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FORMAL SAFETY ASSESSMENT

Information on the cost of oil spills in the United States' territorial waters

Submitted by the United States

SUMMARY

Executive summary:	This document provides information on the costs of oil spills in the United States. Based on United States data and supplemental literature review presented in MEPC 61/INF.11, the United States recommends that spill volumetric costs need to be increased from the valuation schemes currently proposed.
Strategic direction:	12.1
High-level action:	12.1.1
Planned output:	12.1.1.1
Action to be taken:	Paragraph 17
Related documents:	MEPC 55/18; MEPC 60/17, MEPC 60/WP.11 and MEPC 61/INF.11

Background

1 The Marine Environment Protection Committee, at its fifty-sixth session (9 to 13 July 2007) established a Correspondence Group to review the draft Environmental Risk Acceptance Criteria in annex 3 of document MEPC 55/18. The Group was to finalize the criteria for use in the IMO FSA Guidelines (MSC/Circ.1023-MEPC/Circ.392, as consolidated in MSC 83/INF.2). The Committee established a Working Group on the topic at its sixtieth session (22 to 26 March 2010).

2 MEPC 60/22, paragraph 17.8, urged Member Governments and Organizations to verify and adjust as necessary the proposed total spill cost formula and to submit the data for each cost component and the results of the analysis for consideration by the Committee.

Framework

3 The United States commends those Member Governments that have contributed to the Working Group. However, the United States believes that spill volumetric costs need to

be increased from the valuation schemes currently proposed by Greece, Japan and Norway. The United States compared its spill experiences to the predictions made by the three models previously mentioned and from its experience found that they significantly under predict the costs.

4 The United States view of the IMO Environmental Risk Evaluation Criteria (EREC) is that it provides a reference benchmark for environmental impacts. A requirement for such a benchmark is that it provides a full accounting of all the costs associated with a spill, as well as the valuation of those costs and impacts on society. Just as all costs of implementing a potential regulation must be considered, so, too, must all the benefits, including these avoided costs and their societal valuation.

5 Many studies look at only one cost component, or at most a small subset of all costs. Taking their results as indicative of total cost significantly underestimates the full impacts of oil spills. The overall spill avoided costs can be taken as the sum of the individual cost categories from Table 1. This framework is consistent with others including those of the International Tanker Owners Pollution Federation Limited (ITOPF) and those of the Working Group at MEPC 60 as illustrated in Table 2.

6 It should be noted that ITOPF acknowledges that the environmental damage costs are underestimates given payout restrictions, which include the International Oil Pollution Compensation Fund (IOPCF – the basis for the ITOPF data) being a secondary source of funding, and having restrictions on what IOPCF will fund.

Table 1: Spill Avoided Cost Categories

Category	Description
Response	Cost associated with containing, recovering, and cleaning spilled oil
Environmental Damage	Value of wildlife losses, ecosystem damage and other environmental impacts after response efforts are completed
Third Party Costs	Cost of impacts to parties not directly involved in the mishap, including lost use and delays/disruption
Damage to Vessel	Cost associated with repairs to vessel(s) involved in mishap
Legal Costs	Costs associated with legal awards for damages and/or other harms incurred
Value of Lost Oil	Economic value of oil lost in spill
Other	Other costs not captured elsewhere

Table 2: Comparison of Spill Cost Taxonomies

United States Category	MEPC 60/WP.11 Category	ITOPF Category
Response	Mitigating Costs/Preventing Measures	Preventive Measures & Cleanup
	Clean-Up Costs	
Environmental Damage	Environmental Damage	Reinstatement/Restoration of Environment
Third Party Costs	Property Damage	Property Damage
	Economic Losses	Economic Losses
Legal	Legal	
Value of Lost Oil		
Other		
Damage to Vessel		

7 The analysis in MEPC 61/INF.11, which focuses on volumetric estimates of avoided spill costs, the costs associated with vessel damage are excluded, as it is recommended that given their nature, such costs be accounted for in Formal Safety Assessments as a "per incident" cost. This was presented at MEPC 60 and is described in MEPC 60/WP.11.

Summary of the United States Analysis

8 Based on the United States data and supplemental literature review presented in MEPC 61/INF.11, the United States determined a best estimate (single point value) of approximately $ 100,000/metric ton for total cost per metric ton of oil spilled. Figure 1 shows the breakdown of costs by cost component.

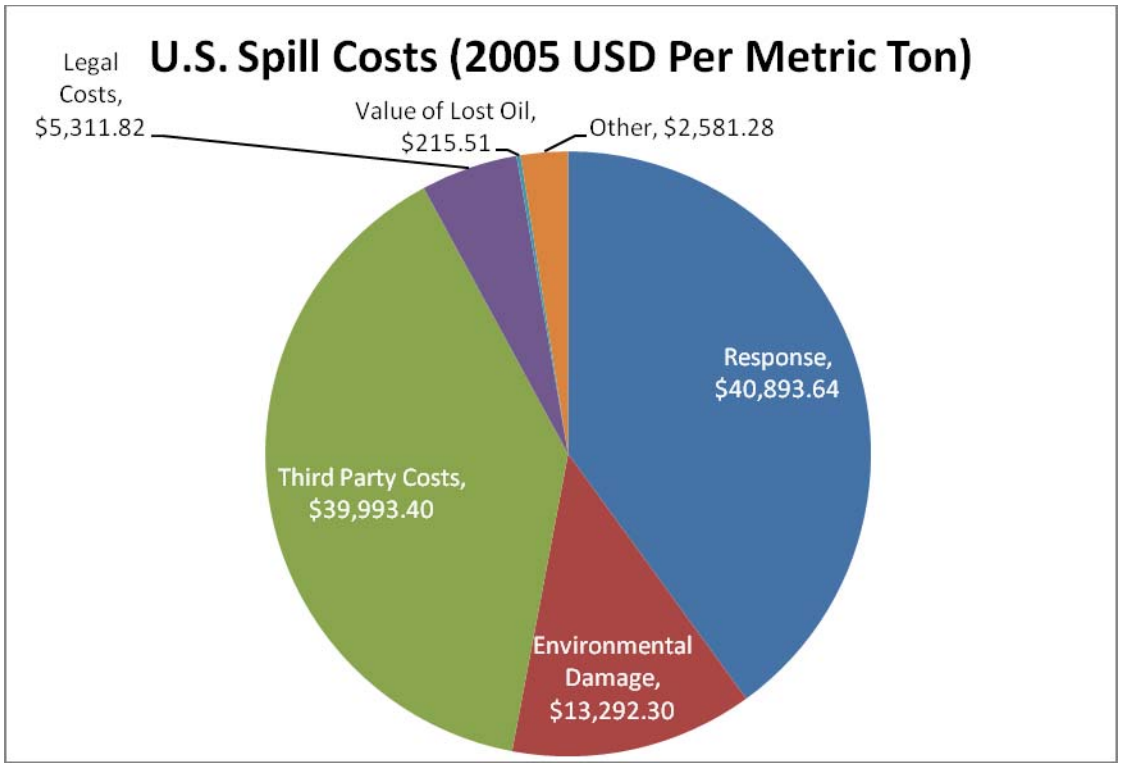

Figure 1: United States Best Estimate Total Spill Costs (approx. $ 100,000 USD/metric ton; in 2005 dollars)

9 The United States estimates are significantly higher than those recommended by other contributors to the Working Group. This is due at least in part to the more complete accounting of costs, including environmental damages, third party and legal costs. As an initial validation of the cost estimates (given the differences in sources for the estimates), the relative magnitude of the response costs versus other cost components can be used. Here, the expectation is that, on a volumetric basis, damages would be more expensive than response activities, given conventional wisdom and optimal resource allocation. This expectation is borne out in the estimate shown in Figure 1.

Proposal

10 The United States believes that spill volumetric costs need to be increased from the valuation schemes currently proposed by Greece, Japan and Norway. The United States compared its spill experiences to the predictions made by those models. Specifically, the best estimate cost from Figure 1 was applied to a range of spill volumes from 0 to 1700 MT, and compared to predictions from the three models. The results, shown in Figure 2, indicate that compared to the United States experience, the three models significantly under predict the costs.

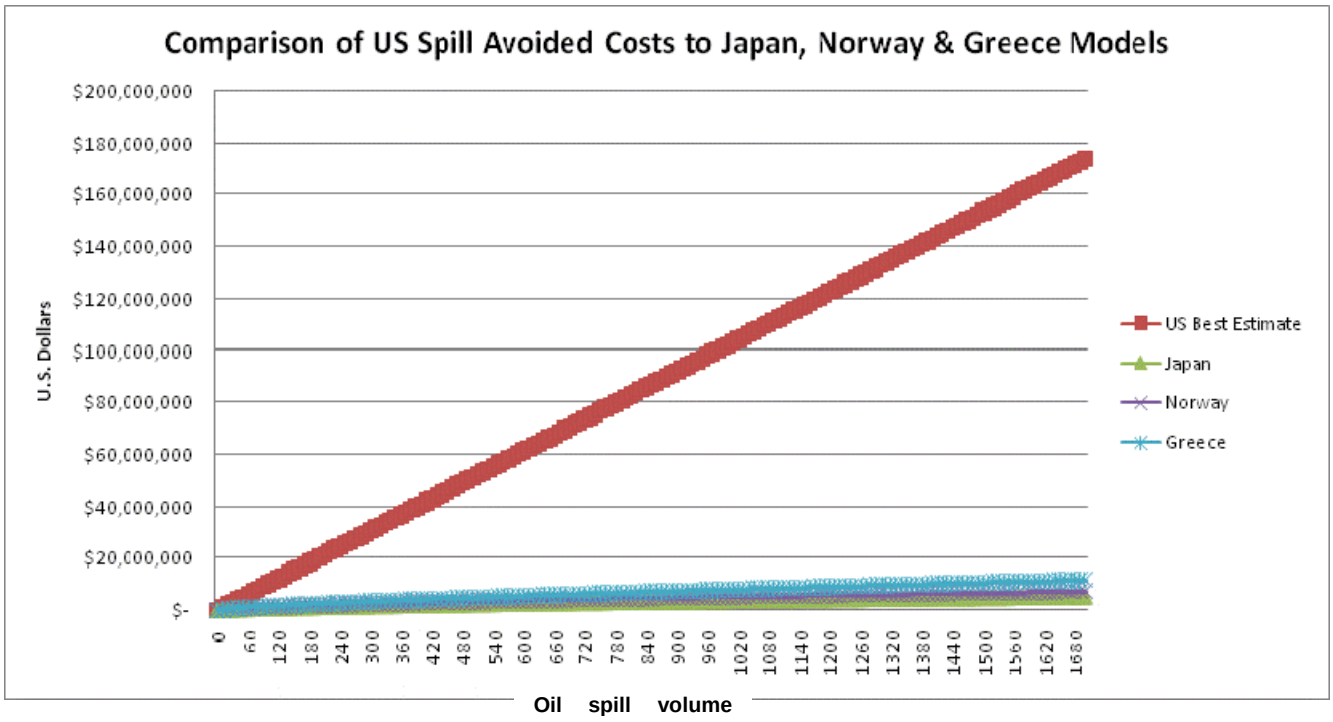

Figure 2: United States Spill Avoided Costs versus Japan, Norway and Greece Models

11 In addition, the predictions offered by the other cost models similarly undervalue significant historic spills, when compared to the United States experiences. The volume of an actual spill was used to determine predicted costs using the three models and the best estimate from Figure 1. These costs were then compared to actual documented costs, updated to 2005 USD. The results of this review are shown in Table 3. As can be seen, the United States experiences are reasonably representative of actual costs, and often underestimate the actual costs.

Table 3: Cost Projections for Historic Spills

Spill	US Best Estimate ($M)	Japan ($M)	Norway ($M)	Greece ($M)	Actual Costs ($M) (sources provided in MEPC 61/INF.11)
Valdez	$ 3,785	$ 40	$ 55	$ 109	$ 4,200
Berman	$ 247	$ 7	$ 9	$ 15	$ 228
Erika	$ 2,025	$ 27	$ 36	$ 69	$ 1,000
Prestige	$ 6,444	$ 57	$ 77	$ 160	$ 2,786 - $ 10,524
Bouchard	$ 32	$ 2	$ 3	$ 3	$ 38
Athos I	$ 88	$ 3	$ 5	$ 7	$ 113
Cosco Busan	$ 18	$ 1	$ 2	$ 2	$ 64 + environmental restoration (TBD)
Hebei Spirit	$ 930	$ 16	$ 22	$ 39	$ 2,305

12 To investigate the differences between the United States cost experience and the three currently proposed valuation schemes in greater detail, the response costs for the 486 spills were compared to the total cost from the three models. MEPC 61/INF.11 provides greater detail into the results of this comparison and the resulting under-predictions from the three proposed models, even though the actual costs as shown by the United States data are for but a subset of the total costs included in the three models. A summary of the degree of under-estimation is provided in Table 4.

Table 4: Spill Size Distribution and Frequency of Japan, Norway and Greece Model Underestimates

Spill Size (Metric Tons)	Number	Number of Spills with US Response Cost > Maximum of Model Estimates for Total Cost	Percent of Spills with US Response Cost > Maximum of Model Estimates for Total Cost
<7 MT	437	230	53%
7-700 MT	47	8	17%
> 700 MT	2	0	0%

13 As can be seen from Table 4, more than half of the small spills (<7 MT) had response costs higher than the total costs predicted by any of the three models (in this region, the model provided by Norway had the predictions closest to the United States experiences). While these may appear to be insignificant, and some may claim them to be operationally caused (e.g., loading and discharge spills) versus mishap caused (e.g., collision), the United States believes neither to be the case. First, while the majority of oil pollution has come from the very large spills (>700 MT), almost 10% has come from the small (<7 MT) spills United States Coast Guard, *Oil Spill Compendium 1973-2004*). Second, the consensus within the IMO discussions and in the scientific literature is that the volumetric cost for these smaller spills is higher than for the larger spills. Finally, for the data in the set used for this analysis, only a portion were operationally driven, even for the smaller spills, with the rest being caused by vessel mishaps.

14 Furthermore, while in general the three models predicted higher costs for the larger spills (7 MT and higher) than was incurred in the United States experience, of those where the models did not predict higher costs, there were some spill response costs approximately eight times that predicted by any of the three models (in this region, the model provided by Greece had the predictions closest to the United States experiences).

15 As to why the differences were found, one explanation could be in the source data utilized, with the models from Greece, Japan, and Norway, being based on International Tanker Owners Pollution Federation Limited (ITOPF) collection of International Oil Pollution Compensation Fund (IOPCF) data. First, as noted in MEPC 60/WP.11, ITOPF notes that the funds disbursed by IOPCF are below actual spill costs, in part due to the limitations on what environmental damages are paid, with claims having to satisfy "a number of criteria", including the ability to prove a monetary loss (and not a modelled loss) and "likely to enhance significantly the natural process of recovery". Second, ship owners provide the primary (initial) source of funding for spills. This results in funding of up to $135 million (US$) per spill coming from tanker owners (P&I Clubs), outside of IOPC Funds. It is believed that this primary source of funding may be another reason for the disparity in avoided cost estimates.

16 MEPC 61/INF.11 also provides comments on the societal valuation multiplier recommended by Norway (an "assurance factor" of 1.5), as well as initial thoughts on the ALARP region, frequency matrix and severity index, as noted in the report of the Working Group at MEPC 60.

Action requested of the Committee

17 The Committee is invited to note the work of the United States in this document and MEPC 61/INF.11 and consider this information in the development of environmental risk evaluation criteria.