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ARTICLE: Distant Past or Future Trouble? Redefining Customary Trade Allowance in Maritime Oil Shortage Claims

M. McCary*

* J.D., The University of Texas at Austin, 1999; B.A., Virginia Military Institute, 1992. For W.W.M., whose life on the high seas sparked the impetus for this project and whose wise counsel is always welcome.

SUMMARY:
... Though an explosion of cases regarding the once hotly contested customary trade allowance is not likely to occur, confusion over its terminology will probably bubble to the surface of a future court opinion. ... any clause, covenant, or agreement in a contract of carriage relieving the carrier or the ship from liability for loss or damage to or in connection with the goods arising from negligence, fault, or failure in the duties and obligations provided in this section or lessening such liability otherwise than as provided in this Act, shall be null and void and have no effect. ... Consequently, what has been considered a customary trade allowance should be more appropriately described as a simple cargo loss allowance. ... By replacing the customary trade allowance doctrine with cargo loss allowance terminology and a total facts and circumstances test courts can ensure consistency in future opinions. ... Instead of using customary trade allowance terminology, a court can state whether it is making a cargo loss allowance after examining all the facts. ... Customary trade allowance should, therefore, be redefined using simple cargo loss allowance terminology. ... Courts and arbitral panels should therefore move away from the outdated notion of customary trade allowance by replacing it with the clarity of a new test and incorporating simple cargo loss allowance terminology. ...

TEXT:
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Legal scholarship should promote rather than impede those market changes that will lead to improved technology and the modernization necessary to sustain a vibrant and healthy economy.

I. Introduction

Ship owners and carriers beware. Petroleum prices are on the rise. n1 Worldwide dependence on natural resources is climbing. n2 And with the increased costs of a barrel of oil come the watchful eyes of maritime cargo owners. A betting person would say it will not be long before courts and arbitral panels tackle yet another maritime oil shortage claim. Though an explosion of cases regarding the once hotly contested customary trade allowance is not likely to occur, confusion over its terminology will probably bubble to the surface of a future court opinion. Therefore, the legal community is **[*47]** wise to redefine this doctrine governing acceptable maritime oil loss levels.

Fifteen years ago the Third Circuit refused in Sun Oil Co. v. M/T Carlisle n3 to recognize a carrier's defense of customary trade allowance. n4 The concept of customary trade allowance, advocated by the defendant in Sun Oil as an implied contract term, once permitted almost without question a carrier's unaccounted-for loss of one-half of one percent of its bulk cargo (.005 or 0.5%). n5 But in Sun Oil, the Third Circuit declared that the customary trade allowance contravened policies outlined under the Carriage of Goods by Sea Act (COGSA). n6

Today courts and arbitral panels are slow to apply the customary trade allowance to shield a carrier's liability. n7 Yet ruling panels continue to get bogged down in the legalese and muddled concepts of previous opinions. n8 As history repeats itself, now is an appropriate time for the scholarly lighthouse to provide a beacon of **[*48]** clarification. A quick look at the impact of the customary trade allowance shows the importance of clarifying its terms.

Crude oil imports in the United States average approximately 8.2 million barrels per day (bpd). n9 At approximately 24 U.S. dollars per barrel in 1999, corresponding daily contract values for this amount range as high as $ 196.8 million. n10 Maritime shipping accounts for more than fifty percent of these U.S. crude oil imports. n11 Although any individual maritime shipment is only a small percentage of this total, aggregate transactions play an important role in ensuring economic stability and certainty in business relations. Consequently, the numbers themselves tell the tale. If a 0.5% maritime customary trade allowance was inherent to every maritime contract, as critics of the Sun Oil ruling claimed, n12 it could permit an unaccounted-for loss of more than 20,500 barrels per day-a potential contractual value totaling more than $ 492,000.

In light of today's sweeping high-tech developments and market awareness, any trade custom that advocates a potential lack of accountability for more than 20,000 barrels per day of U.S. oil imports must be clarified. n13 The legal framework governing petroleum transactions should be able to efficiently address the numerous issues arising from economic and technological changes in both the maritime and petrochemical industries. An efficient legal **[*49]** system cannot ambiguously address the terminology and concepts underlying the customary trade allowance.

This Article reflects on the Sun Oil decision and promotes clarity by advocating the replacement of customary trade allowance terminology with a total facts and circumstances test. It clears away the haziness surrounding the customary trade allowance doctrine by examining the historical evolution of the concept, discussing its application in other areas of trade, reviewing the modern developments in maritime cargo measurement, and examining some of the recent judicial and arbitral rulings. Together with a short analysis of contract clauses under contemporary charter party agreements, this Article justifies the reasoning behind the Sun Oil decision and argues that if courts and arbitral panels integrate "total facts and circumstances" terminology in future oil shortage claims, this will underscore the modern trends in oil shortage claims and sweep away the lingering judicial flotsam arising from previous discussions of customary trade allowances.

II. Historical Notes Regarding the Maritime Customary Trade Allowance

In the late 1850s American entrepreneurs began the race to discover, produce, and market oil resources globally. n14 As the industry expanded, various methods of exploration, production, and transportation evolved. Petroleum transactions gradually became more routine and businessmen became acutely aware of the impact petroleum measurement standards had on contractual profits. Oil producers initially addressed measurement inaccuracies by agreeing in 1866 to gauge oil measurement with a one-half of one percent (0.5%) allowance for spillage, evaporation, and measurement errors. n15 This measurement agreement is generally recognized as the origin of the standard barrel (bbl). For every 40 gallons of crude oil purchased, the buyer received 42 gallons. n16 As major oil traders, such as Standard Oil, increased their trade efforts worldwide, other **[*50]** areas of commerce, including maritime shipping, eventually made accommodations for petroleum measurement errors. n17

The emergence of modern commercial maritime transportation of oil first occurred in 1861 when a ship carried a cargo load of barrels across the Atlantic from America to England. n18 As competitors sought ways to enter new markets, they improved ship designs with more modern technological developments. n19 This led to vessels with hull structures specifically made to carry bulk oil products. These early vessels were the precursors to the subdivided double-hull structures of modern supertankers. It is generally accepted that the 0.5% trade allowance arose from the insurance industry's response to these early shipping technologies and problems arising from typical bulk cargo losses. n20 But modern standards of shipping have changed considerably in recent decades.

Today's double-hull bulk oil tanker typically weighs 280,000 deadweight tons (dwt) n21 and can carry a cargo of 2.2 million barrels of crude oil. n22 One-half of one percent (0.5%) of this ship's cargo load rounds out at approximately 11,000 barrels of oil. n23 A ship of such massive size might, of course, have difficulty out-pumping all **[*51]** of its cargo. n24 But carte blanche acceptance of the historical one-half percent trade allowance at a conservatively priced calculation of $ 20 per barrel would still result in an approximate cargo loss value of $ 220,000 for the shipper (cargo owner). n25 Just as industry standards change with technology, so must the law change to readdress evolving customs. n26

Amidst this setting, shippers, carriers, courts, and practitioners are wise to reexamine customary trade allowance. By flushing out the economic and policy considerations behind the customary trade allowance, it becomes apparent that courts have sought to maintain certainty in legal standards while balancing evidentiary concerns between shippers and carriers. Although the Third Circuit was not successful in clarifying all issues that might arise from cargo loss claims involving today's supertankers, criticism of its decision appears unwarranted.

III.Reflection on Judicial Precedent - Sun Oil Co. v. M/T Carisle

A. Case Background

More than twenty years ago, major oil producing nations banded together under the Organization of Petroleum Export Countries (OPEC) and slashed oil production, forcing an unprecedented rise in oil prices. n27 Crude oil prices per barrel **[*52]** rocketed fifteen-fold from less than $ 10/bbl to over $ 30/bbl. n28 As a result of this price increase, western oil companies found themselves reeling from rising product costs and inflationary turmoil. n29 For maritime traders, the value of precious bulk oil cargo tripled. n30 Where petroleum traders had relied primarily on profits from volume shipments, they soon became much more concerned with profits from individual transactions. n31

Courts and arbitral panels began seeing a rise in transactional disputes stemming from this crisis in the late 1970s. n32 Although the oil industry had recognized measurement errors since the early 1800s, traders and shippers began to question the validity of the one-half of one percent (0.5%) customary trade allowance as cargo values rose along with oil price increases during the 1970s and 1980s. n33 Consequently, the judiciary faced the significant challenge of reconciling commonly accepted trade practices with statutory constraints under COGSA in a volatile market climate. The Third Circuit was the first appellate court to rule definitively on the issue. n34

In Sun Oil, the plaintiff and cargo owner, Sun Oil Company of Pennsylvania, and its parent company, Sun International, Ltd., raised claims for a shortage in oil delivery against the carrier, M/T Carisle. n35 Sun Oil originally chartered the M/T Carisle to deliver a bulk cargo load of oil from La Skhirrah, Tunisia to Marcus Hook, Pennsylvania. The trip took a little more than 27 days. The M/T Carisle departed on October 13, 1980 from the warm berthing of the **[*53]** North African coastline destined for the cooler climate of the Eastern Seaboard of the United States. Upon its arrival on October 31, 1980, the M/T Carisle was measured to have 537,566 barrels of crude - approximately 2,835 barrels less than the original measurements of 540,401 barrels. In response to Sun Oil's shortage claims, the M/T Carisle argued the affirmative defense of customary trade allowance.

The Eastern District Court of Pennsylvania consolidated Sun Oil's claims with three similar cases the company had filed, and a panel of three judges ruled on the issue. After an evidentiary hearing, the district court, acting as the finder of fact on the issue of trade custom, found that the alleged custom existed. It then held that Sun Oil was only entitled to recover the amount of loss in excess of the 0.5% customary trade allowance. n36 The court granted summary judgment on behalf of the defendants, basing its decision on commonly accepted principles of commercial law found in the Uniform Commercial Code and the Restatement (Second) of Contracts. n37 The end result was that Sun Oil was to recover only the amount of loss exceeding 2,702 barrels - a paltry 133 barrels of oil. n38

Sun Oil appealed the district court's ruling and the judgment wound its way to the Third Circuit for review. n39 The Third Circuit recognized certain historic exceptions to carrier liability that underlined previous cargo loss rulings. n40 The court also acknowledged that maritime law would typically incorporate general **[*54]** principles of commercial law. n41 The Third Circuit, however, ruled that customary law could not stand if it is inconsistent with the policies behind COGSA. n42 Specifically, where a contract term - express or implied - is found to limit the liability of the carrier, it is to be considered null and void under COGSA section 3(8). n43

The Third Circuit also found the district court's ruling problematic with regard to the proper placement of the burden of proof. n44 The district court's ruling required the shipper, Sun Oil, to show the specific cause of the loss, but the Third Circuit interpreted COGSA as placing the burden of proof on the carrier, as the defendant, to justify unexplained losses. The Third Circuit implied that the district court's approach did not recognize the difficult, if not impossible, burden that a cargo owner would carry because some information would exist solely in the possession of the carrier. n45 By interpreting the burden of proof in this manner, the Third Circuit refused to accept claims that the customary trade allowance should constitute an affirmative defense. n46

One of the three circuit court judges in the Sun Oil case dissented in the 2-1 decision that reversed and remanded the district court's summary judgment ruling. Judge Hunter, the sole dissenter, characterized the customary trade allowance not as a "loss," but rather as an "allowance" for inaccuracies in measurement. n47 The majority dismissed this distinction, emphasizing the district court's characterization of the issue as a "customary transit loss allowance." n48 By resting its decision on the policies behind COGSA, the majority emphasized that the defendant would still have the "opportunity" to justify unexplained losses but would have to carry the "burden" of showing that the shortage in delivery was due to one of the statutory exceptions outlined by the Rights and Immunities Section of COGSA. n49

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1. COGSA Policy Implications

The Sun Oil ruling evinces a decision based on two-pronged reasoning. In the first prong, the majority interpreted COGSA broadly. It ruled that the Legislature had spoken on the issue of cargo liability and that a carrier could not contractually limit its liability by either express or implied contract terms. n50 This reasoning rested in COGSA, section 3(8). Section 3(8) explains that

any clause, covenant, or agreement in a contract of carriage relieving the carrier or the ship from liability for loss or damage to or in connection with the goods arising from negligence, fault, or failure in the duties and obligations provided in this section or lessening such liability otherwise than as provided in this Act, shall be null and void and have no effect. n51

The second prong involved burden of proof issues. In addition to countermanding the district court's interpretation of the customary trade allowance, the Third Circuit directed the carrier to shoulder the burden to prove it had not acted negligently if the plaintiff proved an unexplained loss. n52

2. COGSA Burden of Proof Issues

The emphasis the Third Circuit placed on burden of proof issues was aligned with the policy concerns underlying COGSA. The Third Circuit maintained that the district court's reasoning upset the COGSA statutory scheme by failing to recognize the carrier's burden of proving it was not negligent. n53 The Third Circuit required a showing that either there was a no-fault cause of loss in spite of due diligence or the cargo shortage fell into a statutory liability exception. n54 This approach is rooted in COGSA section 4(1): "Whenever loss or damage has resulted from unseaworthiness, the **[*56]** burden of proving the exercise of due diligence shall be on the carrier or other persons claiming exemption under this section." n55

By comparison, the district court elevated the apparent tradition of customary trade allowance to the level of statutory authority. Its method of interpretation incorrectly bypassed the burden of proof scheme outlined in COGSA, section 4. It also discounted the legislative history underlying the purpose of the section.

Sun Oil critics have claimed that the district court's reasoning correctly addressed customary trade allowance issues, but they failed to reconcile the fact that in any given situation a 0.5% loss is likely attributable to the carrier's or shipper's own negligence. n56 By using this reasoning, the district court allowed the carrier to prove the existence of a historically recognized trade custom rather than carry an appropriate burden of proving either that the loss did not occur due to negligence or that a statutory exception existed for "wastage in bulk or weight or any other loss or damage arising from inherent defect, quality, or vice of the goods." n57 Some confusion still arises over these burden of proof issues in today's cases and arbitral rulings. n58

B. Case Legacy

There have been relatively few court cases that have re-addressed the issue of customary trade allowance since the Third Circuit's ruling in Sun Oil. Courts that have revisited the issue have reconciled the trade customs found in bulk shipping by analyzing the **[*57]** "total facts and circumstances" surrounding the case. n59 They have continued to place heavy emphasis on the policy considerations underlying the Third Circuit's opinion and have been prepared to utilize the Sun Oil ruling to justify striking contract clauses that might limit the carrier's liability. n60

Arguments for 0.5% loss exemptions are also found in maritime arbitration rulings. Though arbitrators have infrequently cited Sun Oil, they too have focused on the total facts and circumstances of particular shortage claims much like their judicial counterparts. n61 Since the Sun Oil decision, there seems to be a general trend in both forums toward reviewing all elements that may result in an unexplained shortage of oil before applying any exemption for customary trade allowance.

1. Litigated Decisions

Of the nine cases examined involving customary trade allowance claims arising since the Sun Oil ruling, roughly half dealt with the bulk transportation of petroleum. n62 Most rulings, such as S.T.S. International v. M/V Michael C., n63 only skirt the issue of customary trade allowance. The courts in these cases have looked at **[*58]** all the facts and circumstances before seeking to apply any adjustment for normal in-transit losses. n64 They have sought to balance all of the facts in order to ensure that all "the pieces of the puzzle seem to fit together." n65

In weighing the facts of any particular case, most courts that have revisited the customary trade allowance issues have focused on the potential causes for loss that may have contributed to the shortage. Where the carrier's faulty handling or negligence contributed to the in-transit loss, the courts have sought to avoid declaring an exemption for customary trade allowance. n66 On the other hand, where the action or omission of cargo owners or shippers contributed to the mishandling or erred measurement of the cargo, the courts have been reluctant to hold the carrier liable. n67 The general rule that has surfaced is that the carrier is responsible for segregating the losses it caused from those losses that were either unavoidable or due to the shipper's action or inaction. n68 Recent arbitration cases seem more convoluted in their discussions but tend to exhibit similar reasoning and analysis.

2. Arbitral Rulings

Arbitral rulings on cargo loss allowance appear to be closely in step with litigated decisions. For example, in the arbitration matter of Georiandis Navigation, Inc. v. Mobile Shipping, n69 one of **[*59]** the first documented arbitral rulings after Sun Oil, the panel looked to all facts and circumstances to determine whether and to what extent the vessel owners were liable for loss. n70 After determining that a shortage in delivery of Arab crude resulted from delays and temperature changes that were not the fault of the defendant, the panel then looked to normal industry expectations to determine whether the losses were acceptable. n71

The approach taken by the Georiandis Navigation panel is consistent with more recent arbitral rulings. n72 As in the litigated cases, arbitral panels have ruled against limiting a carrier's liability through principles of customary trade allowance when the carrier's failure to appropriately handle or measure the cargo resulted in the loss. n73 The predominant view among arbitral panels appears to be that the 0.5% customary trade allowance figure is an arbitrary device taken from the distant past. n74 However, arbitrators still consider granting a cargo loss allowance for shortages inherent to petroleum shipments, but they pay particular attention to each element that may be the cause of an unexplained loss. n75 Given the frequency in which the same experts serve as arbitrators in multiple rulings, n76 one can expect future arbitral rulings to lead to even more consistent application of the total facts and circumstances test.

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IV. Statutory Validity of Customary Trade Allowance

Critics initially hounded the Third Circuit decision as one that disregarded commonly accepted precepts of commercial law and placed an unwarranted burden on carriers. n77 They made the arch-typical claims that the Sun Oil decision would project uncertainty into this area of the law and open the doors to needless litigation. n78 In spite of these comments, both courts and arbitral panels appear to be following the burden of proof scheme mandated by the Third Circuit. In retrospect, many of the factors considered in today's oil shortage rulings were present in literature during the time of the Sun Oil ruling. n79 Past critics of the Sun Oil ruling failed, however, to address the works of their fellow contemporaries and neglected to examine the legislative history. n80

Although critics argued that trade custom and usage were completely consistent with COGSA, they overlooked the fact that COGSA section 4(2) already incorporated the very principles to which they were aspiring. n81 This provision specifically addresses **[*61]** trade customs and contains a particular statutory burden of proof scheme. n82 Consequently, the Third Circuit did not discount the importance of trade customs but merely legitimized the legislative structure under which they were to be applied. A simple review of the legislative history behind COGSA and the Hague Rules indicates that the critics of Sun Oil built their arguments on sand.

A. Legislative History of COGSA

Research about the legislative history of COSGA shows that architects of both the Hague Rules and our modern statutory scheme were well aware of the potential for unexplained loss and leakage in bulk cargo shipments. n83 In fact, the provision that accounts for these concerns appears to be one of the least disputed and most widely accepted precepts of COGSA. n84 The relevant section is COGSA section 4(2)(m), which deals with "wastage in bulk" and "inherent defects." n85

Legislative officials from around the world were unified in recognizing the need to account for unexplained losses of bulk cargo and in ensuring the incorporation of bulk shipment provisions into **[*62]** the modern Hague Rules. n86 Nowhere in their discussions does it appear, however, that they sought to relieve the carrier from its burden of proving that cargo was handled in a non-negligent manner. n87 With this backdrop, it is difficult to accept criticism of the Sun Oil ruling. The statutory provisions of COGSA section 4(2)(m) encompass these trade customs and exhibit the intent of the drafters to place the burden of proof on the carrier to show that a loss fell within an acknowledged exception.

One could argue that the carrier in Sun Oil proved the widespread use of the customary trade allowance and that the loss therefore automatically fell under the section 4(2)(m) exception. This, however, was not the argument the defendant made. n88 In fact, the appellate court recognized that the carrier brought forth no evidence of due diligence and no evidence that the loss fell into the proper COGSA section 4(2)(m) exception. n89 Rather, the carrier sought to escape liability by arguing that the shipper had to prove the loss exceeded 0.5% before this claim could be considered. n90 Acceptance of the carrier<acute>s argument would inappropriately relieve the carrier from proving it was not liable for cargo losses even if the losses far exceeded industry norms.

B. The Dichotomy of COGSA: Liability v. Inherent Defect

Many courts, arbitral panels, and critics have had problems resolving COGSA's dichotomy of liability and inherent vice issues. The difficulties they have faced stem largely from their failure to discern the fact that drafters of COGSA recognized the inherent problems of transporting bulk cargoes but never intended to place an arbitrary number on the losses of bulk shipments. n91 Rather, COGSA's scheme allows both the carrier and shipper a chance to place the question of loss in a factual setting and in the oft-referred- **[*63]** to evidentiary "ping-pong" match. n92 In this match, a carrier relying on the "inherent vice" exception may show that the loss of cargo resulted from the cargo's character and is therefore within commonly accepted norms. The shipper, however, is free to refute this evidence and should be presented with the opportunity to address what amount is considered a normal cargo loss allowance. n93

Some opinions that have validated the customary trade allowance doctrine - including the ruling by the Eastern District Court of Pennsylvania in Sun Oil n94 - misinterpr et the purposes behind COGSA's statutory structure. n95 They fail to acknowledge that the statutory scheme already accounts for cargo loss allowances. Unfortunately, this approach inappropriately bypasses concerns arising from the carrier's historic ability to limit its liability with no recourse.

C. Customary Law and Analogous Cases

Arguments against application of the customary trade allowance doctrine can also be based on judicial decisions and arbitral rulings that apply flawed reasoning in cases dealing with cargoes other than oil. In fact, some decisions advocating a customary trade allowance in oil shortage cases have sought to utilize precedents set forth in cases dealing with cargo other than petroleum. n96 It is difficult to understand how courts and critics have supported their reasoning without addressing the fact that many different bulk cargo types have unique characteristics that could contribute differently to cargo shortages. It is even more perplexing to note that in cases involving solid cargoes, some courts and **[*64]** arbitrators have continued to apply the 0.5% customary trade allowance without addressing the characteristics of specific cargo types. n97

The logical inadequacy of applying the same 0.5% customary trade allowance to cases dealing with distinctly different cargoes appears to defy a more common-sense approach. Instead of looking at the raison d'etre of the legal principles behind the case, ruling officials have propagated flawed analyses by improperly using "cut and paste analogies" to defend legal decisions that may be better supported by arguments involving laws of physics and nature. n98 Since petroleum products themselves have distinct characteristics which lead to differences in fall-out, precipitation, evaporation, and clingage, it would seem appropriate to look toward the total facts and circumstances of a case before accounting for a measure of loss that limits liability.

D. Comparative Comments

Although this Article does not undertake an in-depth analysis of foreign cases, it should be noted from both the legislative history of COGSA and English cases that the problems inherent to bulk shipping are recognized throughout the world. Although few English cases were analyzed, those reviewed closely followed the reasoning of a ruling by the Queen's Bench in Amoco Oil Co v. Parpada Shipping. n99 The Amoco Oil decision included a thorough analysis of all the elements that might contribute to an oil loss. n100 The court also adeptly discussed issues concerning burden of proof and loss allowance. n101 In doing so, it exhibited the American trend of examining the total facts and circumstances before applying any adjustment for unexplained loss.

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E. Total Facts and Circumstances Test v. 0.5% Customary Trade Allowance

Given the weight of contemporary judicial authority against arbitrarily accepting a 0.5% customary trade allowance, arguments posited by critics of Sun Oil may no longer be viewed as persuasive. Though critics claimed that the concept of customary trade allowance is not fault based and therefore is reconcilable with the statutory provisions of COGSA, n102 fault issues do arise when a carrier seeks to exculpate its liability on the basis of the customary trade allowance doctrine. n103 Shippers must therefore be afforded the opportunity to challenge claims of customarily accepted industry standards that would otherwise hinder delivery of a full and complete shipment of cargo. The Sun Oil analysis exhibits the proper shift in burden of proof from the shipper to the carrier and back again. n104 That analysis provides a clear outline of proper evidentiary standards and is supported by an examination of the COGSA drafters' intent.

Another cleft in the deceptive arguments posited by critics of the Sun Oil ruling is their failure to note that acceptance of the district court's opinion would have prevented or at least slowed the number of challenges to deep-rooted industry standards even when market factors warranted change. n105 Thus, carriers could remain positioned behind their own shield of liability so long as their experts could provide persuasive evidence that the maritime industry recognizes a 0.5% customary trade allowance. The inequity of this position is self evident.

[*66] The district court in Sun Oil presumed that a 0.5% customary trade allowance existed because Sun Oil attempted to negotiate the incorporation of a lesser 0.25% customary trade allowance standard in its charter party agreement. n106 But the district court and its supporters failed to recognize that the company's inability to acquire this clause resulted from the carrier's overbearing bargaining power, which COGSA was designed to prevent. Other courts have correctly interpreted COGSA to require the carrier to satisfy its burden by showing that it was not responsible for the loss, rather than proving the mere existence of an industry standard in its favor. n107

Finally, critics of the Sun Oil decision avoided addressing the works of prominent commercial experts of their day. n108 In doing so, they neglected the importance of promoting legal precepts that encourage accountability, efficiency, and modernization in business transactions. The importance of promoting these traits becomes apparent in reviewing the technological improvements of modern petroleum shipping. A review of modern maritime trends shows the necessity of examining the total facts and circumstances behind an oil loss claim before an assessment can be made about the carrier's liability and whether a cargo loss allowance should be granted.

V. Present Day Necessity of Customary Trade Allowance

Both courts and commercial experts still ascribe the need for granting some cargo loss allowances as a result of the inherent qualities of petroleum that contribute to both real and apparent losses during transportation. n109 Their only mistake is in basing this analysis on the outdated concept of customary trade allowance. Since some losses are unavoidable, it is necessary for both courts and traders to take cargo characteristics into account when considering business claims. When shortages are above the "norms," either the cargo **[*67]** owner or the carrier may be at fault. Consequently, what has been considered a customary trade allowance should be more appropriately described as a simple cargo loss allowance. Past application of the 0.5% customary trade allowance doctrine should be considered merely an analytical benchmark for judging the proper amount of legal accountability that should be upheld by the law.

Since claims for petroleum shortage in maritime cases ultimately turn on factual evidence, courts have outlined potential reasons for shortage claims and sometimes have described the claims as either known or unknown losses. n110 It appears, however, that in the present era both courts and commercial specialists have a fairly good understanding of what factors contribute to any particular cargo shortage. n111 With this in mind, it is perhaps time for courts and arbitrators to realize that the causes behind any particular petroleum shortage claim can be reasonably ascertained. Although tables, radar, ultrasonic technology, and modernization of both procedures and equipment may not help cargo owners, lawyers, and judges correctly attribute the reasons behind the shortage of every barrel of liquid cargo. These advances can help lead to a fairly good estimate in any particular case.

Before considering if a cargo loss allowance should be granted, courts must assess the various factors potentially contributing to a cargo shortage claim, including the following: n112

(A) Measurement Errors (common - ullage n113 is known to be inherently inaccurate);

(B) Theft (infrequent);

(C) Leakage (uncommon - improved safety standards in modern shipping);

(D) Evaporation (common - affects most petroleum/liquid cargoes);

[*68] (E) Dumping or Ballasting (common - cargo outpumped along with wastewater); n114

(F) Burn Off (uncommon - burning cargo as fuel);

(G) Remainder on Board (ROB) (common - most cargoes can not be fully offloaded); n115

(H) On Board Quantity (OBQ) or Sludge (common - leftover coagulated cargo in hull); n116

(I) Bulk Sediment and Water (BSW) (common - similar in affect to OBQ or sludge);

(J) Free Water (common - water in tank will displace cargo and affect measurement);

(K) Temperature Changes (common - different temperatures will cause shrinkage);

(L) Vessel Experience Factor (VEF) figures (common - each ship has its own loss characteristics, and shipments and cargo losses can be tracked and analyzed through a VEF figure which provides a better indication as to whether or not any given loss is above norms); n117

(M) Conversion Tables (common - regularly updated, but sometimes inaccurate or misinterpreted);

[*69] (N) Distinct Cargo Characteristics (common - different cargo types have different cargo characteristics that affect other loss factors such as clingage, leading to quantity of cargo as remainder on-board, evaporation rates, and temperature conversion);

(O) Line Handling/Pump Procedures (common - adjustments must be made for the quantity of oil that may be in on-load or off-load lines and for care in pump procedures, and past measurements errors have often arisen due to the lack of such adjustments or failure to properly maintain sealed ventilation during pumping procedures).

Over time these factors have been the basis for cargo losses and measurement inaccuracies of anywhere between 0 and 0.5%. n118 Repeatedly, both experts and ruling authorities have agreed that some loss will inevitably occur in oil during loading, transportation, and unloading. n119 It would, however, be erroneous to state that a shortage will always occur at or near 0.5%. In fact, the majority of research now indicates that average losses are closer to what Sun Oil argued in its original case - somewhere around 0.25%. n120 This drop in oil loss estimates may not appear significant, but its effect on aggregate claims is enormous. In all probability, technological improvements and procedural awareness are the primary reasons behind the noted differences in loss percentages.

A. Measurement Technologies

Modern petroleum cargo and storage measurements are taken through a variety of means. n121 Measurements are still routinely taken before loading, after loading, during transit, prior to discharge, and after discharge; however, contemporary carriers and shippers may **[*70]** not rely strictly on the historically manual means of cargo measurement - or ullage. n122 In fact, the era of electronic and computer technology has descended on maritime shipping with full force. n123

Many carriers are now able to utilize multiple systems of measurement, ensuring both accuracy and redundancy in transfer calculations. n124 Although manual ullages are still used, carriers and shippers more frequently utilize a wide variety of automatic tank gauges (ATGs), including float-operated tank gauges, servo-operated tank gauges, radar tank gauges, hydrostatic tank gauges, smart cable tank gauges, and hybrid tank gauges. n125 Computer software to analyze shipments, similar to that which Sun Oil ostensibly used when presenting its case before the Third Circuit, is now widely available. n126 Additionally, most major oil companies maintain oil loss working groups created to track average losses in order to prevent shortage claims and promote transactional accuracy. n127 It appears these modern improvements in technology and management techniques have helped reduce the uncertainty of petroleum measurements and have halted the precipitation of oil-shortage claims.

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B. Cargo Handling Procedures

The rapid oil price increases of the 1970s and 1980s not only affected bulk oil measurement technology but also had a direct impact on management initiatives and cargo handling procedures. As both shippers and carriers became more concerned about cargo accountability, advances arose in oil wash procedures, n128 line transit checks, n129 and ventilation systems. n130 Additionally, pumping and discharge procedures received and continue to receive increased scrutiny. n131 Sloppy discharge techniques that were designed by carriers to improve the speed of cargo off-loading and vessel out-turns, despite their aggrandizing effects on petroleum vaporization, have been highlighted as problems by previous maritime experts and have been curtailed by environmental awareness. n132 Furthermore, industry organizations such as the American Petroleum Institute (API) now regularly update temperature and conversion tables that previously contributed to oil loss shortage claims. n133

C. Economic Considerations

It might be a stretch to say that the Sun Oil ruling was the decisive factor leading to many of the improvements in the maritime industry. But even if it was not such a catalyst, the ruling certainly **[*72]** promoted increased awareness and emphasis on economic accountability. n134 In searching for the correctness behind a legal rule, these considerations are often acclaimed. n135 Only rarely, however, does the legal community receive such a clear example of the effects a ruling may have in promoting industry improvements and environmental awareness.

In an era when environmental disasters such as the Exxon-Valdez spill have helped spotlight the necessity of ensuring that the maritime industry maintains the highest standards of safety in cargo handling and transportation, n136 it seems only appropriate that courts and arbitral panels apply a rule advocating heightened cargo handling standards. Just as litigation over the Exxon-Valdez spill led to improvements in environmental legislation, n137 double-hull tanker designs, n138 and vacuum storage technology, n139 litigation over oil shortage claims can be attributed to the improvements in accountability for bulk cargo shipments. From this angle, Sun Oil appears to live on as an appropriate policy mandate for preventing the automatic limitation of a carrier<acute>s liability.

Sun Oil's true legacy rests, however, in assuring that all factors of potential cargo loss are considered when examining an oil shortage claim. The total facts and circumstances approach to examining shortage claims provides a necessary check on industry standards that helps to promote economic accountability and modernization. By replacing the customary trade allowance doctrine **[*73]** with cargo loss allowance terminology and a total facts and circumstances test courts can ensure consistency in future opinions. Though the Third Circuit did not make such clear distinctions when it reviewed customary trade allowance concepts, the court should be applauded for making a decision that rested on the economic policies the total facts and circumstances test promotes.

VI. Trade Allowance - A Question of Liability v. Damages?

After noting that shipments of petroleum do have some margin for loss, there must be some discussion as to how to incorporate those trade standards into a legal structure that is best suited to promote market and economic improvements. With regard to the concepts behind the customary trade allowance, this becomes a discussion of what rule to apply. Specifically, it is a question of whether a customary trade allowance should be applied in the analysis of liability or damages. From previous court rulings, it is apparent that the real concern is liability, but a cargo loss allowance can be granted for inherent shortages occurring within industry norms.

In Sun Oil, both the district and appellate courts considered the customary trade allowance as an issue of liability - but they differed in their interpretative approaches. The district court required a showing that there was a loss of over 0.5% before allowing the claim to go forward against the cargo carrier. n140 By comparison, the appellate court, though not specifically stating it was doing so, determined that the total facts and circumstances of a case must be analyzed before a cargo loss allowance could be considered. n141

As has been shown, all the factors that possibly contribute to a shortage claim must be taken into account to reach the correct result in a petroleum shortage case. Only after the court or panel determines the amount of cargo loss a carrier is liable for can it **[*74]** properly determine the amount of damages. But instead, some courts and panels have utilized concepts of the customary trade allowance as a damage offset. n142 By using an offset, the court only holds the defendant liable for the amount of unexplained loss adjusted by a customary trade allowance percentage. It seems inappropriate to hold a carrier liable for the entire loss when some loss is considered inevitable. On the other hand, it seems just as inappropriate to exculpate a carrier from liability if the carrier has failed to meet its burden of proving it should not be responsible for the unaccounted-for loss.

The better approach, then, is to determine to what extent the carrier is liable and then adjust the damages according to the estimated inevitable loss of any particular case. Instead of using customary trade allowance terminology, a court can state whether it is making a cargo loss allowance after examining all the facts. If appropriately applied, this analytical approach would account for each individual factor potentially contributing to an oil loss claim.

VII. Redefining Customary Trade Allowance

In assessing liability issues, courts and arbitral panels have often exclaimed their frustration with available definitions of customary trade allowance. While courts once referred to customary trade allowance as a flat 0.5% allowance for unavoidable losses, the courts now appear to prefer a total facts and circumstances test. n143 Consequently, ruling authorities tend to base simple cargo loss allowances on outdated customary trade allowance terminology after making an assessment of individual vessel experience factors and likely conditions that could contribute to cargo shortages on any particular vessel. n144

[*75] The Third Circuit, therefore, got it right. Strict application of a 0.5% customary trade allowance offset tends to neglect some of these individual factors. That approach is neither in line with COGSA's intent to promote due diligence, nor with traditional contract analysis calling for parties to mitigate damages. n145 A carrier should not be able to escape liability for damages just because it proves there is an industry custom. Instead, the carrier should be required to carry the burden of showing to what extent it should not be held liable in any particular case. This approach provides carriers with an impetus for maintaining the highest standards of measurement and care for their cargoes and for improving and modernizing the technology of their fleet.

The difficulty in cargo loss claims rests in defining just what customary trade allowance is - and what it should be in light of changing market conditions and technological improvements in the maritime industry. Moving from what it is not (a 0.5% arbitrary allowance) to what it could be (a sliding calculation somewhere between zero and 0.5% for unavoidable losses occurring despite the exercise of due diligence by both cargo owners and carriers) requires considerations of total facts and circumstances. Customary trade allowance should, therefore, be redefined using simple cargo loss allowance terminology.

An appropriate cargo shortage allowance is one made for an amount of cargo deemed within acceptable business norms that is unavoidable despite due diligence and the culpability of both cargo owners and carriers. This requires review of the total facts and circumstances of a particular case. This new definition and analytical approach fits nicely with COGSA's historical incorporation of the concept of "inherent vice" n146 and makes room for technological improvements and increased environmental awareness in the maritime industry. Its judicial application cannot be successful, however, without a basic understanding of the **[*76]** contractual means by which cargo owners and carriers limit their liability in petroleum shipments.

VIII. Maritime Contract Analysis

Since the Sun Oil ruling, cargo owners and carriers have generally used the same standard charter party agreements. Although litigation has occurred over a variety of commonly used contract terms, the validity of most modern clauses now seems well settled among the judiciary. Contemporary clauses appear to adequately define both cargo and carrier risks. The following is a short discussion of the usage of some of these clauses and an explanation of why other clauses are not commonly found in modern charter party agreements.

A. Charter Party Agreements & Standard Clauses

Today's charter party agreements usually incorporate a variety of clauses designed to limit the risks of oil shortage claims. These include the following: clauses paramount, pumping and discharge clauses, special handling clauses, cargo retention clauses, independent surveyor and measurement clauses, defined quantity clauses, and arbitration and liability clauses.

1. Clauses Paramount

A clause paramount is a clause found in the charter party contract specifically designed to support the interests of cargo owners and to clarify the legal structure governing a private contract. n147 Outbound bills of lading are required to maintain clauses paramount that state that the charter party contract is subject to the provisions of COGSA. n148 This clause arose from attempts by carriers to avoid the provisions of COGSA in early disputes involving oil **[*77]** shortage claims. n149 By claiming that the agreement was not governed by COGSA, carriers could then refute evidence of the bill of lading proffered by the shipper. Since COGSA was designed to govern only bills of lading, the carrier could rebut a shipper's prima facie case of shortage by disclaiming any measurements listed in the bill of lading that contradicted ship-borne ullages. By doing so, the carrier could simply rely on its own evidence that there were no losses and successfully avoid challenge.

Today's charter party agreements make it difficult for the carrier to make these claims. n150 Often, the bill of lading specifically states that the agreement is subject to COGSA and also incorporates the full terms of the charter party agreement, including its clause paramount. Courts have consistently held clauses paramount valid and have used them to rely on COGSA provisions in determining burdens of proof and liability. n151 Cargo shippers and carriers must therefore be wary of the accuracy of all statements and measurements documented in the bill of lading.

2. Pumping & Discharge Clauses

Almost all of today's standard charter party agreements have the same pumping and discharge clauses. n152 These clauses state that the carrier is to take responsibility for the cargo after it crosses the manifold. Arbitral ruling panels have consistently relied on these provisions to apply the general rule of law that ship-borne ullage measurements should be relied on over shore measurements. n153 **[*78]** Since these clauses place the risk of loading and unloading leakage and the responsibility of line displacement checks on the cargo owner, courts have been reluctant to look to those measurements over which the carrier has no control. n154

As a result of standard pumping and discharge clauses, ship-borne ullage measurements remain the primary method of gauging oil losses in overseas shipments. n155 The courts may, however, make comparisons between ship-borne and shore-side measurements in determining discrepancies and assessing how much loss is within acceptable norms. n156 It is therefore important for both shippers and carriers to reach agreement both on the figures listed in the bill of lading and how these figures were established. In the event that there is a disagreement about the figures, a party should prepare an immediate letter of protest to prevent the appearance of acquiescence in the event of a judicial inquiry. n157

3. Special Handling Clauses

Special handling clauses arise in situations where a cargo shipment of a "cocktail mix," or "dirty" or "heavy" petroleum, is being transported. n158 Since these types of cargo often have a higher pour point, they are at greater risk of clingage and fallout, and often require storage and transportation at higher temperatures. n159 Both shippers and carriers need to ensure that special handling clauses are **[*79]** specific as to each parties' responsibilities. The previous case analysis shows that a loss may be attributed to either side if those analyzing the facts can determine which party contributed to the mishandling of the cargo.

In the event that a carrier is required to maintain cargo at an average temperature or heat cargo to a particular temperature, a failure to do so may be considered a lack of due diligence if a loss occurs. n160 Similarly, a shipper that delivers cargo at less than a specified temperature cannot hold the carrier liable for failing to heat the cargo unless the charter party agreement mandates it. n161 To this end, shippers, cargo owners, and carriers must ensure that both parties understand what proper cargo specifications and handling procedures are required and must include sufficient details in their contracts to receive adequate legal protection.

4. Cargo Retention Clauses

Cargo retention clauses are intended to allow a deduction for freight charges as an offset to pumpable cargo remaining on board the carrier's vessel. n162 Although carriers have attempted to utilize these clauses to limit their liability, courts and arbitral panels have found this use to be prohibited by the policies underlying COGSA. n163 For this reason, standard clauses are interpreted as requiring a carrier to prove its claim that it is not responsible for cargo that is unpumpable. n164 A court or arbitration panel will then make a total **[*80]** facts and circumstances evaluation to determine if a cargo loss allowance is appropriate or if someone should be held liable for the cargo remainder on board.

The judgments and awards involving cargo retention clauses appear generally consistent with the analysis underlying modern customary trade allowance concepts. Although a court will permit clauses that allow a deduction from freight charges in a case where a shipper issues challenges to cargo quantity remaining on board, it will likely disregard any clause that automatically limits a carrier's liability for a particular amount of ROB.

5. Independent Surveyor & Measurement Clauses

Either party may desire to have an independent surveyor take required measurements. Although some experts have claimed that an independent surveyor can never really be free of the influence of one party due to the financial support the surveyor receives, n165 these surveyors can be useful to a court's or arbitration panel's analysis. n166 Indeed, where disputes over measurements arise, an independent surveyor can help alleviate the necessity of litigation by reaffirming measurements already taken or by forcing parties to analyze factors not previously considered. In a shortage claim, a court may still find on-board measurements to be controlling, but an independent surveyor can help the court or panel determine the amount of loss that is within trade norms. Arbitral ruling panels have recommended and accepted these clauses as valid since they do not limit liability.

6. Defined Quantity (Inherent Vice) Clauses

Defined quantity clauses appear to be non-existent in modern charter party agreements. Critics of the Sun Oil ruling argued that the shipper could negotiate for a particular customary trade **[*81]** allowance figure to ensure protection from excessive losses. n167 The Sun Oil facts demonstrate that cargo owners may not be able to negotiate against a fixed term defining the total quantity to be delivered. n168 The fact that Sun Oil was unable to gain a 0.25% customary trade allowance contract term evidences the carrier's strong negotiating power in charter-party contracts.

Even if shippers could agree as to the incorporation of these clauses into a charter party agreement, enforceability would remain questionable. n169 In cases where parties have attempted to redefine the package limitation, courts have stated that only the Legislature could determine these issues. n170 Though the Legislature has not defined the quantity of loss that may be acceptable in a bulk cargo claim, COGSA does present the parties with the expectation that they should receive their full shipment of cargo, or at least as much of the cargo as is feasible and within trade norms. n171 By forcing the carrier to prove it is free from liability, COGSA's statutory burden of proof scheme would seem to trump this type of defined quantity clause. n172

7. Arbitration & Liability Clauses

Alternative dispute resolution (ADR) clauses have become issues of rising importance in recent years and are also common in standard charter party agreements. The fact that most charter party agreements incorporate a standard arbitration clause has likely curtailed the expense of lengthy litigation over oil shortage claims. But the previous analyses have shown that the majority of courts and arbitral panels have applied the same general analysis in their **[*82]** opinions. In either forum, the ruling body is likely to examine all the facts and circumstances underlying a potential shortage claim before determining whether a carrier is liable. Since maritime shipping claims are often brought before the same circuit courts and arbitrators, it seems unlikely that incorporation of a particular choice of situs would have a major impact on the resolution of claims. It appears that any permitted cargo loss allowance will ultimately depend on findings of liability and the individual factors of a specific case.

IX. Recommendation: Utilize Total Facts and Circumstances Analysis and Cargo Loss Allowance Terminology

Presently, there appears to be some confusion in both arbitral judgments and judicial opinions regarding the definition of customary trade allowance principles. In order to prevent future confusion, courts and arbitral panels should seek to clarify this area of law. Legal clarification could be garnered from any number of the interpretive approaches taken by those charged with evaluating oil loss cases.

Arbitrary Percentage Approach: First, a court or arbitral panel could simply recognize that bulk cargo losses can reach up to 0.5%, arbitrarily reaffirming the 0.5% customary trade allowance figure as the allowable amount of loss. This approach could be used to reduce either the carrier's liability or damages. It is arguably the judicial approach that is easiest and most efficient to apply since it cuts down the factual inquiry a court must make. As has been discussed, however, this approach appears to be improper. It fails to acknowledge that in any shortage case there are various factors that could have contributed to the loss. Furthermore, it fails to promote improvements in maritime standards.

Express Term Approach: Another approach would be for the court or arbitral panel to look to the express terms in a charter party contract to determine what quantity of loss should be associated with trade customs. This approach, however, is also flawed. It fails to acknowledge that the carrier is likely to have the upper hand in bargaining about these terms during a charter party negotiation. n173 **[*83]** The ruling body could determine that when the contract terms do not specify an amount, the carrier should be liable for all unexplained losses. However, principles of customary trade allowance remain too entrenched for this. Furthermore, contemporary shippers and carriers have not generally defined quantity contract terms incorporating a definition of customary trade allowances. n174 Even if they were to do so, any clauses limiting the carrier's liability for a customary trade allowance percentage are not likely to withstand judicial scrutiny or the policies behind COGSA. These clauses are likely to be interpreted as attempts by the carrier to expressly limit liability by contractual terms.

Administrative Standards Approach: A third approach that a ruling body could take in determining the appropriate amount of customary trade allowance could be to look toward figures established by an administrative agency (e.g., the American Petroleum Institute (API)) for an appropriate shortage claim adjustment. Because shippers and carriers have historically relied on API for measurement standards, definitive statistics for petroleum temperature and volume conversion already exist. n175 It therefore seems appropriate for courts to rely on API estimates in applying shortage allowances.

At first glance this approach appears intriguing. It would force shippers and carriers to fight the battle over customary trade allowance in an administrative forum. It would also promote improvements in industry procedures and technology as both shippers and carriers sought to share data proving that their statistics were more accurate. Its simplicity and rigidity, however, are its downfalls. Although the incorporation of API standards in resolving issues of oil shortages would certainly reflect industry standards, it would remove individual case facts from judicial scrutiny. Such a test fails to account for all of the separate factors that may contribute to a particular shortage case, including a ship<acute>s particular **[*84]** characteristics. Also, API figures regularly change over time and the potential for inappropriate reliance on outdated figures was demonstrated in past cases relying on the customary trade allowance figure of 0.5%.

Recommendation - Total Facts and Circumstances Approach: The best approach to dealing with the customary trade allowance is the one that courts and arbitral panels are already taking. The trend toward looking at all of the facts and circumstances surrounding a shortage claim appears to be the rule that is most consistent with COGSA. n176 Historical evidence indicates that this is a rule that promotes beneficial economic and market changes. It is one that has already been proven and tested. n177 Since modern maritime studies now provide reasons explaining why a cargo may come up short, full scrutiny of those factors is necessary to determine whether a party's own fault likely contributed to the loss. Courts and arbitral panels should therefore move away from the outdated notion of customary trade allowance by replacing it with the clarity of a new test and incorporating simple cargo loss allowance terminology.

X. An Appropriate Mechanism for Settlement

The total facts and circumstances approach currently found in cases evaluating customary trade allowance issues promotes the early settlement of court cases. In situations where a shipper believes there is a loss outside industry norms, the shipper is likely to invoke an arbitration clause or initiate litigation. By analyzing the total facts and circumstances of any particular case, the courts and arbitral panels have been able to maintain a check on industry standards. Although court and arbitral estimates might not be accurate to the nth barrel, allowing judicial scrutiny of all the facts precludes a carrier from escaping liability without addressing whether it properly stored and handled the cargo. Shippers and carriers are thus encouraged to avoid the expenses of a total facts and **[*85]** circumstances inquiry by reaching early settlement with the continued use of offsets adjusted for normal losses in a manner that integrates changed industry standards over time. Additionally, a redefined approach to an outdated doctrine will prevent future trouble by promoting legal consistency.

XI. Conclusion

Although courts and arbitral panels have struggled with the issue of customary trade allowance in the past, it appears that they are on the right path for the future. The various factors that can contribute to an oil shortage claim require that the totality of the circumstances be taken into account before the ruling body makes an adjustment for any petroleum loss that might be considered unavoidable. Since most losses today can be analyzed and explained through the use of industry reports, updated conversion tables, and modern measurement technologies, it is clear that the Third Circuit's ruling in Sun Oil has helped promote awareness and accountability in the maritime industry.

Although past critics argued that acceptance of trade custom is compatible with COGSA, they failed to note that the drafters of COGSA had already accounted for customary trade allowance in COGSA, section 4(2)(m), by accounting for wastage in bulk and the inherent characteristics of bulk cargoes in a unique burden of proof scheme. Courts and arbitrators are therefore wise not to rely on standards outlined in previous cases when applying a cargo loss allowance percentage. Each individual cargo type is likely to have its own special properties and characteristics that will account for varying amounts of loss in any particular case. With each case having distinct facts that contribute differently to the validity of a loss claim, adjustments for normal cargo loss allowances can not be made in good faith without hearing the total facts and circumstances as presented by both parties.

On a final note, it would be remiss not to address critics' arguments that the Sun Oil ruling has placed an unwarranted burden on the carriers. n178 The carrier's burden is in fact no more and no less than it should be. Due to the costs of litigation, shippers are unlikely **[*86]** to bring a claim for an unexplained loss unless they are reasonably certain the carrier is at fault and the loss is more than industry norms. When cases are brought, the responsibility for accountability should rest on the party most able to incorporate technological change and modernization - the carrier. Though some might say that judicial officials are not as wise as commercial men, n179 research indicates that at least with regard to customary trade allowance concepts, most arbitrators and judges have come to the same insightful conclusion: the facts count. As oil prices return to levels not reached since the 1970s, it is clear that customary trade allowance remains a haunting ghost of the distant past. Courts, arbitrators, and academics should not let the customary trade allowance harbor future trouble, but should recognize that petroleum measurement is indeed a science rather than an art. n180

[*87]

Appendix:Comparison of Typical Maritime Tanker Sizes & Respective Estimates of 0.5% Customary Trade Allowances

[SEE TABLE IN ORIGINAL]

FOOTNOTES:

n1. See generally F. Gregory Gause III, Saudi Arabia Over a Barrel, 79 Foreign Aff. 80 (2000) (discussing the recent spike in oil prices).

n2. See Energy Information System, Petroleum: An Energy Profile 1999, available at http://www.eia.doe.gov/pub/oil<uscore>gas/petroleum/analysis<uscore>publications/ petroleum<uscore>profile<uscore>1999 (last visited Oct. 7, 2000) [hereinafter Petroleum] (providing general background information on petroleum dependence and the U.S. economy). See also Energy Information Administration, Report <number> DOE-EIA-0484 (2000): International Energy Outlook 2000, available at http:// www.eia.doe.gov/oiaf/ieo/index.html (noting estimates of future increases in petroleum resource dependence from 73 million barrels per day (mbd) to 113 mbd in 2020, primarily due to the transportation sector).

n3. *771 F.2d 805 (3d Cir. 1985).*

n4. *Id. at 814-15.*

n5. See *Palmco Inc. v. Am. President Lines, 1978 AMC 1715, 1722 (D. Or. 1977).*

n6. See *Sun Oil, 771 F.2d at 817* (allocating "the risk of loss for damage to cargo carried on ocean liners in international commerce under bills of lading") (citing Carriage of Goods bv Sea Act (COGSA), *46 U.S.C. 1300*-1365 (1982)); see also Michael F. Sturley, The History of COGSA and the Hague Rules, *22 J. Mar. L. & Com. 1, 4 (1991).* But see *Sun Oil Co. of Pa. v. M/T Mercedes Maria, 1983 AMC 718, 720 (E.D. Pa. 1983),* rev'd, *771 F.2d 805 (3d Cir. 1985)* (holding customary trade allowance valid).

n7. See, e.g., *S.T.S. Int'l, Ltd. v. Laurel Sea Transp., Ltd., 932 F.2d 437, 441 (5th Cir. 1991)* (avoiding use of customary trade allowance terminology but discussing historically accepted calculations made under customary trade allowance standards, including those made for evaporation and measurement errors); Derin Shipping & Trading v. Delphi Petroleum, SMA No. 2979 (June 15, 1993) (Bauer, Arb.) (refusing to apply customary trade allowance in the event carrier's ship is found "unseaworthy").

n8. Compare *New England Petroleum Co. v. O.T. Sonja, 732 F. Supp. 1276, 1286 (S.D.N.Y. 1990)* (considering but refusing to apply customary trade allowance of 0.5% while failing to delineate a clear rule regarding customary trade allowance), with Sun Int'l Ltd. v. Salonica Trust Corp., SMA No. 3291 (Aug. 20, 1996) (Bulow, Arb.) (refusing to apply customary trade allowance in situations where a carrier breached contractual terms). See also Peter D. Clark, Trade Allowance Still Applied to Oil Tanker Shortage Claims, J. Comm., Nov. 25, 1996, at 2b (noting continued use of customary trade allowance terminology in court opinions).

n9. See Petroleum, supra note 2.

n10. See Petroleum, supra note 2.

n11. See International Tanker Organization, The Tanker Newsletter, available at http://www.intertanko.com/pdf/newsletter/newsletter4.pdf (last visited Nov. 20, 2000).

n12. The academic community initially reacted negatively to the Sun Oil case, but few authors have addressed the issue since the court made its ruling in 1985. See, e.g., Kenton Deem Longaker, Maritime Law - Custom - Carriage of Goods By Sea Act Precludes Enforcement of Oil Shipping Industry's 0.5% Customary Trade Allowance, *31 Vill. L. Rev. 1221, 1224 (1986)* (criticizing the Third Circuit's strict construction of COGSA in Sun Oil); Craig L. Staples, The 0.5% Trade Allowance: The Third Circuit Holds the Custom Unenforceable Under COGSA, *10 Mar. Law. 183, 190-97 (1985)* (arguing that the Third Circuit's holding in Sun Oil is not mandated by COGSA and suggesting reasons for the custom's validity). But see Clark, supra note 8, at 2b (noting continued use of customary trade allowance terminology in court opinions).

n13. The calculation of one-half of one percent trade allowance for 8.2 million barrels of oil is equivalent to 41,000 barrels (0.005 x 8,200,000 = 41,000). Since maritime transportation only accounts for 50% of imports, this figure must be adjusted by half to reach an approximate figure of 20,500 bpd of potential loss allowance. ($ 20,500 x $ 24 = $ 492,000).

n14. See generally Daniel Yergin, The Prize (1992) (providing a comprehensive historic background on developments in the oil industry).

n15. See Frank J. Berto, Review of Tank Measurement Errors Reveals Techniques for Greater Accuracy, Oil & Gas J., Mar. 3, 1997, at 68 (discussing oil measurement history).

n16. Id.

n17. Id.

n18. See Petroleum, supra note 2 (describing origins of modern oil tanker transportation).

n19. See Yergin, supra note 14, at 66-67 (discussing the developments of early bulk oil shipping vessels).

n20. See Robert Thomajan, Tanker Problems in Arbitration: The 0.5% Allowance, *14 J. Mar. L. & Com. 225, 226 (1983)* ("The precise origin of the 0.5% allowance is not certain. Many attribute the figure to the standard deductible used in the insurance industry on cargoes of crude oil; a deductible was intended to cover the inevitable unexplained loss or evaporation of cargoes in transit.").

n21. Deadweight tons (dwt) is the term utilized to express the lifting capacity of waterborne tankers in long tons (lt) (2,240 pounds/1.016 metric tons). One deadweight ton is equivalent to about seven to eight barrels of crude oil. See Petroleum, supra note 2 (describing deadweight tons in footnote 4).

n22. See Press Release, Sumitomo Metal Industries Ltd., Mobil Joint Venture Company Takes Delivery of New Double-Hull Tanker, API EnCompass: News, API No. BY00689, Jan. 14, 1999, available at *1999 WL 10628798* [hereinafter Press Release] (describing current standards for large crude oil carriers).

n23. See Appendix: Comparison of Typical Tanker Sizes and Respective 0.5% Customary Trade Allowance Losses, infra. The calculation of one-half of one percent trade allowance for 2.2 billion barrels of oil is equivalent to 11,000 barrels (0.005 x 2,200,000/bbl = 11,000/bbl).

n24. See *Sociedade Portuguesa de Navios Tanques, Ltda. v. Amoco Transp. Co., 1984 AMC 769, 775-76 (S.D. Tex. 1983)* (holding that the defendant is not liable for oil cargo remaining on board when remainder was found to be unpumpable); James M. Textor, Oil Shortages Caused by the Inherent Properties of Petroleum Cargoes, *13 J. Mar. L. & Com. 281, 291-92 (1982)* (describing difficulties of out-pumping oil cargoes due to clingage).

n25. 11,000 bbl x $ 20.00/bbl = $ 220,000.

n26. For an example of breakthrough technology in tanker transportation, see Mo Husain, Oil Tanker Design & Oil Transportation, Congressional Testimony by Federal Document Clearing House, June 29, 1999, available at *1999 WL 2009508* (discussing vacuum technology designed to control oil spills).

n27. See Yergin, supra note 14, at 580-81 (discussing the rising costs of oil in the early 1970s and the resultant union of oil companies organized to negotiate with OPEC).

n28. See J. Hatley Locher, Shipbottom Sampling Aids Water Measurement, Oil & Gas J., Nov. 1, 1982, at 80 (noting a fifteen-fold increase in oil prices and discussing increased focus on oil shipment accountability).

n29. See Yergin, supra note 14, at 580-81.

n30. See Locher, supra note 28, at 80 (referencing the decade-long dramatic rise in crude prices).

n31. See, e.g., Locher, supra note 28, at 80.

n32. An increase in oil-shortage cases occurred in the 1970s and 1980s commensurate with the increase in oil prices. See *Sun Oil Co. of Pa. v. M/T Mercedes Maria, 1983 AMC 718, 720 (E.D. Pa. 1983),* rev'd, *771 F.2d 805 (3d Cir. 1985)* (taking note of the defendants' claims that an increase in oil prices has been the impetus behind challenges to the customary trade allowance).

n33. Since the Sun Oil ruling, however, there has been a marked decrease in both litigated and arbitrated oil-shortage cases. LEXIS and Westlaw databases including SMA (Society of Maritime Arbitrators), AMC (American Maritime Cases), and federal court rulings documented only about four litigation cases and twelve arbitration cases dealing with bulk petroleum cargo shortage claims.

n34. See Staples, supra note 12, at 184.

n35. *Sun Oil Co. of Pa. v. M/T Carlisle, 771 F.2d 805, 807 (3d Cir. 1985).* One Sea Transport and Tradax Gestion were also defendants in the lawsuit.

n36. *Id. at 808.*

n37. *Id. at 805, 816.* The court cited the Restatement (Second) of Contracts

222(1): "A usage of trade is a usage having such regularity of observance in a place, vocation, or trade as to justify an expectation that it will be observed with respect to a particular agreement," and the *Uniform Commercial Code 1-205(2)*: "A usage of trade is any practice or method of dealing having such regularity of observance in a place, vocation, or trade as to justify an expectation that it will be observed with respect to the transaction in question."

n38. *Sun Oil, 771 F.2d at 808-09.* In most rulings it is unclear whether or not measurements are calculated using Net Barrels (total oil cargo minus bottom sediment and water BS&W) or Gross Barrels (total oil cargo plus BS&W). In spite of this fact, the Third Circuit's calculations appear accurate: 0.5% of 540,401 barrels is approximately 2702.005 barrels. The shortage of 2,835 barrels is thus 133 barrels in excess of the 0.5% customary trade allowance. Costs at stake at $ 38.01/barrel (1980s prices) were: 133 barrels totaling $ 5,055.31 versus 2,835 barrels totaling $ 107,758.

n39. *Id. at 809.*

n40. Id.

n41. *Id. at 811-12* (applying the Uniform Commercial Code and Second Restatement (Second) of Contracts to the case).

n42. *Id. at 812.*

n43. *Sun Oil, 771 F.2d at 811* (citing COGSA, 3(8), *46 U.S.C. 1303*(8)).

n44. *Id. at 813.*

n45. Id.

n46. *Id. at 816.*

n47. *Sun Oil, 771 F.2d at 817* (Hunter, J., dissenting).

n48. *Id. at 816.*

n49. See *id. at 816-17;* see also COGSA 4, *46 U.S.C. app. 1304*(2)(m) (listing exceptions for "wastage in bulk or weight or any other loss or damage arising from inherent defect, quality or vice of the good").

n50. *Sun Oil, 117 F.2d at 812-15.*

n51. See COGSA, 3(8), *46 U.S.C. 1303*(8).

n52. See *Sun Oil, 117 F.2d at 813.*

n53. *Id. at 815.*

n54. See *id. at 812.*

n55. COGSA 4, *46 U.S.C. app. 1304*(1) (1994).

n56. See Longaker, supra note 12, at 1239 (agreeing with the district court's ruling and finding the Third Circuit's refusal to reach a similar conclusion untenable); Staples, supra note 12, at 191-92 (noting that the district court's careful distinction avoided a conflict under COGSA). Neither critic discussed the possibility of negligence by the carrier or shipper.

n57. *Sun Oil Co. of Pa. v. M/T Carisle, 771 F.2d 805 (3d Cir. 1985)* (allocating "the risk of loss for damage to cargo carried on ocean liners in international commerce under bills of lading") (citing COGSA, *46 U.S.C. 1304*(2)(m) (1982)).

n58. See, e.g., *Sun Oil Co. of Pa. v. S.S. Overseas Arctic, 27 F.3d 1104, 1109-11 (5th Cir. 1994)* (struggling to apply COGSA's burden of proof scheme); Naftoma Shipping and Trading Co., Ltd. v. Vinmar, SMA No. 3165 (Apr. 24, 1995) (Szostak, Arb.) (discussing the possibility of applying customary trade allowance in a short loading case).

n59. See, e.g., *S.T.S. Int'l v. Laurel Sea Transp., 932 F.2d 437, 440 (5th Cir. 1991)* ("We believe the more flexible rule of allowing the fact finder to consider all relevant and reliable evidence is the better rule, especially given present measurement practices and technology.").

n60. See e.g., id. (allowing the plaintiff to present all relevant facts and stating that the amount on the bill of lading, not the more uncertain ullage measurement taken before departure, is prima facie evidence of the amount received).

n61. E.g., Derin Shipping & Trading, Ltd. v. Delphi Petroleum, SMA No. 2979 (June 15, 1993) (Bauer, Arb.) (noting that a customary trade allowance could be applied in a case where a vessel is considered "seaworthy").

n62. Nine litigated cases since the Sun Oil ruling were examined from LEXIS and Westlaw. Of those, only four concerned petroleum shortages. Most of the non-petroleum cargo shortage cases appear to be governed by the package limitation provisions of COGSA. See *W.K. Webster & Co. v. Am. President Lines, 1995 AMC 134 (2d Cir. 1994)* (dealing with cargo of rice); *Union Steel Am. Co. v. M/V Sanko Spruce, 14 F. Supp. 2d 682 (D.N.J. 1998)* (dealing with cargo of steel fence piping); *Pyropower Corp. v. M/V Alps Maru, 1993 AMC 1562 (E.D. Pa. 1993)* (dealing with cargo of boiler parts); *Assoc. Metals & Minerals v. M/V Lumbe, 1993 AMC 700* (D.N.J., 1991) (dealing with cargo of steel coils). But see COGSA 4(5), *46 U.S.C. app. 1304*(5) (1994) (limiting a carrier's liability to $ 500 per package).

n63. *1990 AMC 2758 (E.D. La. 1990).*

n64. See, e.g., *S.T.S. Int'l v. Laurel Sea, 932 F.2d 437, 440 (5th Cir. 1991)* ("We believe the more flexible rule of allowing the fact finder to consider all relevant and reliable evidence is the better rule.").

n65. *New England Petroleum Co. v. O.T. Sonja, 732 F. Supp. 1276, 1286 (S.D.N.Y. 1990).*

n66. See, e.g., *id. at 1284* (holding that where a carrier failed to meet contractual obligations to heat cargo, it could not claim the COGSA 4(m) defense of "inherent vice").

n67. See, e.g., *Sun Oil Co. of Pa. v. S.S. Overseas Arctic, 27 F.3d 1104, 1112 (5th Cir. 1994)* (holding that when parties to a contract did not require the carrier to increase temperature of cargo, carrier could not be held liable for sedimentation and clingage of petroleum remainder on board when charter party delivered cargo at temperature lower than pour point and failed to respond to carrier's notice of delivery below contract specifications).

n68. See, e.g., *New England Petroleum, 732 F.2d at 1287* ("Plaintiff demonstrated, however, that the defendant's negligence was a concurrent cause of the loss and as such is entitled to all damages that defendant cannot segregate.").

n69. SMA No. 2384 (June 28, 1987) (Cederholm, Arb.).

n70. Id.

n71. Compare id. (evaluating normal industry loss expectations), with Liberty Maritime Corp. v. Moldova, SMA No. 3264 (June 13, 1995) (Lang, Arb.) (evaluating customary trade allowance in corn and soybean meal case).

n72. See, e.g., Liquid Bulk Tanker Services, Inc. v. M/T Westport Clipper & Embassy of Bangladesh, SMA No. 2953 (Feb. 26, 1993) (Cederholm, Arb.) (evaluating normal industry loss expectations).

n73. See Horizon Petroleum Co. v. Marmadura Compania Naviera, SMA No. 2547 (Feb. 20, 1989) (Proeller, Arb.) (considering the behavior of the parties when determining the damage amount awarded for shortage of crude oil).

n74. See Argonaut AB v. Scanports Shipping, SMA No. 2856 (Jan. 31, 1992) (Laing, Arb.) (evaluating normal industry loss expectations but recognizing the arbitrary nature of a fixed 0.5% customary trade allowance).

n75. See Sun Refining & Marketing, Inc. v. A/S Seateam, SMA No. 2556 (Mar. 1, 1989) (O'Connell, Arb.) ("Today, the trade allowance amount is to be determined by evidentiary proof.").

n76. The same arbitrators often serve in maritime disputes. For example, Henry E. Engelbrecht served on the panels in both Sun Int'l v. Salonica Trust Corp., SMA No. 3291 (Aug. 20, 1996) (Bulow, Arb.), and Liquid Bulk Tanker Serv., Inc. v. M/T Westport & Embassy of Bangladesh, SMA No. 2953 (Feb. 26, 1993) (Bauer, Arb.).

n77. See Longaker, supra note 12, at 1239 (discussing the enforcement of the customary trade allowance and questioning the utility of the Third Circuit's finding that the 0.5% allowance violates COGSA); Staples, supra note 12, at 199-201 (discussing the decision to hold the allowance enforceable).

n78. See Longaker, supra note 12, at 199 (claiming that the Sun Oil decision would inject "an unfortunate element of uncertainty into commercial and legal relations between the parties to contracts of bulk oil ocean carriage"); Staples, supra note 12, at 1243 (arguing that "the court's decision places an onerous and arguably inequitable burden on future carriers" and noting in footnote 114 that the ruling would result in "excessive litigation").

n79. See generally Thomajan, supra note 20 (discussing the origin of the 0.5% allowance and exploring its legal significance); Textor, supra note 24 (describing the types of oil shortages that may give rise to liability).

n80. Compare Longaker, supra note 12, and Staples, supra note 12 (failing to address works of their contemporaries), with Thomajan, supra note 20, at 228 (noting, two years before the Third Circuit's Sun Oil ruling, that "[a] presumption favoring any loss allowance-not just the 0.5% allowance-is inconsistent with the scheme of COGSA, whereunder the carrier is liable for all provable loss unless it can bring itself within one of the specified exemptions," and citing *Schnell & Co. v. S.S. Vallescura, 293 U. S. 296, 303 (1934)),* and Textor, supra note 24, at 294 (discussing the various factors potentially resulting in an oil-shortage claim and advising both shippers and carriers to "approach all oil shortage disputes, especially de minimis ones with care").

n81. See generally Longaker, supra note 12 and Staples, supra note 12. See also COGSA 4(2)(m), *46 U.S.C. app. 1304*(2)(m) (listing exceptions for "wastage in bulk or weight or any other loss or damage arising from inherent defect, quality, or vice of the good").

n82. See COGSA 4(2)(q), *46 U.S.C. app. 1304*(2)(q) ("But the burden of proof shall be on the person claiming the benefit of this exception to show that neither the actual fault or privity of the carrier nor the fault or neglect of the agents or servants of the carrier contributed to the loss or damage.").

n83. The concepts underlying COGSA 4(2)(m) remained fairly consistent throughout historic discussions of proposals for the Hague Rules and the enactment of COGSA. Compare Dr. W.R. Bisschop, Report on the work of the committee and on the Rules Regulating the Carriage of Goods by Sea under Bills of Lading, in Michael F. Sturley, The Legislative History of the Carriage of Goods by Sea Act and the Travaux Preparatoires of the Hague Rules, Vol. 2 at 291 (1990) (quoting Sir Norman Hill on the discussion of proper burden of proof resting on the carrier for bulk cargoes), with Hearing on COGSA, Sess. 2 reprinted in Sturley, supra, Vol. 1, at 397 (documenting proposal of M. de Rousiers, French delegate, on proposed COGSA Article 4(2) to replace item (m) with present day text). The Hearing on COGSA goes on to explain

that all goods subject to the carriage of goods by sea for any length of time are liable (except in rare cases) to fluctuations in weight; either because of evaporation, which affects the goods particularly under the influence of the heat in the holds, or by absorption of humidity of the air.

Id.

n84. See generally Sturley, supra note 83.

n85. See COGSA 4(2)(m), *46 U.S.C. app. 1304*(2)(m).

n86. See generally Bisschop, supra note 83; Sturley, supra note 83.

n87. See generally Sturley, supra note 83.

n88. See *Sun Oil Co. of Pa. v. M/T Carisle, 771 F.2d 805, 813 (3d Cir. 1985)* ("Sun proved its loss, and the carrier offered no evidence as to cause of loss, existence of a statutory exception, or its exercise of due diligence, relying instead on the 0.5% allowance.").

n89. See id.

n90. See *id. at 807.*

n91. See COGSA 4, *46 U.S.C. app. 1304.* The statute includes no arbitrary number for calculating inherent vice losses.

n92. See id. (discussing the burden of proof for carrier and ship).

n93. See id. (outlining the rights and immunities of carrier and ship).

n94. *Sun Oil Co. of Pa. v. M/T Mercedes Maria, 183 AMC 718* (E.D. Pa. 1983, rev'd, *771 F.2d 805 (3d Cir. 1985).*

n95. The case most frequently cited in support of the customary trade allowance is one that deals with a shortage of palm oil rather than petroleum cargo. See *Palmco Inc. v. Am. President Lines, 1978 AMC 1715, 1722 (D. Or. 1977)* (accepting the defendant's argument that there is always some explainable loss called "tare" in petroleum cargo shipments and applying that standard to the case).

n96. See, e.g., *Palmco, 1978 AMC at 1722;* Clarendon Ltd. v. Eastwood Shipping Corp., SMA No. 2999 (Aug. 6, 1993) (Busch, Arb.) (relying on 0.5% customary trade allowance despite evidentiary-based arguments that it should not be applied in a case dealing with a cargoload of scrap materials).

n97. See, e.g., Clarendon, SMA No. 2999.

n98. Prof. Basil Markesinis, Emergence of Modern European Law, Lecture at the University of Texas at Austin (Feb. 17, 1999) (discussing (1) the danger of simply cutting and pasting reasoning from previous court opinions into future legal arguments, (2) the potential for judicial decisions based on faulty logic as a result of today's high-speed electronic-research databases, and (3) the failure of the judiciary to properly focus on the appropriate raison d'etre).

n99. *2 Lloyd's Rep. 69 (QBD 1987)* (holding that plaintiff had failed to prove a shortage, notwithstanding the final shore figures).

n100. See *id. at 70-73.*

n101. See *id. at 70* (putting the burden upon the plaintiff to prove a shortage upon delivery).

n102. See Longaker, supra note 12, at 1238 ("By contrast the trade usage at issue in Sun Oil is not a fault-based concept, and therefore is fully reconcilable with the statute.").

n103. See, e.g., *Sun Oil Co. of Pa. v. M/T Carisle, 771 F.2d 805, 815 (3d Cir. 1985)* ("COGSA provides that in [some] circumstances the carrier can be relieved of this obligation, but only after the carrier has borne the burden of showing that the shortage in that instance resulted from an "inherent vice.'").

n104. See *id. at 807-13* (discussing defendant's attempt to avoid liability for an amount up to the customary 0.5% trade allowance and requiring carrier to prove that its negligence did not contribute to the loss).

n105. See generally Longaker, supra note 12 (addressing developments in the industry since the Sun Oil ruling, yet failing to discuss Sun Oil's possible impact); Staples, supra note 12 (failing to address the potential market and economic impact of the Sun Oil ruling).

n106. See *Sun Oil Co. of Pa. v. M/T Mercedes Maria, 1983 AMC 718, 725 (E.D. Pa. 1983)*, rev'd, *771 F.2d 805 (3d Cir. 1985)* ("Moreover, we cannot ignore the importance of evidence that the attempts of plaintiff Sun Oil Company of Pennsylvania ... to include a 0.25% allowance as an express written contract term in its charter parties were consistently rejected by the carriers with whom it was dealing.").

n107. See, e.g., *S.T.S. Int'l v. Laurel Sea Transp., 932 F.2d 437, 440 (5th Cir. 1991).*

n108. See generally, Longaker, supra note 12; Staples, supra note 12.

n109. See, e.g., Textor, supra note 24, at 282 (discussing "true" and "false" oil losses).

n110. See Textor, supra note 24, at 282 (describing most common sources of oil shortages).

n111. See, e.g., *S.T.S. Int'l Ltd. v. Laurel Sea Transp., Ltd., 932 F.2d 437, 439 (5th Cir. 1991)* (discussing historically acceptable reasons for shortage claims).

n112. See generally *Amoco Oil Co. v. Parpada Shipping Co., Ltd., 2 Lloyd's Rep. 69 (Q.B. 1987)* (discussing various factors potentially leading to oil shortage claims).

n113. *Id. at 70* (defining "ullage" as the distance between the liquid and a measuring point at or near the top of the tank).

n114. See, e.g., Esso Nederland B.V. v. Int'l Bulk Serv. Panamanian Shipping & Chartering Co., SMA No. 2140 (Aug. 6, 1985) (Berg, Arb.) (noting the existence of ballasting and dumping concerns in the context of an oil shortage claim).

n115. See, e.g., Tesoro Petroleum Corp. v. United Steamship Corp. & M/T Amelia Grimaldi, SMA No. 2326 (June 10, 1986) (Berg, Arb.) (stating that ROB never falls within the trade allowance because it is, by definition, measurable).

n116. See, e.g., Texas City Refining v. Imbar Maritima S.A. Monrovia, Liberia, SMA No. 2657 (Mar. 26, 1990) (Bauer, Cederholm, Nixon, Arb.) (evaluating on-board quantity concerns in oil shortage claim).

n117. The vessel experience factor (VEF) is a statistic individually tailored to provide an average estimate of how much cargo a particular ship will likely lose in any particular voyage due to measurement inaccuracies and other factors. VEF figures first arose in the 1980s and are now commonly used in the maritime industry. Courts and arbitration panels should take into account VEF figures in their analysis of the total facts and circumstances of any particular oil shortage claim. See *New England Petroleum Co. v. O.T. Sonja, 732 F. Supp. 1276, 1282-83 (1990)* (taking into account vessel experience factor (VEF) in determining liability for cargo shortage); see also S. Sivaraman, Vessel Experience Factor Issues Clarified, Oil & Gas J., Oct. 15, 1990, at 44 (discussing vessel experience factors and their importance in evaluating proper measurement); Donald T. Bruce, Vessel Experience Factor Study Aimed at Cutting Cargo Losses in Ship/Shore Measurements, Oil & Gas J., Aug. 29, 1983, at 57 (providing results of initial VEF studies).

n118. See, e.g., *S.T.S. Int'l, Ltd. v. Laurel Sea Transp., Ltd., 932 F.2d 437, 438 (5th Cir. 1991)* (involving the relatively small claim of approximately .005% loss).

n119. See, e.g., Textor, supra note 24, at 293 (arguing that the "inherent properties of petroleum" contribute to cargo loss).

n120. See, e.g., Staples, supra note 12, at 195 (noting from trial transcripts that Sun Oil relied on a loss study prepared by Cities Services estimating average in-transit losses well below 0.5%, and between 0.137% and 0.4%).

n121. See Frank J. Berto, Automatic Gauging Technologies have Advanced, But Better Accuracy is Needed, Oil & Gas J., Mar. 10, 1997, at 63 (discussing modern measurement technology).

n122. See, e.g., Sun Int'l Ltd. v. Salonica Trust Corp., SMA No. 3291 (Aug. 20, 1996) (Bulow, Arb.) (discussing standard cargo measurements).

n123. See, e.g., Donald T. Bruce et al., Cities Service Develops System to Monitor Petroleum Losses, Oil & Gas J., May 9, 1983, at 95 (discussing Crude Carrier Loss Analysis System (CCLAS), a computer database tracking system designed to uniformly analyze crude oil shipment losses).

n124. See Berto, supra note 121, at 63.

n125. See Berto, supra note 121, at 63.

n126. Compare Bruce et. al., supra note 123, at 95 (noting that in as early as 1983 loss control specialists such as Frank Lindner of Getty Oil were utilizing computer software to support shortage claims, anticipating "that the accumulation of accurate data will enable loss-control management personnel to successfully challenge the marine industry's "0.5% customary trade allowance' and have it reduced to a more realistic figure"), with Staples, supra note 12, at 195 (noting from trial transcripts that Sun Oil relied on a loss study prepared by Cities Services estimating average in-transit losses well below 0.5% and between 0.137% and 0.4%).

n127. See Bruce et al., supra note 123, at 95 (positing the importance of oil loss working groups to major oil companies).

n128. See Textor, supra note 24, at 292 (discussing the importance of oil washing techniques to prevent clingage of prior cargo).

n129. See *S.T.S. Int'l, Ltd. v. Laurel Sea Transp., Ltd., 932 F.2d 437, 448 (5th Cir. 1991)* (focusing on the importance of line tests in determining how much cargo was properly offloaded).

n130. See Textor, supra note 24, at 290 (discussing the necessity of ensuring that a tanker's pressure vacuum relief valves are in good working order).

n131. Compare Textor, supra note 24, at 290 (discussing excess cargo evaporation resulting from carrier's use of shortcut procedures in cargo discharge operations), with *New England Petroleum Co. v. O.T. Sonja, 732 F. Supp. 1276, 1283-84 (S.D.N.Y. 1990)* (evaluating defendant's liability for cargo discharged at other than optimum pour-point cargo temperature).

n132. See Textor, supra note 24, at 290 (explaining changes in discharge and ventilation measures).

n133. For general background information on the American Petroleum Institute (API) see API Homepage, at http://www.api.org (last visited June 26, 2000) (explaining API's role as the industrial information clearing house). But see Berto, supra note 15, at 68 (highlighting the inaccuracies of API's previous cargo conversion tables).

n134. See James M. Textor, COGSA: Petroleum Shortage Transit Allowance: Sun Oil Company v. The Mercedes Maria, *14 J. Mar. L. & Com. 269, 274-75 (1983)* (emphasizing potential causes of oil shortage loss in the industry at the time and the impact of the district court ruling upon industry concerns with safety).

n135. For a comprehensive discussion of economics and the law, see generally Richard A. Posner, Economic Analysis of Law (1998).

n136. See, e.g., Richard Martin, Tankers for the New Millenium,

ABC News.Com, at http://www.abcnews.go.com/sections/tech/dailynews/tankers 990322.html (Mar. 22, 1999) (emphasizing the improvements in safety and technology resulting from the Exxon Valdez oil spill that resulted in an 11 million gallon cargo leak into Prince William Sound off the coast of Alaska in 1989).

n137. See id. (discussing improved safety legislation under the U.S. Oil Pollution Act of 1990).

n138. See id. (discussing new requirements for double-hull tanker designs).

n139. See generally Husain, supra note 26 (discussing improvements in oil tanker design, including the American Underpressure System, which is designed to "create a slight vacuum (two to four pounds per square inch) in each cargo tank" that when "assisted by the outside hydrostatic pressure of the surrounding water, prevents or minimizes cargo loss in the event of hull rupture").

n140. *Sun Oil of Pa. v. M/T Mercedes Maria, 1983 AMC 718, 725 (E.D. Pa. 1983),* rev'd, *771 F.2d 805 (3d Cir. 1985).*

n141. See *Sun Oil Co. of Pa. v. M/T Carisle, 771 F.2d 805, 813-15 (3d Cir. 1985)* (holding the customary trade allowance invalid as an automatic limit on liability).

n142. See, e.g., *Wesco Int'l, Inc. v. M/V Tide Crown, 1985 AMC 189, 201 (S.D. Tex. 1983)* (granting defendant a damage offset of 0.5% for customary trade allowance).

n143. See, e.g., *S.T.S. Int'l, Ltd. v. Laurel Sea Transp., Ltd., 932 F.2d 437, 440 (5th Cir. 1991)* ("We believe the more flexible rule of allowing the fact finder to consider all relevant and reliable evidence is the better rule."); *New England Petroleum Co. v. O.T. Sonja, 732 F. Supp. 1276, 1282 (S.D.N.Y. 1990)* (considering the amount of clingage as part of the facts and circumstances surrounding the case).

n144. See *New England Petroleum Co., 732 F. Supp at 1279* (taking into account vessel experience factor (VEF) in determining liability for cargo shortage). See generally Sivaraman, supra note 117 (discussing use of VEF); Bruce, supra note 117 (providing results of initial VEF studies).

n145. See Marvin A. Chirlstein, Concepts & Case Analysis in the Law of Contracts 147-52 (2d ed. 1993) (providing a succinct discussion on the contractual obligation to mitigate damages). See generally Sturley, supra note 83.

n146. See COGSA 4(2)(m), *46 U.S.C. app. 1304*(2)(m).

n147. See Gilmore & Black, supra note 145, at 164-65 (discussing clauses paramount and their application in maritime bills of lading).

n148. See, e.g., *Wesco Int'l, Inc. v. M/V Tide Crown, 1985 AMC 189, 193 (S.D. Tex. 1983)* (clarifying contract terms, in the absence of a clause paramount, through the rejection of defendant's argument that the "action involves private carriage pursuant to a charter party agreement, and, thus the Carriage of Goods by Sea Act ... does not apply, thereby showing that the structure of contracts needs clarification given the existence of COGSA").

n149. See Gilmore & Black, supra note 145, at 164-65.

n150. See Charles Debettista, The Bill of Lading as a Receipt - Missing Oil in Unknown Quantities, 1986 Lloyds Mar. & Com. L.Q. 468, 469 (discussing evidentiary problems with oil shortage claims with respect to measurement tallies maintained in the bill of lading).

n151. Id. at 475.

n152. Compare Part II, 15(a) TEXACOVOY 94 - Tanker Voyage

Charter Party, reprinted in 2C Benedict on Admiralty: Carriage of Goods by Sea Act, Law and Commentary/Forms and Clauses 17-202 (John C. Koster ed., 7th ed. Revised 2000), with Part II, 18(b) EXXONVOY 90 - Tanker Voyage Charter Party, reprinted in Benedict, supra, at 17-64.2(23) (both stating that the cargo becomes the responsibility of the carrier when the cargo reaches the vessel's permanent hose connection).

n153. See, e.g., Elcapitaine Inc. v. Tradinaft S.A., SMA No. 2549 (Mar. 3, 1989) (Arnold, Arb.) (noting that courts and arbitration panels will only disregard ship-borne measurements if they are clearly erroneous).

n154. See, e.g., Esso Nederland v. M/T Trade Fortitude and

Marastro Compania Naveria, S.A., 1977 AMC 2144, 2148 (S.D.N.Y. 1977) (comparing the ullage measurements taken while cargo is on the ship at the two ports, rather than comparing measurements involving any ship-to-shore transfers to determine the extent of carrier liability for loss).

n155. See, e.g., *S.T.S. Int'l v. Laurel Sea Transp., Ltd., 932 F.2d 437, 440 (5th Cir. 1991)* (discussing historically accepted calculations for the customary trade allowance, including those for evaporation and measurement errors).

n156. See, e.g., *Esso, 1977 AMC at 2148* (comparing the ullage measurements taken while cargo is at the two ports rather than comparing the measurements involving ship-to-shore transfers to determine the extent of carrier liability for loss).

n157. See *New England Petroleum Co. v. O.T. Sonja, 732 F. Supp. 1276, 1279 (S.D.N.Y. 1990)* (taking into account defendant's letter of protest over bill of lading figures).

n158. See Sun Int'l, Ltd. v. Salonica Trust Corp., SMA No. 3291 (Aug. 20, 1996) (Bulow, Arb.) (describing "no-shift" cargo handling provision).

n159. See *New England Petroleum Co., 732 F. Supp. at 1284* (discussing liability for loss due to low pour-point cargo temperature).

n160. See, e.g., id. (noting that when the defendant had sought to relieve itself from liability for the portion of the cargo it could not deliver, relief was denied because the cargo was unpumpable due to the defendant's negligence in transporting and discharging the cargo).

n161. See *id. at 1284-85* (holding shipper not liable for loss due to low temperature when temperature was not specified in contract).

n162. See Thomajan, supra note 20, at 237 (elaborating on cargo retention clauses).

n163. See Thomajan, supra note 20, at 237.

n164. See, e.g., *New England Petroleum Co., 732 F. Supp. at 1284* ("Once the defendant raises the defense of inherent vice, the burden shifts back to the plaintiff, to prove by a preponderance of evidence, that ... the damage was caused by the carrier's negligence."); Sun Int'l Ltd. v. Salonia Trust Corp., SMA No. 3291 (Aug. 20, 1996) (Burlow, Arb.) ("Under the Carriage of Goods by Sea Act, after a prima facie case of cargo loss has been made, [the carrier] has the burden to explain the cause of the loss and prove that it was not the result of any negligence or lack of due diligence on its part.").

n165. See, e.g., J. Weale, Claims for Short Delivery of Bulk Oil Cargoes: Some Recent Trends, 3 Lloyds Mar. & Com. L.Q. 405, 418 (1978) (indicating that an independent surveyor can never really be considered independent when receiving pay from one party or another).

n166. See, e.g., Clayton Tankers, Inc. A/S v. Trading Corp. of Pakistan, Ltd., SMA No. 2796 (Sept. 20, 1991) (Siciliano, Arb.) ("It certainly would have been helpful had the parties appointed an "independent' surveyor to resolve the question of the quantity and pumpability of the cargo remaining aboard.").

n167. See Longaker, supra note 12, at 1241 (arguing that the customary trade allowance is reconcilable with COGSA); Staples, supra note 12, at 200 (arguing that trade allowance relieves carrier of liability pursuant to COGSA).

n168. See *Sun Oil Co. of Pa. v. M/T Carisle, 771 F.2d 805, 808 (3d Cir. 1985)* (noting Sun Oil's attempts to negotiate a 0.25% customary trade allowance contract provision but holding customary trade allowance invalid).

n169. See *id. at 809* (stating that a contract term limiting a carrier's liability is prohibited by COGSA).

n170. See, e.g., *Cincinnati Miclacron, Ltd. v. M/V American Legend, 784 F.2d 1161 (4th Cir. 1986),* rev'd en banc, *804 F.2d 837 (4th Cir. 1986).*

n171. See Gilmore & Black, supra note 145, at 133 (discussing carrier's obligation to properly care and deliver cargo).

n172. See COGSA 4, *46 U.S.C. app. 1304* (discussing burden of proof for carrier and ship).

n173. Bargaining power must be viewed in light of changed developments in the oil industry. Many corporations such as Mobil maintain their own fleet of tankers. See Press Release, supra note 22 and accompanying text. Consequently one may consider bargaining power between shippers and carriers as much more balanced then during the era of the Sun Oil ruling. But see *Sun Oil Co. of Pa, 771 F.2d at 809* (indicating that carriers had the upper hand in negotiating maritime contract terms with respect to the incorporation of the customary trade allowance provisions).

n174. See, e.g., *Sun Oil Co. of Pa., 771 F.2d at 808* (noting Sun Oil's failed attempts to negotiate a 0.25% customary trade allowance contract provision).

n175. But see Berto, supra note 15, at 68 (highlighting the inaccuracies of API's previous cargo conversion tables).

n176. See generally Clark, supra note 8 (noting that although most arbitrators will permit the customary trade allowance, they reduce the amount to the factual circumstances of each particular case).

n177. See, e.g., *Ingalls Iron Works v. Freuehauf Corp., 518 F.2d 966, 969 (2d Cir. 1975)* (utilizing total facts and circumstances analysis in maritime setting); Altavista Navigation S.A. v. Metal Transp. Co. of N.Y., SMA No. 1687 (June 11, 1987) (Mordforst, Arb.) (looking to all the facts of a case, including witness testimony and review of documents).

n178. See Longaker, supra note 12, at 1241 (arguing that COSGA was not meant to overrule the traditional trade allowance); Staples, supra note 12, at 200 (arguing that the Third Circuit's holding is not mandated by COSGA).

n179. See *W.K. Webster & Co. v. Am. President Lines, Ltd., 1995 AMC 134, 135 (2d Cir. 1994)* (noting the defendant's attempt to vacate plaintiff's claim on grounds that the ruling arbitration panel chairman, Chairman Hennessy, worked in the legal sphere rather than a commercial sphere and was therefore unable to adequately decide on the commercial issues at hand).

n180. See *Sun Oil of Pa. v. M/T Mercedes Maria, 1983 AMC 718, 720 (E.D. Pa. 1983),* rev'd, *771 F.2d 805 (3d Cir. 1985)* (stating that bulk oil cargo measurement should be characterized more as "an art than a science").

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