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CONSIDERATION OF THE DRAFT TEXT OF ANNEX I OF THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973

Minimization of Oil Pollution from Oil Tankers due to Bottom Damage

Submitted by the United States of America

## The Coastal Marine Environment

Although they constitute only 12.5 per cent of the ocean's surface, coastal ocean waters are vitally important. Heavily burdened with waterborne commerce, coastal waters are also used for recreational fishing and boating, commercial fishing, and waste disposal. Despite these heavy and often conflicting uses, coastal waters and especially wetlands are still the most biologically productive part of the world's ocean; an estimated 90 per cent of the world's marine food resources are harvested there.

## Tanker Accidents

Tanker accidents in general, and strandings and collisions in particular, have been extensively studied within the past few years by authorities in many countries. Despite differences in the nature and scope of the various studies, the principal findings are in general agreement. This Note is based in part upon the study conducted in 1969 and 1970 in the United States which was submitted to the Preparatory Session to this Conference. At present a similar analysis is being completed for 1971 and 1972. Preliminary findings of the later study corroborate the main conclusions of the 1969-1970 study, especially with respect to strandings and collisions, of principal concern here. These data have shown the following:

> Apart from massive structural failures which ultimately result in the total loss of loaded tankers, strandings contribute approximately one-third of the total oil outflow due to tanker accidents. Collisions on the other hand contribute only on the order of ten per cent of the total while occurring at the same frequency as strandings.
>
> For the handy-size (to 40 MDWT) and medium-size (40-150 MDWT) tankers, oil outflows (in terms of tons outflow per tons of deadweight in category) of 1.57 and 0.43 as compared to 0.24 for the VLCCs (150 MDWT and over) occurred. Moreover, when the tankers are considered above and below 70 MDWT, the smaller have oil outflows (per ton of deadweight) of over five times that from the larger tankers.
>
> Regarding the location of the polluting accidents, almost all occurred in harbours, entranceways, or coastal areas. The strandings occurred mainly in the harbours and entranceways, the most ecologically sensitive zones.

Thus, one can conclude that tankers less than 70 MDWT spill five times more oil as the result of accidents than their larger counterparts, per deadweight ton. Moreover, these spills occur for the most part within the ecologically sensitive zones.

<u>Mitigating the Effects of Tanker Strandings</u>

Table I shows 30 strandings which occurred within the navigable waters of the United States between 1969 and 1973 (the table was extracted from a study conducted quantitatively to examine the effectiveness of double bottoms in mitigating oil outflow from tanker bottom damage). Most of the information contained in Table I is self-explanatory.

The vertical damage recorded (the most important damage parameter) was that which extended from the base line to the uppermost replacement of material, rather than to the uppermost point of damage. In our view, all vertical damage indicated in Table I is therefore in excess to that which actually occurred.

TABLE I

| Casualty No. | Casualty Date | L x B x D | DWT TONS | Est. Speed Time of Cas. | OUTFLOW INFORMATION Amt(Tons) | Type | How Determ. | DAMAGE DESCRIPTION Length | Vert Ext | # of Tanks Breached | $ Est of Repairs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4-4-73 | 187x25.8x13.5 | 29371 | 9 KTS | 850 | Resid. | Reported | 116 | .8 | 6 | 1,500,000 |
| 2 | 3-7-73 | 154x20.6x12.2 | 17058 | 15 KTS | 650 | Fuel Oil & Resid. | Reported | 123 | 1.0 | 8 | |
| 3 | 12-29-72 | 66x13.1x4.3 | 1955 | 5 KTS | 14 | Fuel Oil | Reported | 1.0 | .3 | 1 | 5,000 |
| 4 | 12-5-72 | 193x25.6x14 | 33630 | 5 KTS | 450 | Resid. | Reported | 90.0 | 1.0 | 7 | UNKNOWN |
| 5 | 7-22-72 | 239x39x17.7 | 88072 | - | 3520 | Resid. | Reported | 142.5 | .3 | 1 | |
| 6 | 3-21-72 | 73.1x11.3x4.5 | 1450 | 9 KTS | 280 | Fuel Oil | Reported | 23.0 | 1.0B | 4 | 50,000 |
| 7 | 2-20-72 | 207x28.4x15 | 41208 | 6 KTS | 1 | Unk. | Reported | 13.5 | .3 | 2 | 30,000 |
| 8 | 1-20-72 | 196x25x14 | 32618 | 3 KTS | 200 | Fuel Oil | Reported | 12.2 | .5 | 1 | 25,000 |
| 9 | 1- 3-72 | 73.1x11.3x4.5 | 1450 | - | 1 | Fuel Oil & Resid. | Reported | 24.8 | .6 | 5 | 56,000 |
| 10 | 9-21-71 | 36x11 | 566 | 2 KTS | 17 | Gasoline | Reported | 29.8 | .6 | 3 | 75,000 |
| 11 | 8-17-71 | 45.5x8.3x3.3 | 651 | - | 5 | Gasoline | Estimate | .1 | .05 | 1 | 5,000 |
| 12 | 7-6-71 | 168x22.8x11.9 | 20752 | - | 21 | Fuel Oil | Reported | 6.0 | .3B | 1 | 10,000 |
| 13 | 6-12-71 | 238x39x17.1 | 79667 | - | 710 | Crude | Reported | 68.5 | 1.0 | 1 | 50,000 |
| 14 | 5-16-71 | 203x29.6x15 | 42885 | 11.5 KTS | 1 | Fuel Oil | Reported | 12.5 | .2 | 1 | 50,000 |
| 15 | 4-2-71 | 31.3x8.5 | 710 | - | 4 | Fuel Oil | Reported | 16.0 | .3B | 3 | 15,000 |
| 16 | 3-1-71 | 154x20.8x11.9 | 16590 | 14.5 KTS | 70 | Diesel Oil | Reported | 65. | .8 | 1 | 300,000 |
| 17 | 1-27-71 | 62.5x9.6x4 | 1025 | - | 1 | Fuel Oil & Resid. | Reported | Unk. | .2 | 1 | UNKNOWN |
| 18 | 1-23-71 | 208x28.4x14.9 | 39029 | 9.5 KTS | 1250 | Kerosene& Distillate | Reported | 125. | 1.5 | 6 | 230,000 |
| 19 | 12-21-70 | 55x9.1x4 | 650 | - | 1 | Fuel Oil | Reported | Unk. | .3B | 1 | 10,000 |
| 20 | 10-14-70 | 63x11.3x4.5 | 1300 | - | 1 | Fuel Oil | Reported | 4.3 | .1 | 1 | 51,000 |
| 21 | 7-27-70 | 160x20.7x11.4 | 18607 | - | 1 | Gasoline | Estimate | 20.0 | .3 | 1 | UNKNOWN |
| 22 | 7- 7-70 | 208x28.4x19.9 | 37029 | - | 750 | Fuel Oil | Reported | 122.0 | 1.35 | 2 | 500,000 |
| 23 | 4-26-70 | 170x24.4x10.9 | 24171 | - | 1 | Fuel Oil | Reported | 7.0 | .1 | 1 | 10,000 |
| 24 | 4-8-70 | 86x13.1x4.3 | 1955 | 4 KTS | 17 | Fuel Oil | Reported | 12.8 | .5B | 1 | 100,000 |
| 25 | 2-13-70 | 177x23.4x12.8 | 25010 | 8 KTS | 830 | Resid. | Reported | 105. | .2 | 8 | 50,000 |
| 26 | 1-7-70 | 76.5x10.4x5 | 1970 | - | 2 | Fuel Oil | Estimate | Unk. | .3 | 1 | 3.700 |
| 27 | 11-18-69 | 187x26.3x14 | 31619 | - | 1000 | Resid. | Reported | 5.5 | .3 | 1 | 100,000 |
| 28 | 3-9-69 | 183x25x12.8 | 28447 | 16 KTS | 1350 | Crude | Reported | 111. | 2.5B | 10 | UNKNOWN |
| 29 | 2-9-69 | 162x21.4x12.2 | 19070 | 8 KTS | 500 | Resid. | Reported | 80. | 1.8 | 8 | 750,000 |
| 30 | 1-2-69 | 137x19.5x10.6 | 12799 | 15 KTS | 1 | Fuel Oil | Reported | Unk. | .5B | 1 | UNKNOWN |

NOTES: 1. All length dimensions are in meters.

2. $ estimate of repairs is taken from CG-2692 and in some cases estimate is not consistent with the description of damage.

Nevertheless, as shown in Figure I, in twenty-seven of the thirty cases (90 per cent of the cases) the extent of vertical damage was less than 0.067B (B/15).

Figure II is a graph of the vertical extent of damage versus tanker deadweight. Figure II demonstrates that no correlation between the size of the tanker and the degree of vertical damage exists, contrary to what one might expect in a bottom damaging casualty.

From this information, the following conclusions may be drawn:

(a) If the thirty tankers had been fitted with B/15 double bottoms, twenty-seven of them would not have polluted. The double bottoms would have been effective in 90% of the cases. Furthermore, approximately 11,000 of the 12,499 tons of oil pollution or 87% of the pollution would have been prevented.

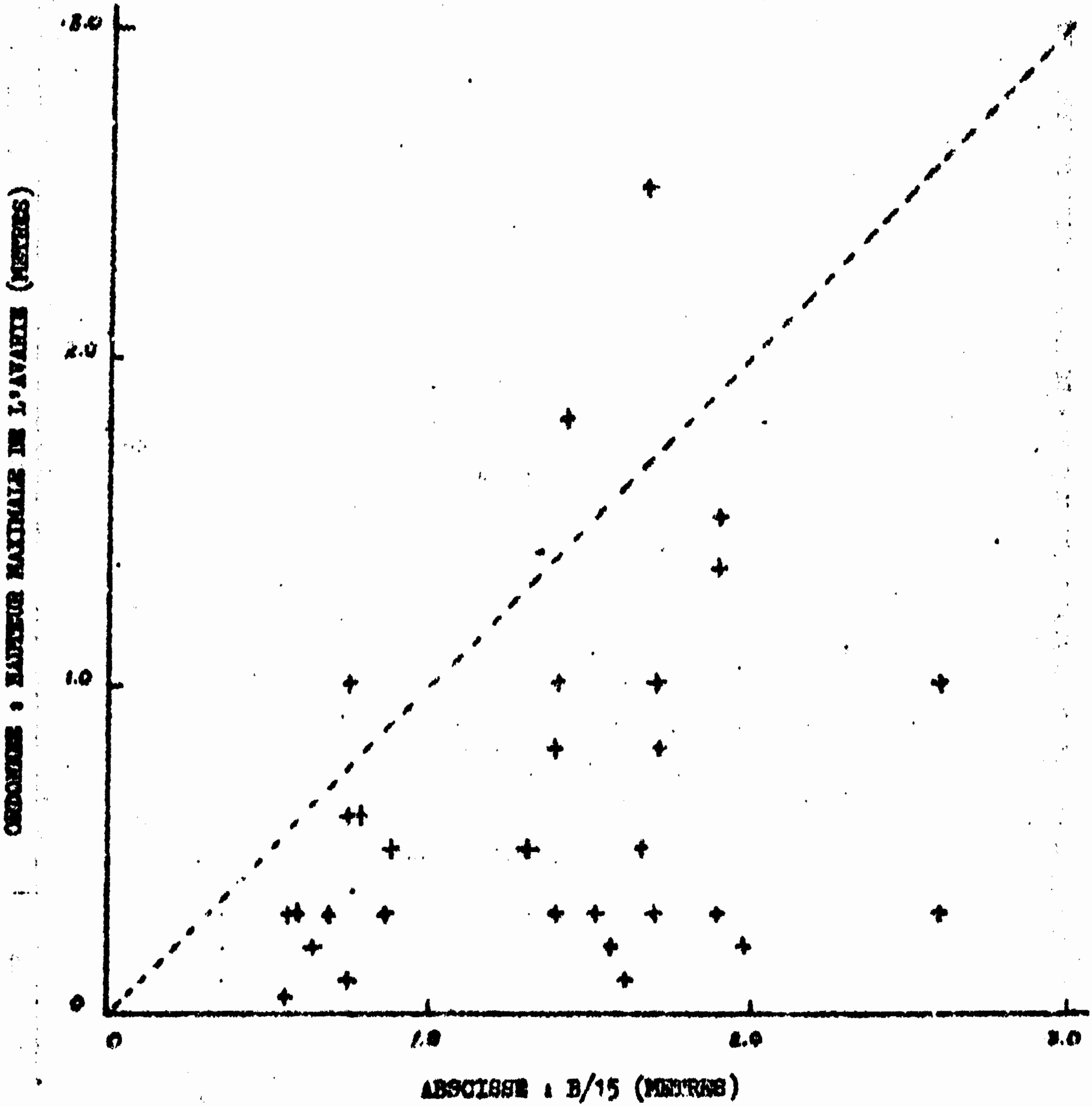
(b) If the thirty tankers had been fitted with 2.0 meter double bottoms, twenty-nine of them would not have polluted. The double bottoms would have been effective in 96% of the cases. Furthermore, approximately 11,550 of the 12,499 tons of oil pollution would have been prevented.

(c) The amount of vertical damage sustained by a tanker involved in a bottom damaging casualty is not related to the size of the tanker.

(d) In some bottom damaging casualties double bottoms would not prevent the tanker involved from polluting. However, in those cases the presence of double bottoms would reduce the amount of outflow as opposed to that from tankers not fitted with double bottoms.

The United States therefore submits for consideration by the Committee the following proposal for amendment to Annex I:

FIGURE I - HAUTEUR DE L'AVARIE EN FONCTION DE B/15



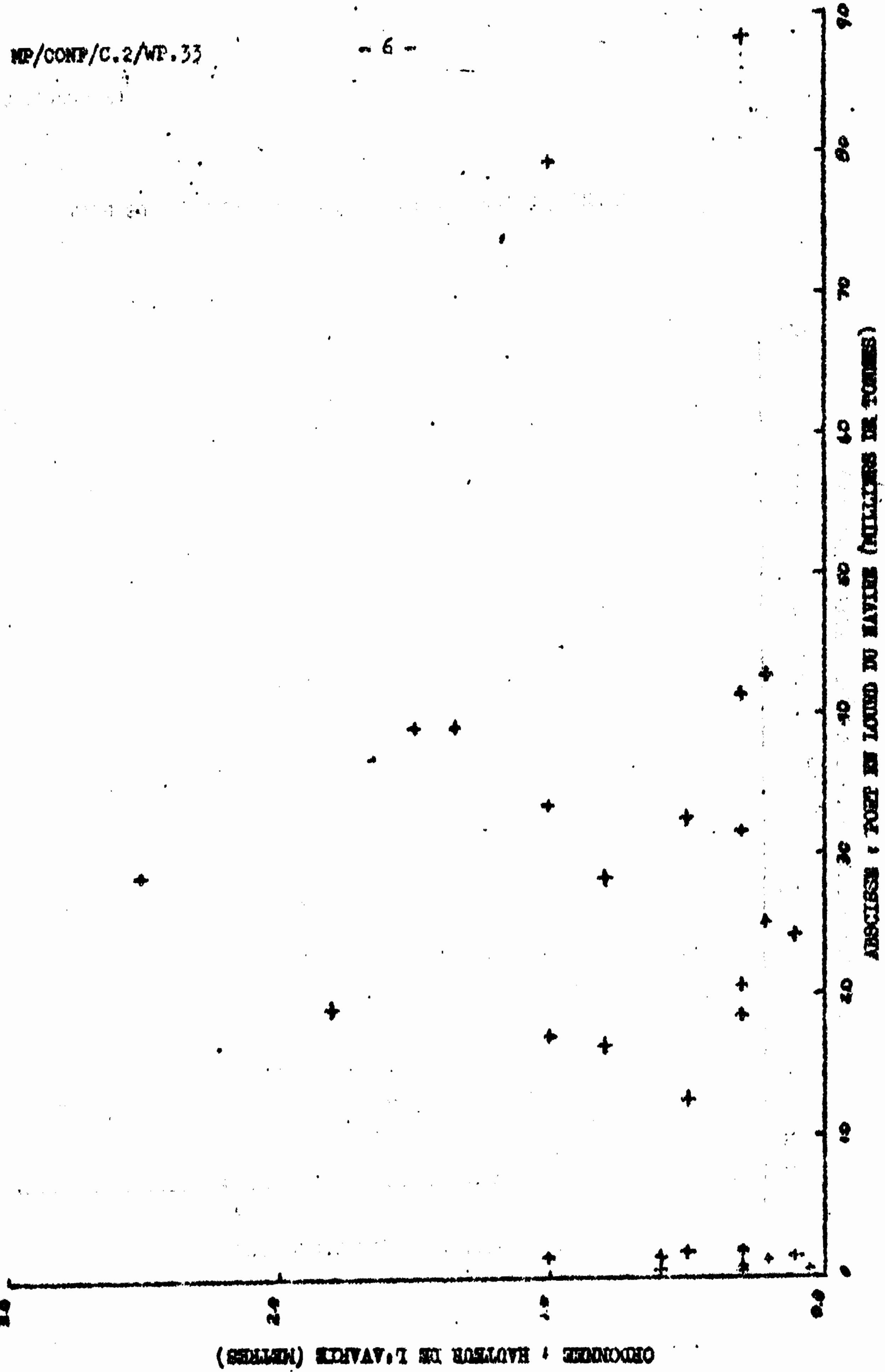



FIGURE II - HAUTEUR DE L'AVARIE EN FONCTION DE LA DIMENSION DU PETROLIER

Add new Regulation 27 to read as follows:

Regulation 27

Every new oil tanker (including combination carriers) of less than 70,000 tons deadweight shall be fitted throughout the cargo length (including pump rooms) with a double bottom of a height of B/15 or two metres, whichever is less. (Cargo oil shall not be carried in these spaces).

This regulatory scheme would essentially encompass all smaller tankers entering ecologically sensitive waters where traffic density, physical configurations, or weather factors combine to create a substantial risk of accident.