oil-tight deck on a tankship fitted with double sides, and may not be suitable for application to the definition of HBL in the context of existing tankers. The Coast Guard believes that the definition of ''hydrostatic-balanced loading'' used in the NPRM should not be used. The IMO has finalized the guidelines concerning the implementation of HBL and modified the original definition. A factor of 1.0 replaced the original factor of 1.1. Consequently, the Coast Guard has used the definition of ''hydrostatic-balanced loading'' that is consistent with the guidelines developed by the IMO for the regulatory assessment in this SNPRM.

Another comment suggested the use of HBL combined with PL/spaces as an alternative to applying HBL to all tanks. The Coast Guard presents several combinations of PL/space and HBL in the regulatory assessment for this SNPRM and solicits comments on them.

One comment stated that 50 percent of all tankship collision damage is located above the waterline only; therefore, vessels should be required to load their side tanks only to the waterline level. The comment stated that if side tanks were filled using HBL procedures, and 40 percent of the cargo was carried in the side tanks, all spills due to grounding would be reduced by 40 percent in the case of a grounding. The Coast Guard's probabilistic oil outflow analyses, as described in ''Interim Guidelines for the Approval of Alternative Methods of Design and Construction of Oil Tankers Under Regulation 13F(5) of Annex I of MARPOL 73/78'' (IMO Marine Environmental Protection Committee's Resolution MEPC 37/14; December 23, 1994), of various measures, including HBL, is assessed in this SNPRM. Comments are solicited on the oil outflow reduction estimates achieved through HBL and the resulting costs associated with the reduction.

One comment suggested that the Coast Guard place a notation in 33 CFR 157, subpart G, that states that structural increases or modifications to the cargo area of a vessel may be necessary to apply HBL when a vessel receives cargo. Another comment stated that the high tensile steel used in some ships may not be suitable for the fatigue effects that could result from HBL. Other comments expressed concerns about using HBL because of the possibility of sloshing. The Coast Guard recognizes that when employing HBL, in some cases, it may be necessary to retrofit swash bulkheads or modify the vessel's structure to reduce the effects of fatigue. Prior to applying HBL, the owner or operator of a loading tankship would have to evaluate the effects of HBL on a tankship's cargo tanks and structure to determine if swash bulkheads or other modifications are necessary. The regulatory assessment in this SNPRM did not consider shipyard cost for the modifications needed to accommodate HBL. Comments are solicited on specific structural modifications and their anticipated added shipyard cost, if any, for HBL measures.

One comment expressed concern that HBL may raise the risk of spillage due to an increase in total sailings resulting from reduced unit cargo loading. The oil outflow benefit analyses summarized in this SNPRM does not directly account for the effects of increased traffic due to reductions in cargo carrying capacity. Another comment stated that the benefits for all structural measures were overestimated because they did not reflect the added risk of an accident due to an increase in traffic volume. Historical accident data was used to estimate how much oil is spilled annually as a result of accidents. Estimated cargo shutout from measures similar to Regulation 13G of Annex I of MARPOL 73/78 reveal that the resultant increase in tank vessel traffic would be 12 percent. While this traffic increase could also increase accident risk, it represents approximately a 2 percent increase in the total U.S. port deep draft traffic volume. It is reasonable to assume that this small increase in traffic volume would be offset by the accident reduction measures implemented through the Coast Guard's proposed Operational Measures (60 FR 55904; November 3, 1995.

One comment inquired as to whether a load line would be necessary to enforce the use of HBL. The Coast Guard did not propose any changes to the International Convention on Load Lines, 1966, within the NPRM. If an HBL requirement is deemed economically feasible, it could be enforced using a number of methods. A tankship's master could be required to ensure that the ullage measurement reports or other tank gauging reports are recorded, kept in the Oil Record Book, and available for examination. Additionally, a visual inspection of draft marks should be sufficient to determine if a vessel has employed HBL loading procedures. The Coast Guard requests comments on the best way to determine whether a vessel is in compliance with its HBL loading plans.

One comment stated that, for ultra large crude carriers (ULCCs) and very large crude carriers (VLCCs) operating at offshore terminals, the risk of grounding is limited; however, collision is the most likely accident to occur. The comment proposed that, for these vessels, a very safe method of operation would be to HBL only the side cargo tanks. The Coast Guard disagrees. For collisions, the use of PL/spaces is necessary to reduce oil outflow. HBL provides added oil outflow protection only in groundings. If a collision were to cause the side of a large tankship to be pierced and a cargo tank to be ruptured, the hydrostatic head, which acts in balance with the seawater, would be lost; thus, oil would flow out of the tank.

5. Alternative Measures

The Coast Guard received several comments which encouraged it to adopt alternative systems to reduce oil outflow. These include emergency rescue and emergency transfer systems, resilient membranes, vacuum and underpressure systems, independent tanks, and intermediate oil tight decks. Alternative measures to prevent oil outflow are viable in some applications. For the regulatory assessment in this SNPRM, specific alternative measures were not researched. Cost assessments for alternative measures vary greatly. While there are indications that some of these measures could be less costly than PL/spaces or HBL, they were not included in the regulatory assessment because none of them meet the benchmark equivalency for alternative compliance found in ''Guidelines For Approval of Alternative Structural or Operational Arrangements as Called for in Regulation 13G(7) of Annex I of MARPOL 73/78,'' Resolution MEPC.64(36) adopted on November 4, 1994. These guidelines include oil outflow criteria that must be met for certain damage assumptions and general operational and safety points such as exposure of the tanker to stress, creation of fire or explosion hazards, stability considerations, and loading requirements. The Coast Guard solicits comments on these alternative measures. Specifically, the Coast Guard requests comments on whether they meet or exceed the IMO guidelines, whether they have been submitted and approved by IMO's Marine Environment Protection Committee (MEPC), and whether they are economically and technologically feasible.

Four comments recommended that the Coast Guard include provisions for using alternative systems to provide flexibility in complying with the requirements for structural measures. One comment suggested that the Coast Guard adopt the recommendations of the National Research Council report entitled ''Tanker Spills: Prevention by Design,'' which encourages the adoption