IMCO

INTERNATIONAL CONFERENCE
ON TONNAGE MEASUREMENT, 1969

GENERAL OBSERVATIONS SUBMITTED BY GOVERNMENTS ON A UNIVERSAL SYSTEM OF TONNAGE MEASUREMENT

Observations by Finland

Further observations on a universal system of tonnage measurement have been submitted by the Government of Finland and these are reproduced in the attachment.

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General

The aim of this Conference is to establish a Universal System
of Tonnage Measurement, which will replace the present, different
systems in use. The new system should be as direct and simple as
possible, consistent with the purposes to be served. These pur-
poses can be divided into two groups, one concerning commercial
matters, the other administrative matters. The present net tonnage
was originally intended to be a true measure of a ship's cubic
capacity of cargo and passenger spaces. As an expression for the
ship's earning capacity, it has been used as a base when levying
dues, fees and other expenses, i.e. for commercial purposes.
The present gross tonnage, intended to express the size of a
ship, has been used as paremeter in several international con-
ventions, for instance the SOLAS convention, it is further used
in manning scales and wage tariffs, for statistics and other
administrative purposes.

Today the net and gross tonnages of a ship are no appropriate
expressions for neither the capacity nor the size of the ship.
It is obvious that regulations determining the tonnage figures,
which, for instance from the shipowner's point of view, have no
useful, positive value, only telling him how much he continually
has to pay and how expensively a ship has to be built and equipped,
have been and will always be worked in a direction which will
produce lower figures. The present deduction of propelling
machinery spaces, the exemption of shelter deck and other "open"
spaces and the exemption or deduction of water ballast spaces
are typical examples of regulations aiming at the reduction of
tonnage figures.

The original Moorsom system has developed into several
branches, each producing different tonnages. Apart from basic
definitions and regulations, there is a jungle of decisions, inter-
pretations and instructions. A lot of them are trifles, which can

be important when measuring very small ships, but ridiculous when
applied to big ships. It has no significance, whatsoever, if the
volume of a spare cabin lavatory is exempted or deducted hen
calculating the tonnage of a big ship.

The present situation makes a new, simpler system a necessity.
The new system must produce tonnage figures similar or corres-
ponding to present net tonnage figures, in order not to change
the present distribution of dues, fees etc. on different types of
ships. The new system should also produce gross tonnage figures
as close as possible to existing figures, in order to preserve,
for the sake of simplicity, the familiar gross tonnage limits in
use in international conventions, and the continuity of statistical
tables.

Most proposals for a new system have recognized these points,
and an impressive amount of work has been done in various countries
in order to find out the effect of these proposals and their amend-
ments, when applied to existing groups of ships. Because of the
differences between the systems in use it has not been possible to
develop a new system which would closely fit all existing ships.

But the main interest at this Conference should rather not be
concentrated on the desire to produce a new tonnage measurement
system, which in the first place is convenient for existing ships.
This Conference should not afterwards be compared to that famous,
ancient tribe, where all the men were fast runners, backwards.
They did not mind where they were going, but the had a tremendous
interest for where they had been. Therefore, we should be our best
to foresee what different, specialized types of ships there will be
built in the future, and how these can be measured for tonnage in
an appropriate way. All now existing ships will probably be gone
within 50 years, but the new tonnage measurement system will exist
maybe for a century or more, just like Moorsom's system, still in
force, even if badly maltreated during 115 years.

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The new system has to be a simple one. It is a well known fact that the more detailed any rules are, the easier it will be to find loopholes and evade the rule makers' intentions. But even simple tonnage rules will constantly be exposed to forces, striving for amendments resulting in lower figures, if these same figures are not used for anything else than determining expenses. Therefore, in order to counteract this trend, it would be wise to choose as tonnage parameter a characteristic, which definitely indicates also the earning capacity of a ship, i.e. the real cubic capacity or the deadweight capacity of cargo ships.

Proposals A and B, Including Compromise Proposals

Bearing in mind that the new system must produce tonnage figures corresponding to the present net tonnages, it has not been possible to devise a new volumetric system without retaining the illogical exemption of "open" spaces. This in combination with an unlimited deduction of water ballast spaces results in net tonnage figures which poorly reflect the real capacity of a ship. Some already existing types of cargo ships would get a net tonnage equal to zero and more of the kind is likely to follow. Some shipowners would find this very pleasing, but it would certainly not be accepted by due-collecting authorities. Therefore, it has been proposed that net tonnage should in no case be less than 35, perhaps 60 per cent of gross tonnage. Finland is of the opinion that a tonnage measurement system which can result in a zero net tonnage for a cargo ship is quite unsatisfactory.

Even if the total cubic capacity of cargo spaces is included in the net tonnage calculations, some already existing types of ships would get an undue advantage. The net tonnage cannot properly indicate the capacity of a container ship, which carries more than half the cargo in weathertight containers on deck. The same goes for the lash-ships, which carry their cargo in watertight lighters or barges. Should the containers or the lighters

carried on deck be measured also and included in tonnage?   The
next step along this line is maybe a floating dock type of ship.
How can the tonnage of such a ship be adequately ascertained by
volumetric methods?

Therefore, it seems that volumetric tonnage measurement
systems have to be abandoned.

Proposal C, Including the Danish Proposal

This proposal suggests that ships should be measured for
displacement and volumetric gross tonnage. The Finnish opinion
is that both these values represent the size of a ship. Neither
is linked to the net tonnage or the earning capacity of a cargo
ship. Linked to each other are: net tonnage - volume of cargo
and passenger spaces - deadweight - earning capacity of ship, and
on the other hand: gross tonnage - total volume - displacement -
size of ship.

If the intention is to substitute displacement for net tonnage
as a base for port dues etc., the present dues-balance between
different types and sizes of cargo ships will be adversely affected,
just because displacement is not commensurate with net tonnage.
Some types of ships have a displacement numerically about six times
bigger than the present net tonnage, other types have a displace-
ment of only about three times the net tonnage.

Further, all large ships would get an extra advantage over
small ships of the same type. For instance, the deadweight/dis-
placement ratio is 0.86 for a 200.000 tdw tanker, but only 0.75 for
a 20.000 tdw tanker. (According to a paper issued by Lloyd's
Register of Shipping 1967.) The effect of this is that the small
tanker would have to pay 1 per cent more in port dues than the
large tanker for every ton of cargo loaded or discharged.

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Then there are ships which have to be stronger and heavier
than other similar ships. For instance ships strengthened for
navigation in ice. It has been said that their earning capacity
is increased, similarly to other specially equipped vessels. It
might be so in some cases, but there are other areas except
Finland which are forced by climatic conditions either to have
ice strengthened ships, or to hibernate over winter. By ex-
perience we in Finland know that ice strengthening is a heavy
drawback, which the Finnish shipping has to endure. Dues based
on displacement would mean a continuous extra tax in every port
around the world.

The nuclear ship is another type of vessel, which has to
be extra strong and heavy for the sake of safety. Nuclear
merchant ships are very few in number now, but there will be more
of them in the future, when oil reserves dwindle. Why should
these ships now be put into an unfavourable position because of
their heavy radiation shielding and reinforcements against
collision damages? The weight of the radiation shield in the
Savannah is about 1.769 tons, in the Otto Hahn about 1.130 tons
and their deadweight/displacement ratios are 0.46 and 0.58
respectively. Another disadvantage of a displacement based
system is the difficulty to exercise a purposeful control. The
main dimensions stated in the tonnage certificate do not reveal
the real displacement of the ship, and even if a lines drawing
is supplied, control will be a cumbersome affair.

And last, but not least, the displacement is not a practical
numerical value in common use in shipping, and it is not an index
of the earning capacity of a cargo ship. Consequently, tonnage
measurement regulations for the determination of displacement
will by and by be amended so as to give lower figures. This
trend is already visible. Submitted amendments to proposal C
suggest for various reasons that instead of the displacement

in salt water, either the moulded displacement or the displace-
ment in fresh water should be used. And obviously at least
Finnish shipowners would do their utmost to have a regulation
inserted which allows for deduction of the weight of the ice
strengthening of cargo ships. This is only the beginning, what
would follow is easy to imagine.

The Finnish Proposal

These considerations, in the first place concerning the
measurement of cargo ships, which form the main part of the world
merchant fleet, and between which the heaviest competition in
shipping occurs, motivated Finland to make a proposal for a
tonnage measurement system. The proposal, which is unanimously
carried by all Finnish parties concerned, makes use of the
deadweight as a parameter when determining the tonnage of cargo
ships. The certified deadweight should be the base for dues,
fees etc. e all know that the deadweight is the most important
numerical value, stating the carrying capacity and thereby the
earning capacity of a ship. Consequently, no shipowner is tempted
to have a smaller deadweight certified than he can use, because
this would also diminish his revenues. From the due-collecting
authorities' point of view it is important that the parameter on
which dues are based remains stable. With this system in force
we will not again find that ships increase in size but decrease
in tonnage.

As a tonnage figure as close as possible to the present gross
tonnage is desirable it is proposed that the gross tonnage of a
cargo ship should be calculated by multiplying the certified
deadweight by a constant factor. A factor of 0.5 would suit
existing paragraph vessels and other small ships best, but for
bigger ships a factor of 0.67 would be more appropriate, being
the present gross-tonnage/deadweight ratio. If this Conference

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decides that existing ships shall retain their present gross
tonnage, it will be easier to settle which factor shall be used
for the calculation of the gross tonnage of new cargo ships.

When calculating the gross tonnage of a cargo ship, the total
deadweight corresponding to the maximum draught which the ship
is designed for and its scantlings permit should be used. This
corresponds to the present ruling that the higher gross tonnage
of a ship will apply for the purposes of safety.

The deadweight parameter will not, of course, appropriately
determine the tonnage of passenger vessels and other ships, which
carry neither cargo nor passengers. Therefore, it is proposed
that these types of vessels should be measured for displacement.
This parameter was chosen for the reason of similarity, displace-
ment and deadweight being measures of the same kind. The displace-
ment of a passenger vessel indicates the size and also fairly well
the service capacity and thus the earning capacity of the ship.
Spacious, comfortable accommodation and all kinds of facilities
increase the displacement but also the earning capacity. As
the present gross tonnage and the displacement of passenger vessels
have about the same numerical value, it is proposed that the
certified gross tonnage of a passenger vessel should be equal to
the displacement of the ship.

The displacement also provides an index of both the size and
the functional capability of vessels, which carry neither cargo
nor passengers. The main machinery output would be a more
suitable index for tugs and icebreakers, but a system with several
different parameters would be too complex.

Two diagrams have been prepared in order to show the re-
lationship between present net tonnages and corresponding dead-
weights and displacements. They are annexed to this paper. The
dots in the first diagram represent all kinds of cargo ships, from

paragraph vessels below 500 gross tons to 200.000 tdw tankers, taken at random from Lloyd's Register of Ships. The drawn line shows that the average net-tonnage/deadweight ratio is about 0.375 for all types of cargo ships, irrespective of tonnage mark being submerged or not. The only dots falling considerably out of line represent ore carriers, measured in accordance with such existing measurement systems, which exempt water ballast spaces and consequently result in very low net tonnages. A sister ship measured according to Oslo-rules gives a dot close above the line.

In the second diagram net tonnage is plotted against displacement for a number of passenger ships, combined passenger/cargo ships and ferries. Data for these ships were originally submitted to IMCO. The drawn line shows that if due-collecting authorities apply the same rate to passenger vessels as to cargo ships, most passenger vessels as well as combined ships and ferries would get comparatively smaller fees.

Further arguments for the proposed Finnish system are:

(a)   It has no influence on design, safety or efficiency of a ship, and it is independent of details of construction.

(b)   The tonnage of a projected new ship is known from the start, since the deadweight and the displacement are the basic data when a new ship is designed.

(c)   No measurements and calculations are required only for the determination of tonnage.   It has been said that establishing of deadweight is difficult and causing serious disputes between shipowners and shipyards regarding how to calculate the deadweight. The reply is that the deadweight has to be stated anyway, and that

NRT=0.35×DWT

1 CARGO SHIPS

ORE CARRIER (OSLO RULES)

ORE CARRIER

TOTAL DEADWEIGHT IN TONS
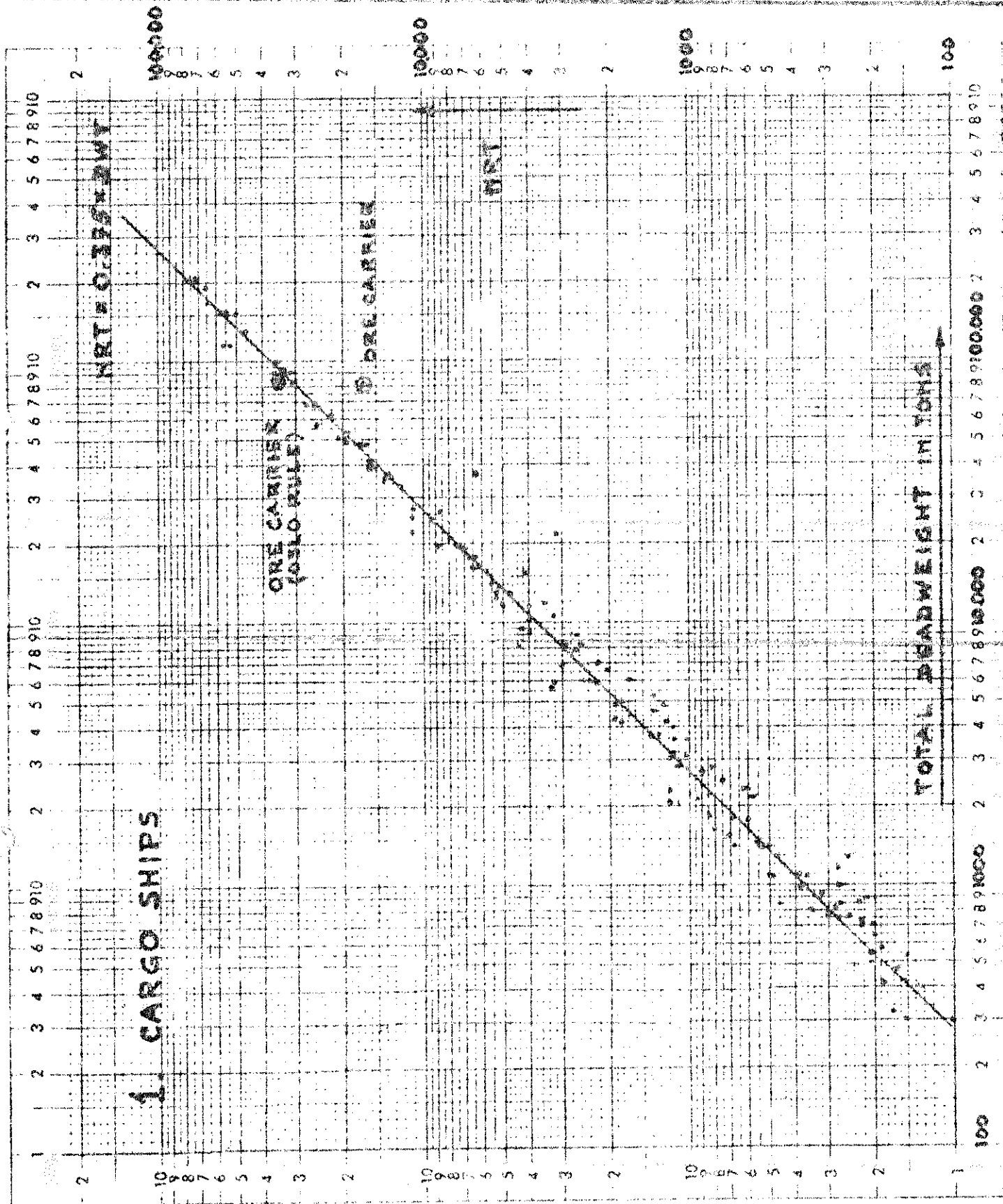
2. PASSENGER SHIPS
COMB. PASSENGER/CARGO SHIPS
FERRIES

NRT = 0.375 DSPL.

NET

DISPLACEMENT IN TONS