PLVAC Paper No. 12/2001

PROVISIONAL LOCAL VESSEL ADVISORY COMMITTEE

PROPOSAL FOR A NEW TONNAGE MEASUREMENT SYSTEM FOR LOCAL VESSELS

1 Purpose

The purpose of this paper is to seek members' approval on the adoption of a new system of tonnage measurement for locally licensed vessels.

2 Present Situation

2.1 Presently, the tonnages of local vessels are measured by various methods for various types of vessels as indicated below (*in the following paragraph "Tonnage Reg" means the Merchant Shipping (Registration)(Tonnage) Regulations)*:

No	Measurement Method	Applicable Vessel
(i)	International Tonnage Measurement 1969 Convention (ITM), gives effect by Part II of Tonnage Reg	? 24 m Hong Kong registered vessel
(ii)	"Rule I method" in Part III of Tonnage Reg	< 24 m Hong Kong registered vessel
(iii)	"Rule II method" in Part III of Tonnage Reg (but modified for application to local vessels)	launch, ferry vessel
(iv)	Thames measurement	vessels other than the above

2.2 The above methods (i) and (iv) involve the calculation for tonnage based on formula, as shown at Annex 1. The methods (ii) and (iii), the details of which are given in Schedule 5 of the Tonnage Reg., originate from the British measurement system and require very complicated and tedious calculations.

2.3 Currently the tonnages of the vessel is used for the following purposes:

(i) the criteria on the application of safety and pollution prevention regulation requirements. For example, oily water separator is required to be fitted on oil tankers with gross ton (GT) exceeding 150, and other vessels with GT exceeding 400, etc.;

(ii) the determination of fees for survey of vessel, berthing at ferry terminals, and for permit to break up vessel;

(iii) the grading of coxswains in the local certificate of competency system. Presently the system is graded in 60 net ton and 300 net ton. (In future it will be graded based on vessels' length to an upper limit of GT 1600).

(iv) the harbour authority of the Mainland ports normally use the vessels' tonnage as the basis for charging port dues.

3 The Need for a New Tonnage Measurement System

The existing tonnage measurement system for local vessels requires an overhaul having observed the following:

(i) as vessels have been measured by different methods, the tonnages of similar size but different type of vessels may vary considerably, as illustrated at Annex 2. If an unified measurement system is adopted it will lead to the equitable application of safety and pollution prevention requirements for all types of vessels;

(ii) the Thames method has an inherent deficiency due to the element *Length minus Breadth* in the formula that a vessel's tonnage would become lesser if the vessel's Length/Breadth ratio decreases, and would become zero should *Length* is equal to *Breadth*. As there is a trend that new dumb lighters are built with increasing beams, the Thames method is not suitable for determining the tonnage of these wide beam vessels. Furthermore, the depth of the vessel and the volume of superstructure of vessel are not included in the formula thus the size of the vessel is not truly defined by the formula;

(iii) as the vessels applying for licence are increasing in size, there is the need for a proper method to determine vessels' (which are not HK registered) tonnages by which the manning requirements are governed. (Presently licensed vessels exceeding GT 1600 are HK registered and are measured by ITM);

(iv) the Mainland authorities had stated at the past liaison meetings with the Hong Kong Marine Department (HKMD) that the tonnages for various types of Hong Kong licensed vessel are not consistent with the general standard. Thus if the licensed vessels plying to the neighboring ports are measured by a method similar to ITM, it would be fair for both the shipowners and the harbour authorities.

4 Proposal

4.1 It is suggested that a new tonnage measurement system should be formulated for the licensed (i.e. not Hong Kong registered) vessels. The new system should be comparatively simple so that minimal effort is required on the computation but reasonably accurate result is obtained for the purposes.

4.2 It is proposed that in future **new** vessels of –

(i) traditional construction (e.g. wooden fishing vessels, kaitos, etc. which are not built to drawings) of any length, and all vessels of less than 24 m are to be measured by a "Simplified Method", which is explained in the following paragraph; and

(ii) other than (i), are to be measured by ITM.

(Note: A new vessel is a vessel applying for licence on or after the enforcement of the Merchant Shipping (Local Vessels) Ordinance (LVO))

4.3 The "Simplified Method" is derived from the ITM. It will use the same formula and tabulated K_1 coefficients of the ITM, except that the underdeck volume will be obtained by multiplying the ship's principal dimensions (Length, Breadth and Depth) by a hull form factor, which is predetermined based on the statistics of hull form of vessels normally seen in HK. The above deck volume will be obtained by multiplying the overall length, breadth and height of superstructure (*l*, *b* and *h* respectively). Thus detailed calculations of above deck and under deck volumes are eliminated.

4.4 It is also proposed that charges should be levied for the tonnage measurements for -

(i) all **new** vessels; and

(ii) existing vessels, if requested by the owners for the re-measurement or undergone major modifications.

5 IMPLICATIONS

5.1 As illustrated at Annex 2, the ITM tonnages are in general less than the tonnages obtained by other methods. Thus the tonnages obtained by the new measurement method will be smaller compared with the existing.

5.2 It is intended that the new measurement method should apply to new vessels only. The present tonnages for the existing vessels should be retained. However, should the owner of an existing vessel request his vessel to be re-measured (for the advantages of lower survey fees or lower safety/pollution prevention requirements, etc.), his vessel will be re-measured at a fee.

5.3 The fee will be charged on work done basis at the current rate of $1,115 per hour. It is expected that the time required for carrying out a more detailed measurement under ITM will be about 2 hours and that for the Simplified method about 1 hour. These fees are small compared with the construction cost of a new building vessel. The fee will be only applicable to new vessels for the first licence and there will be no recurrent charges in the subsequent years.

6. RECOMMENDATION

It is recommended that, upon the enforcement of the LVO,

(i) a standardised system of tonnage measurement is to be adopted for new licensed vessels;

(ii) such methods of the tonnage measurement are to be included in the Code of Practice - Safety Standards for Class I, II, III Vessels for the guidance of the staff of HKMD and the industry.

7. Members' endorsement of the proposal in paragraph 6 above is sought

Local Vessels Safety Branch
Shipping Division
Marine Department
Hong Kong S.A.R. Government
October, 2001

[Ton Measure\PLVAC Paper 011015]

The 1969 Tonnage Convention (ITM)

Regulation 3

Gross Tonnage

The gross tonnage (GT) of a ship shall be determined by the following formula:

$$GT=K_1V$$

Where: V = Total volume of all enclosed spaces of the ship in cubic metres,

$K_1 = 0.2 + 0.02 \log_{10}V$.

Regulation 4

Net Tonnage

(1) The net tonnage (NT) of a ship shall be determined by the following formula:

$$NT = K_2V_c\left(\frac{4d}{3D}\right)^2 + K_3\left(N_1 + \frac{N_2}{10}\right),$$

in which formula:

(a) the factor $\left(\frac{4d}{3D}\right)^2$ shall not be taken as greater than unity;

(b) the term $K_2V_c\left(\frac{4d}{3D}\right)^2$ shall not be taken as less than 0.25 GT; and

(c) NT shall not be taken as less than 0.30 GT,

and in which:

V_c = total volume of cargo spaces in cubic metres,

K_2 = $0.2 + 0.02 \log_{10}V_c$,

K_3 = $1.25\ \frac{GT + 10,000}{10,000}$,

D = moulded depth amidships in metres as defined in Regulation 2 (2),

d = moulded draught amidships in metres as defined in paragraph (2) of this Regulation,

N_1 = number of passengers in cabins with not more than 8 berths,

N_2 = number of other passengers,

$N_1 + N_2$ = total number of passengers the ship is permitted to carry as indicated in the ship' s passenger certificate; when $N_1 + N_2$ is less than 13, N_1 and N_2 shall be taken as zero,

GT = gross tonnage of the ship as determined in accordance with the provisions of Regulation 3.

THAMES TONNAGE FORMULA

總噸 GT = $\frac{B(L - B) \times B}{188}$

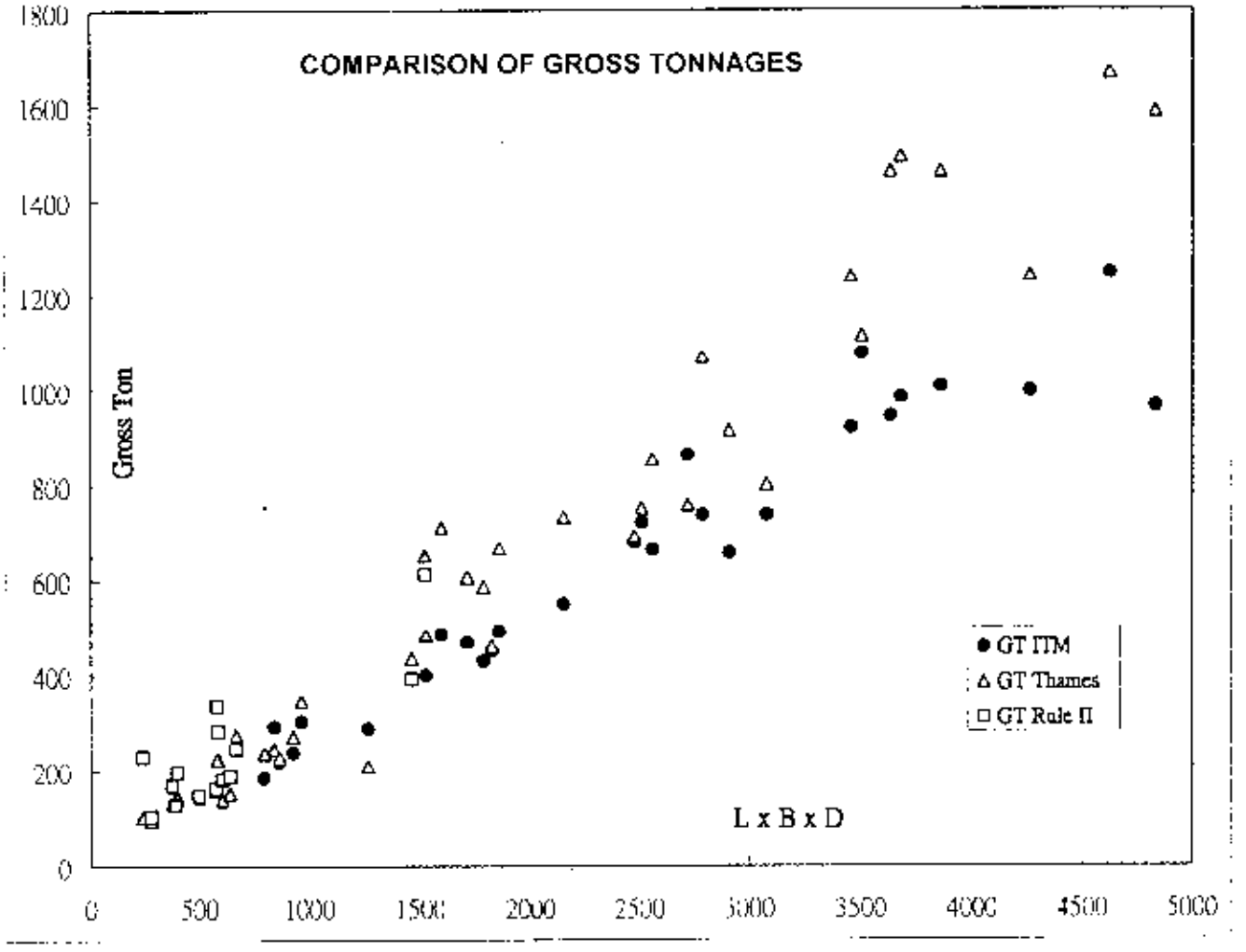
L: Ship length (feet)

B: ship breadth (feet)

$= B^2(L - B) \times 0.1877$ (metric units)

淨噸 NT = GT x 0.7

擔數 PICUL = GT x 17


COMPARISON OF GROSS TONNAGES
Gross Ton
L x B x D
GT ITM
GT Thames
GT Rule II
0
200
400
600
800
1000
1200
1400
1600
1800
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000