electrical driven ballast-pump, 115 m^3/h

Cargo tanks and lines:
All Centre Tanks including load – and discharge lines in stainless steel
Remanit No. 1.4435
All Sides Tanks lined with Dimetcote No 4 – this load- and discharge lines with hot galvanizing inside and outside
One overhead-loading line for every cargo tank
Separate lines to all cargo tanks, thus segregation up to 8 grades

Ballast water carried in special ballast tanks

Boiler plant: 1 automatic steam-generator 2.7 t/h
Heating coils in all cargo tanks
Heating system variable for hot water heating alternatively steam heating
Heating capacity Centre Tanks: 0.095 m^2/m^3 = 0.0283 sq.ft./cu.ft.
Heating capacity Side Tanks: 0.13 m^2/m^3 = 0.0305 sq.ft./cu.ft.

TMS "Amalie Essberger"

Fig. 7
Wel

Figure 7.

Figure 8.

Germanischer Lloyd

Water Test of Cargo Pumping/Stripping Systems
on Chemical Tankers

Ship: Amalie Essberger

Tank No.	total Vol.(m³)	water level test begin (cm)	Trim (max. 3")	List (max. 1°)	Remaining water residues [l] Cargo tank suction	entrapped areas tank bottom	drains cargo pump	drains piping system	total	Remarks
1 c	262,2	30	2°	1°	105	-	-	22,5	127.5	
2 c	264.0		-		105		-	22.5	127.5	
3 c	312.5			-	129			7	136	
4 c	273.0	35	2°	1°	129			7	136	
5	147.6	25	2°	1°	10			77	87	
5 a	147,6		-	-	10			77	a7	
6	189.5				13	-	-	80	93	
6 a	189,5	30	2°	1°	13			80	93	

Place . . Hamburg, Date 12 09 1985

Surveyor to Germanischer Lloyd

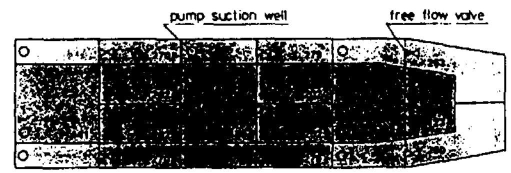
Besichtigung GERMANISCHER LLOYD H. V. Hamburg

BUILT at Büsumer Werft GmbH., Büsum
CLASSED GL ✠ 100 A 4 M E "Chemical Tanker" Type 2
+ M C E Aut "INERT" "Oil Tanker" "KORR"
German flag

PRINCIPAL DIMENSIONS:	Length over all	91.70 m
	Length betw. perp.	83.80 m
	Breadth moulded	13.60 m
	Depth	8.64 m
	Draught	6.23 m
MAIN DETAILS	DEADWEIGHT ALL TOLD:	3,914 tdw
	GROSS TONNAGE:	1,599 GRT
	NET TONNAGE:	1,218 NRT
	SPEED:	12.5 kts
	CONSUMPTION:	7.5 t/day heavy oil 180 cST
	MAIN ENGINE:	Mak 6 M 453 AK 1,470 kW (1,999 h.p.)
	AUXILIARY DIESEL ENGINES:	3 Deutz BA 6 M 816 LLK
	BOILERS:	2 Clayton, type: EO 201
	shaft generator	AEG, type: DKBH 4287/04, output: 300 kVA, 450 V
	bow thruster	Ulstein, type: 24 T – 250
	ELECTRIC CURRENT:	440, 220 V A.C., 24 V D.C.
CARGO PUMPS	11 deepwell pumps	90 m³/h each against 70 m wc
	3 deepwell pumps	100 m³/h each against 70 m wc
	1 booster pump	175 m³/h against 110 m wc

SPECIAL FEATURES

14 grades complete segregation
Heating coils in all tanks (thermaloil-conductor)
holding temperature of cargo up to 60° C
Cargoes of a specific gravity up to 1.9 t/m³ in centre tank and 1.3 t/m³ in wing tanks
closed ullage system
vapour return system
nitrogene inert gas system
automatic overflow alarm / shutdown
tank drying system
modern radio + navigational aids
(including 2 radars + satellite navigator)



cbm — centretanks: stainless steel AISI 316L, IMCO 2 — wingtanks: coated with Dimetcote 3, IMCO 3

CAPACITY OF TANKS: (98 %)

Tank	No.	Capacity
wing portside	1	263 cbm
wing portside	2	279 cbm
wing portside	3	270 cbm
wing starboard	1	260 cbm
wing starboard	2	279 cbm
wing starboard	3	270 cbm
		1621 cbm coated (IMCO 3)
centre	1	123 cbm
centre	2	369 cbm
centre portside	3	202 cbm
centre starboard	3	202 cbm
centre	4	440 cbm
centre portside	5	202 cbm
centre starboard	5	202 cbm
centre	6	441 cbm
		2181 cbm stainless steel (IMCO 2)

CERTIFICATES

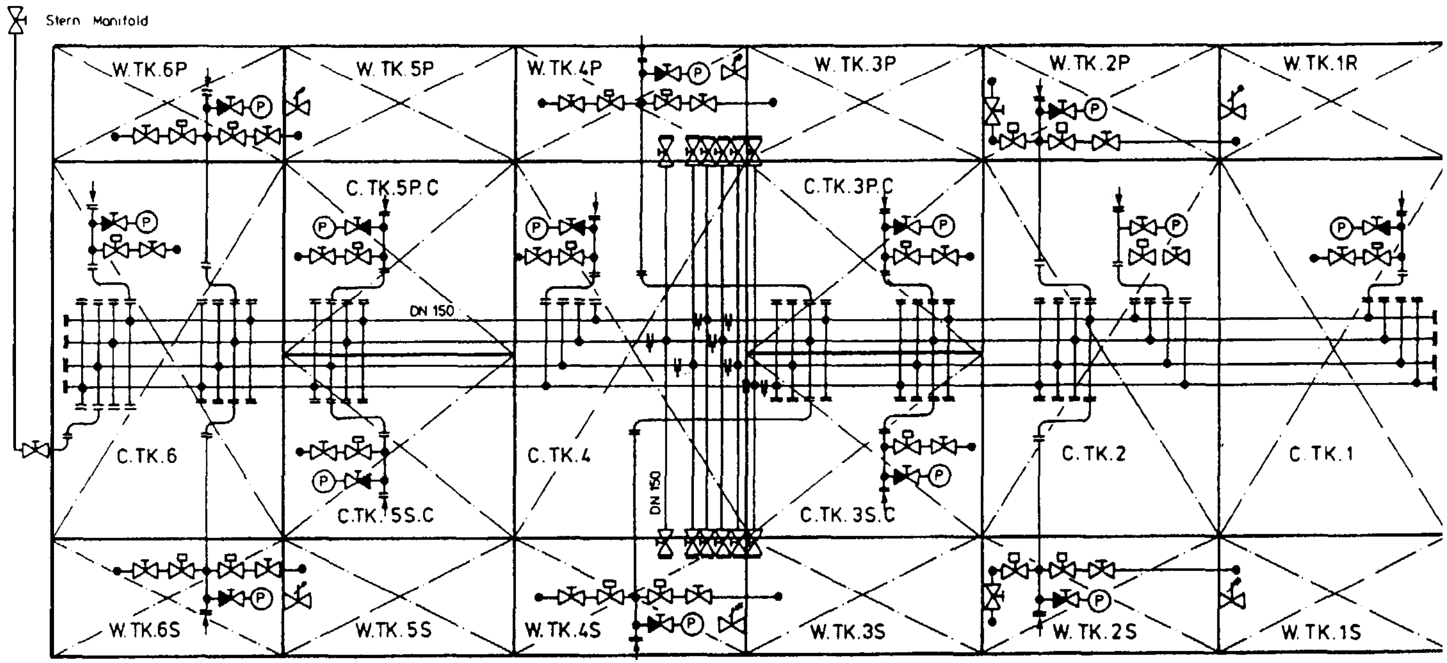
IMCO 2 + 3
R.I.N.A.
U.S.C.G.
Manchester Ship Canal

MT "RODENBEK"

Fig. 9
Wel

Figure 9.

Figure 10



↑ connection for line btowing

Cargo System
MS “RODENBEK ”

Fig. 10
Wel

Germanischer Lloyd

Water Test of Cat-go Pumping/Stripping Systems on Chemical Tankers

Ship: MT "ROOENBEK" ....*...

lank NO.	total Vol.(m³)	water level test begin (cm)	Trim (max. 3°)	L'ist (max.1O)	Remaining water residues [l]: Cargo tank suction	entrapped areas tank bottom	drains cargo pump	drains piping system	total	Remarks
1/2 P	264,6	-	-		152	8		27	la7	lank 1/2 Stb
1/2 Stb	264.6	20	1,5°	1°	152	a		27	la7	
3/4 P	283,9	-			84	6		177	267	Tank 3/4 Stb
3/4 Stb	283,9	15	1,5	1°	84	6	-	177	267	
5/6 P	273.5	-			148	5		177	330	Tank 5/6 Stb
5/6 Stb	273,5	15	1,5°	1°	148	5		177	330	
1 C	123.7	72	1,5°	1'	119	1	-	27	147	-
2 c	369.9	20	1,5°	1°	112	-	-	27	139	-

Place ....Cuxhaven.................... Date ....30.05.86....................

Surveyor to Germanischer Lloyd

Besichtigung GERMANISCHER LLOYD H. V. Hamburg

Figure 11.1.

Figure 11 2.

Germanischer Lloyd

Water Test of Cargo Pumping/Stripping Systems on Chemical Tankers

Ship: MT "ROOENBEK"

lank No.	total Vol.(m³)	water level test begin (cm)	Trim (max. 3°)	List (max. 1°)	Remaining water residues [l]: Cargo tank suction	entrapped areas tank bottom	drains cargo pump	drains piping system	total	Remarks
3 CP	199,7	15	1,5°	1°	03	3	-	27	113	-
3 C Stb	199,7	-			83	3	-	27	113	Tank 3 C P
4 c	452,6	-			145	-	-	170	'315	Tank 6 C
5 C P	199,7	20	1,5°	1°	a3	3	-	177	263	
5C Stb	199.7	-			a3	3	-	177	263	Tank 5 C P
6C	452.6	15	1,5°	1°	145		__	170	315	

Place .....Cuxhaven........ Date .....27.07.1986........l......

Surveyor to Germanischer Lloyd

Besichtigung GERMANISCHER LLOYD H. V. Hamburg

4.5 DISCUSSIONS (SESSION 4)

Mr. Ulrich Jahnke:
Just a comment to confirm Mr. Warnecke's fears that ships belonging to the Baltic Sea states are being discriminated as against-ships from non-Baltic Sea states which do not have to comply with the regulations of the Helsinki Convention.

Mr. Seppo Hildén:
It was a political decision to implement Regulation 5 of Annex IV at an earlier date in the Baltic. It was made by persons who did not have any knowledge of the transport of chemicals in the Baltic. Our country cannot meet all the obligations of this regulation without some delay. Receptions facilities is a major problem. As it is, we have problems with reception facilities for oil and to deny that we will be confronted with even more serious problems with chemicals would be an under-statement. A strong plea should therefore be made to all Baltic Sea Administrations to increase their efforts in ensuring that adequate reception facilities are provided for the ships. As most of the chemical tankers, it has been pointed out, comply with the Annex II requirements, the burden is now on the shoreside and this should be made very clear to the Administrations.

Chairman:
Thank you. We have at least one Baltic Sea Administration which can clarify its position. Our governments are always in a hurry to implement such regulations which causes inconvenience to all of us.

Mr. Uno Oldenburg:
It is now common that the shipowner tries to include a clause in the charter party by which the receivers

or the charterers are made responsible for costs involved in the removal of slops from the ship.

Mr. Jürgen Warnecke:
INTERTANKO and ECCTO have together introduced a chemical waste disposal clause for charter party. Though some charterers in the Baltic Sea'have accepted it, this has not been very well received by the charterers in other parts of the world.

This clause means that the mandatory prewash is free of charge to the ship, but the time used for owners account if the transfer is carried out immediately after discharge. The receivers of charterers pay for the reception and ultimate disposal of the prewash slops resulting from a mandatory prewash. However, if the ship is required to shift berth in order to perform the prewash, then the receiver/charterer pays for the time and costs involved in the shifting as well.

Mr. Anders Kristensson:
As pointed out by Mr. Warnecke distortion of transport pattern is a major threat to shipping in case the pollution regulations are applied only to ships. I suggest that we, through the Swedish Administration - the organisers of the seminar - send a message to the newly appointed Swedish Minister of Environment asking her to fully acquaint herself with the measures being taken by the shipping community to prevent the pollution of the seas and request her that equivalent measures be taken by other branches involved in transportation of chemicals. Otherwise, not only will the shipping community loose business but the pollution of the sea will increase. My company operates a number of tank cleaning stations for road tankers and containers. These stations can be considered as authorized as they are subject to control. From statistics covering the operation of these stations and information derived from

other sources it could be shown that 50% of the road tankers/containers were using the cleaning and disposal facilities while the rest were dumping the waste illegally.

Chairman:
We will take care of the po'int made by you. Thank you.

Mr. John Crayford:
How are substances which have not been evaluated so far being treated in the Baltic Sea by the shipowners and administrations of the Baltic Sea?

Mr. J. Warnecke:
I cannot recall any such case. We relay on charterers for categorization. But I foresee this as a serious problem in the future.

Mr. John Crayford:
There are a number of substances which are presently being transported in chemical tankers as Annex II cargoes. These will probably end up as Annex I cargoes once they are more accurately defined by April next year. Could Mr. Warnecke comment on this?

Mr. J. Warnecke:
Evaluation and categorization is an authority/charterer problem. Not the shipowners'. I know what substances you mean and we hope that they will still be carried in chemical tankers.

Mr. John Crayford:
How are products such as solvent naphtas which are similar to white spirit treated in the Baltic Sea i.e. Annex I or Annex II?

Mr. J. Warnecke:
I am sorry I cannot answer that one.

Mr. Mukul Ghildiyal:
Speaking about substances that have not been evaluated and hence not categorized it is really the shipowner's duty to get the cargo evaluated before putting it into the ship. That Administrations should carry out policing for this is not practical when we are faced with serious cuts in jobs in the public sector. There will be cargoes which will be carried in wrong type of ships until they are ultimately detected during a port state control for example. It was shocking to year yesterday that sulphuric acid was being carried in Type III containment next to the sea. This only shows that there are some non-serious operators in the market and if they want to put their ships into jeopardy it is really their problem.

Mr. Sven Sjökvist:
Some of the remarks made by Mr. Warnecke could be based on misunderstanding and I would like to explain some of them. Firstly the one concerning the request for a prewash for a Cat. B substance in May 86 which was considered strange by the receiver who had had four ships without such a request. Well, if the four ships were bound for a port outside the Baltic Sea the prewash was not required and therefore no request could have been received by the receiver. The reason given in the second case where a ship belonging to a non-Baltic Sea state was preferred for lifting a cargo of phenol is wrong. The regulations are applicable to all ships, irrespective of flag, as long as they are discharging in a port belonging to a Baltic Sea state. The only exemptions in the case of non-Baltic Sea state ships being the requirement to carry a P&A Manual and Cargo Record Book. So the prewash requirement is applicable to all ships. Lastly the case where the harbour master considered that the volume of trade in Cat. B products in his port did not justify a reception facility. Well, what he probably meant was that the port did not require permanent (fixed) reception facilities and mobile tank trucks could meet the small demand of the ships.

Chairman:
Yes, there are several points which need clarification.

Mr.J. Warnecke:
First of all ships of non-Baltic Sea states, to the best of my knowledge, have never been controlled in the same way as ships belonging to Baltic Sea states. I know of many non-Baltic state ships who have never confronted the requirement of a prewash be it from the charterers, receivers or port authorities in the Baltic Sea Area.

Chairman:
Well, regulations are one thing and control is another of course.

Mr. S. Sjökvist:
I am a bit suprised to hear from mr. Pelli that back pressure does not affect the stripping test results. Could you explain?

Mr. I. Pelli:
My experience is with Frank Mohn deepwell pumps and in the case of these pumps we found out that the back pressure did not affect the results.

Mr. S. Sjökvist:
So your statement is valid for Frank Mohn pumps only?

Mr. I. Pelli:
Yes.

Mr. U. Jahnke:
Mr. Pelli has layed much stress on crew competence. Crew competence is handled in the STCW Convention (and associated documents) and crews in our countries must fulfil the competence requirements of the Convention to be able to obtain employement in chemical tankers. Stripping test is to establish the ships performance

capacity and not to prove the crews ability to perform the stripping test. On page 2 of your paper you mention the number of crew members required to assist in the test and their competence - the first is obvious, the other I fail to understand. Could you explain?

Mr. I. Pelli:
I have found out that the results vary depending upon which crew is on board. You are right in saying that the stripping quantity may not differ very much between the crews but they do handle the systems in a different way which gives different results. On a "margin ship" this could be a deciding factor.

Mr. U. Jahnke:
Stripping test is performed once. The idea is to certify the ship and not to verify crews competence. Competence is important but quite a different problem.

Mr. I. Pelli:
But the fact remains that it is a problem.

Mr. F. Westphälinger:
I think it is very important to explain in detail in the P&A Manual the right stripping procedure so that any crew can follow it. As far as the influence of back pressure is concerned it depends upon the system used for stripping. You are right that Frank Mohn type of systems are not affected by the back pressure, but systems where you simply blow the pipe are affected by the back pressure.

Mr. K.Sauri:
There may be different ways for stripping a tank but we have to put the best one down in the P&A Manual. It will give us the best results.

Mr. M. Ghildiyal:
It was a pleasure to hear the views of the ship's crew for once. I will ***now*** apprise you of some of the problems my administration has had in the Annex II matters. The P&A Manuals are not prepared up to the standard. It takes between one and two weeks to go through these manuals and in the end one ends up'doing most of the work necessary to bring the manual up to the standards. When it comes to stripping test, you are right when you say that the crew plays an important role. One chief officer has one way, the other another; and both of them claim that theirs is the best. It also depends upon who is attending the tests from the authorities side.

In Sweden we ask the owner to explain the different methods of stripping in the manual in case there is more than one, and we test the ship with the different methods described in the manual. When it comes to crew knowledge we have found that the owners have done very little to bring their crews up to date with the knowledge necessary to follow the Annex II requirements. Mr. Warnecke mentioned about ships running into problems with damage stability requirements due to the ship being unable to get rid of the slops. Well, I was on board a chemical tanker very recently and it took the Master and the chief officer over an hour to find the right stability book. I will not go into any further details on the time spent by the two to find out how it was to be used.

In another case the stripping test had to be abandoned because the spare parts for the pump were not available and mind you it was a sealing ring which is known to fail quite often. I will conclude by saying that all of us have some responsibility and if we avoid sharing the burden the result will be a chaos which will result in everyone pointing his finger at the other.

Chairman:
Thank you.

Mr. B. Stenström:
In the last case Mr. Westphälinger presented, there are spool pieces between the stripping pump and the connection to the different segregations. Is it not dangerous to have such connections keeping in mind that hazardous chemicals may be dangerous for the crew who will have to change them frequently?

Mr. F. Westphälinger:
The spool pieces are for maintaining segregation. Yes, it may be harmful to use them without care.

Mr. M. Ghildiyal:
No. 5 and 6 Wings in the third vessel, I think, have a bulkhead valve in the transverse bulkhead separating them. Are the tanks to be considered as one tank for the stripping quantities?

Mr. F. Westphälinger:
Yes.

Chairman:
If there are no further questions we have come to an end of a very interesting seminar. I would like to thank all the speakers and the participants for contributing towards its success. I wish all of you a comfortable journey home. Thank you.

SECTION E

RESULTS OF THE AD HOC GROUP MEETING DURING THE SEMINAR HELD IN NORRKÖPING 17-18 NOVEMBER 1986

1. A seminar on the regulations contained in Annex II of MARPOL 73/78 and Regulation 5 of Annex IV to the Helsinki Convention was held at the headquarters of the National Swedish Administration of Shipping and Navigation in Norrköping on the 17th and 18th of November 1986. The Seminar was held under the chairmanship of Mr. Bengt Erik Stenmark (Sweden).

2. In accordance with document HELCOM 7/5b/2/Rev.1 an ad hoc group of experts nominated by the Contracting Parties was convened to evaluate the Seminar.

3. The Group convened under the chairmanship of Mr. Gorbachev, USSR, after the termination of the Seminar on 18th November 1986. The meeting was attended by representatives from all the Contracting Parties to the Helsinki Convention as well as by a representative of the Helsinki Commission Secretariat. The list of participants is attached.

4. As a result of the Groups deliberations, the Group identified the following items discussed at the Seminar which, in the opinion of the Group, would merit further consideration by the MC.

5. The ad hoc group requested the MC to consider whether:

   an address list should be made indicating which authorities in each country should be consulted in order to provisionally classify non-categorized substances;

the contracting parties should be requested to exchange information on test procedures for establishing hazard profiles for such chemicals; and

a short note should be inserted in the "Clean Seas Guide" reminiding the master of a ship that non-categorized noxious liquid substances carried in bulk must not be carried until they have been provisionally categorized.

6. The Group emphasized that classification of substances in Appendix II and III of Annex II to MARPOL 73/78 may need further attention for the purposes of combatting acute discharges arising from grounding and collision in confined and shallow waters and noted that work related in this matter was well under way within EGC CHEM in respect of Appendix II substances only.

7. There are a number of cargoes being carried in the Baltic Sea which have not been evaluated. Noting that it was not permitted to carry such cargoes as the result of entry into force of Regulation 5 of Annex IV to the Helsinki Convention, efforts should be made by the Administrations to identify these shipments destined to and from their ports.

8. The ad hoc group proposed the MC to consider the extension of the risk analysis related to chemical carriers under preparation by EGC CHEM for combatting purposes also in relation to the safety of navigation and ship construction aspects.

9. The _ad hoc_ group noted that IMO Resolution MEPC 24(22) does not cover all aspects of testing oil-content meters in respect of oil-like substances and the guidelines contained in the Resolution would need further attention within IMO.

The Group felt that national delegations to MEPC should be invited to present any difficulties encountered when applying the IMO Guidelines.

10. As a consequence of information presented to the Seminar by representatives of shipowners regarding the lack of reception facilities experienced in some unloading ports since 1 January 1986 the Group felt that a strong plea should be made to the Administrations to take action appropriate for ensuring the availability and adequacy of reception facilities in these ports.

The Group further recommended that the lack of discharge possibilities in certain parts of the Baltic Sea Area (25 m depth and 12 mile from the nearest land) should be taken into consideration in the national planning of reception facilities/arrangements.

The Group recognized that shipowners in certain cases had feared unfavorable treatment at the hands of the cargo receivers in case a report on difficulties encountered in the disposing of residues and mixtures containing noxious liquid substances would have been submitted by the ship according to HELCOM Recommendation 6/11. The Group felt that the MC should seek possible ways to overcome this problem.

11. With reference to paragraph 10 above the _ad hoc_ group requested the MC to consider the need for the elaboration of a map identifying those parts of the Baltic Sea Area

in which discharges can take place and, if a need exists, whether this map should be included in the "Clean Seas Guide" or issued as a separate publication.

12. A need existed to inform charterers and receivers of cargoes on the consequences of using ships which were not equipped in accordance with the rules, or ships that would require extensive use of reception facilities.

The terms of charter should include the use of reception facilities with a clause dealing with the cost involved in the transfer of slops.

13. The ad hoc group noted the lack of control procedures in certain unloading ports which have been experienced by ships since the entry into force of Regulation 5. This has created disincentives to fulfilment of the discharge requirements as well as the requirements for the establishment of reception facilities/arrangements. It was also noted that in certain cases unauthorized surveyors have been exercising control procedures. The MC is invited to take action on this issue as deemed appropriate.

14. The Group finally drew the attention of the 12th Meeting of the MC to the IMO Symposium on reception facilities for noxious liquid substances to be held at IMO Headquarters in London 13-15 May 1987.

A request had been made to the Helsinki Commission Secretariat by the IMO Secretariat to propose a lecturer who would present the experience gained in the Helsinki Convention Area relating to the collection and treatment of chemical wastes (including notification, capacity assessment, costs, safety aspects, etc.).

The Group requested the MC 12 to further pursue this request and also to consider in what way the outcome of the present HELCOM Seminar should be brought to the attention of the forthcoming IMO Symposium.

LIST OF THE PARTICIPANTS IN THE AD HOC GROUP MEETING DURING THE HELCOM SEMINAR HELD IN NORRKÖPING 17-18 NOVEMBER 1986

DENMARK	Mr. Mike Robson
FINLAND	Mr. Seppo Hildén Mr. Olli Pahkala
FEDERAL REPUBLIC OF GERMANY	Mr. F. Westphälinger Dr. A.W. Schötteldreyer Mr. J. Warnecke
GERMAN DEMOCRATIC REPUBLIC	Mr. Herbert Schwarz
POLISH PEOPLE'S REPUBLIC	Mr. Marek Szczepaniak
SWEDEN	Mr. M. Ghildiyal Mr. S. Sjökvist
USSR	Mr. Antonov Mr. Gorbachev Chairman
HELSINKI COMMISSION	Cdr. F. Otzen
SECRETARY	Ms. Alicja Gwadera-Morawiec

SECTION F

ACTIONS TAKEN BY THE MARITIME COMMITTEE (MC) AND THE HELSINKI COMMISSION ON THE OUTCOME OF THE SEMINAR

ACTIONS TAKEN BY THE MARITIME COMMITTEE

The Committee considered a submission by Sweden containing general information on the seminar on the regulations contained in Annex II to MARPOL 73/78 and Regulation 5 of Annex IV of the Helsinki Convention held in Norrkbping, Sweden, 17-18 November 1986 as well as the results of the deliberations of the ad hoc group meeting held on 18 November 1986 which had considered the outcome of the seminar and identified items which would merit further consideration within the Helsinki Convention framework.

Within its mandate the Committee took the following actions on the results from the ad hoc group meeting:

- The Committee requested the Contracting Parties to submit before 1 July 1987 information to the Secretariat on the national authorities which should be consulted in order to provisionally classify non-categorized substances as well as to exchange information on simplified national procedures for establishing hazard profiles for non-categorized substances.

- The Committee decided to consider at its next meeting the question of the prohibition of the transportation of non-categorized noxious liquid substances carried in bulk.

  The Committee invited the Delegations of the Baltic

Sea States to MEPC to present at such sessions any difficulties encountered when applying the IMO Guidelines for testing oil content meters (IMO Resolution MEPC 24/22) in respect of oil-like substances.

The Committee noted that the ad hoc group had recognized that shipowners in certain cases had feared unfavourable treatment at the hands of the cargo receivers in case a report on difficulties encountered in the disposing of residues and mixtures containing noxious liquid substances would be submitted by a ship according to HELCOM Recommendation 6/11. The Committee decided to consider this matter at its next session.

The Committee held the opinion that there was no necessity or desirability to elaborate a map identifying those areas of the Baltic Sea Area in which discharges can take place, as requested by the ad hoc group.

The Committee noted that the ad hoc group had felt the need to inform charterers and the receivers of cargoes on the consequences of using ships which were not equipped in accordance with the rules, or ships that would require extensive use of reception facilities. The Committee decided to revert to this matter at a future meeting.

The items in the ad hoc group report relating to lack of control procedures in certain unloading ports, availability of reception facilities/arrangements and use of authorized surveyors were also considered by the Committee. As a result of the Committee's deliberations on these items the Committee made certain proposals for actions by the Helsinki Commission regarding measures to be taken by the Contracting Parties relating to these items.

The results of the Commission's deliberations on the actions proposed by the Committee are reflected under the subsequent sub-heading.

ACTIONS TAKEN BY THE HELSINKI COMMISSION

The Commission considered the results of the deliberations by the Maritime Committee on matters related to the outcome of the seminar of Regulation 5 of Annex IV of the Convention and endorsed the actions taken by the Committee within its mandate.

Regarding the question concerning control procedures the Commission noted that the ad hoc group had identified the lack of control procedures in certain unloading ports which had been experienced by ships since the entry into force of Regulation 5. This had created disincentives to the fulfilment of the discharge requirements as well as to the establishment of reception facilities/-arrangements. It was also noted by the ad hoc group that in certain cases unauthorized surveyors had been exercising control procedures. Consequently, the Commission decided to urge the Contracting Parties to strengthen their endeavours to apply control procedures by authorized surveyors for the purpose of Regulation 5 of Annex IV of the Helsinki Convention.

As to the availablility of reception facilities the Commission endorsed the view of the Maritime Committee that a strong plea should be made to the administrations to take appropriate actions to ensure the availability of reception facilities in ports where noxious liquid substances carried in bulk are unloaded and that administrations in the national planning of reception facilities/arrangements should take into consideration that there is a lack of discharge possibilities in certain parts of the Baltic Sea Area (25 m depth and

12 miles from the nearest land). As a consequence the Commission requested the Contracting Parties to instruct the responsible national administrations to take appropriate action related to the issues identified by the Maritime Committee.

The Commission finally decided that the seminar report as well as the actions taken in relation to the seminar should be printed in the Baltic Environment Proceedings. The Delegation of Sweden undertook to make a presentation of the material to the IMO Symposium on reception facilities to be held at the IMO Headquarters, 13-15 May 1987.

SECTION G

LIST OF PARTICIPANTS IN THE SEMINAR

DENMARK	Mr. Mike Robson National Agency of Environmental Protection
FINLAND	Mr. Seppo Hildén Finnish Board of Navigation
	Captain Ilkka Pelli Neste OY, Shippping
	Captain Kari Sauri Neste OY, Shipping
	Mr. Olli Pahkala, Chief Inspector Water Management Division Ministry of the Environment
	Mr. Jarl Jaatinen Sähköliikkeiden OY VANTAA
	Mr. Esa Nikunen National Board of Waters and Environment
	Captain Simo Aarnio Finnish Board of Navigation
	Mr. Magnus Fagerström Finnish Board of Navigation

Mr. Peter Niemelä
Technical Research Center of Finland
HELSINKI

FEDERAL REPUBLIC
OF GERMANY

Mr. Jiirgen Warnecke
Head Chartering and Operations
John T. Essberger
HAMBURG

Mr. F. Westphälinger
Germanischer Lloyd
HAMBURG

Mr. A.W. Schöttelndreyer

GERMAN DEMOCRATIC
REPUBLIC

Mr. Herbert Schwarz
Ve Kombinat Seeverkehr und
Hafenwirtschaft
ROSTOCK

POLISH PEOPLE'S
REPUBLIC

Mr. Marek Szczepaniak

SWEDEN

Mr. Kaj Janérus, Director-General
National Swedish Administration of
Shipping and Navigation (NASAN)
NORRKÖPING

Mr. Bengt-Erik Stenmark
NASAN
NORRKÖPING

Mr. Tage Tirén
NASAN
NORRKÖPING

Mr. Sven Sjökvist
NASAN
NORRKÖPING

Mr. Mukul Ghildiyal
NASAN
NORRKÖPING

Mr. Erik Nyström
National Swedish Environment
Protection Board
STOCKHOLM

Mr. Bengt-Erik Bengtsson
National Swedish Environment
Protection Board
STUDSSVIK

Mr. Börje Stenström
Saltech Consultants AB
STOCKHOLM

Mr. Peter Solyom
Swedish Environmental Research
Institute
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