

# Gulf Coast Mariners Association



P. O. Box 3589  
Houma, LA 70361-3589  
Phone: (985) 879- 3866  
Fax: (985) 879-3911  
www.gulfcoastmariners.org

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## COMPARATIVE REPORT: TOWBOATS IN CANADA & THE UNITED STATES

### SUMMARY ON TOWBOATS: EXECUTIVE SUMMARY GENERAL

The Marine Regulatory Directorate of Transport Canada contracted MIL Systems Engineering (MIL Systems) to carry out technical investigations relating to the comparison of regulations and accident statistics for United States and Canadian towboats, and the determination of regulatory philosophies behind these regulations.

The approach to the study involved the following tasks:

- a. The determination of regulatory requirements of Canadian and United States regulations applicable to the construction and operations of towboats;
- b. The comparison of the differences between the Canadian and United States requirements;
- c. The review of Canadian and United States philosophies with respect to the development and content of the regulations for vessels operating in the domestic trade;
- d. The review of Canadian and United States accident statistics for the vessels under review;
- e. The comparison of accident rates in the two countries;
- f. The selection of representative towboats for use as a basis for costing differences;
- g. The estimation of the cost of disadvantage (if any) to the Canadian Industry; and
- h. The provision of conclusions and recommendations based on the results of the study.

## CONCLUSIONS

The conclusions developed as a result of carrying out this study are summarized as follows:

1. The impact of low tonnage measurements on towboat regulations is not significant due largely to the lack of significant regulation of US vessels and lack of cut-off point for these regulations at a GRT of 100 Tons;
2. Major differences between the two countries' regulations for towboats were restricted to the following:

**Inspection** Canada has a requirement for annual inspection as well as four or five year and drydock inspections; US has no such requirements

**Arrangement** Specifically, Canadian requirements for watertight and/or weathertight closing appliances for crew access openings.

**Ventilation** Canadian requirements specify required air changes, closures, ducting material and duct routing. Not addressed in US regulations.

**Crew Accommodation** Canada has minimum headroom requirements; US does not. Also, Canadian regulations require gas tight bulkheads between Crew accommodation and machinery spaces/flammable stores.

**Lifesaving Equipment** Liferrafts and additional lifejackets are required only on Canadian towboats. Additionally, on the larger representative towboat an emergency boat is required on the Canadian vessel but not the US.

**Fire Protection Equipment** A fire pump is required on the Canadian smaller vessel (none required on the US vessel) and a powered fire pump is required on the larger Canadian vessel (manual pump is the minimum for the US vessel).

**Navigation Equipment** New US regulations put the US vessels at a cost disadvantage. They have requirements for magnetic compass, depth sounder and electronic position fixing equipment on both sizes of vessels. Canada does not require these except for the sounder on the larger

vessel.

Manning & Notwithstanding the recent Certification "toughening up" of US regulations with regard to manning and certification, Canada is still at a disadvantage primarily due to the requirement to carry a mate as well as a Master and, on the larger vessel, a Chief (Senior) Engineer (US can use a "lower" level of engineer).

Subdivision & Stability For both sizes of vessel, Canada has requirements for Collision bulkhead and Forward/Aft Machinery Space bulkheads; US has no such requirements. On the larger vessel Canada must meet certain load line requirements - the US standard vessel requires the same but the "T-boat" has no such requirements.

The largest single difference is due to manning. It should be noted that manning costs have been assumed (see Table 2.3.16). It is recognized that such costs are independently negotiated between personnel and towboat owner/operators and therefore, in reality, may differ significantly from the assumptions made by MIL Systems,

3. Overall cost differences for towboats disadvantaged Canadian vessels, with estimates ranging from \$18,000 to \$62,000 for acquisition costs and \$19,000 to \$74,000 for operational costs. Considering the small size of the vessels used for this comparison (13.1m and 24.4m), these costs are considered to be a large portion of total acquisition and operational costs;
4. The classification of United States towboats as "uninspected" vessels, in general, allows these vessels to operate virtually unregulated compared to their Canadian counterparts, which must meet strict regulations. However, recent US regulations, implemented as a result of a high towboat accident rate in the US, have imposed stricter requirements in the area of navigation equipment and manning/certification;
5. Towboat accident statistics varied widely considerably between United States and Canadian towboats. Accidents in the US normalized to Canadian accident rates ranged from as low as 12% of Canadian Groundings for vessels 5<GRT<15 (US Fleet size of 609), to almost 21 times Canadian groundings for vessels GRT>500 (US Fleet size of 418). US collisions, groundings, and strikings had a definite uptrend with increased GRT normalized to

Canadian values (see Table 3.7). Vessels 5<GRT<100 had four times more foundering in the US than Canada, and about twice as many floodings and capsizing of US vessels 100<GRT<500 than Canadian. Most other incidents were comparable between Canada and the United States with US statistics ranging from 27% for other damage (Canada has more ice damage etc.), to 123% for fire. The much higher incidence of collisions, groundings, and strikings would imply poor vessel operations in the US. This might be the result of poor seamanship, poor barge towing practices, or lower requirements for navigation equipment and watch requirements. As noted in 4. above however, US regulations have been, or are in the process of being, tightened up to address some of these issues. Accident statistics used in this report however, do not reflect updated regulations;

6. On average, about 2/2% of incidents in the United States for towboats are attributable to equipment failures leading to strikings, collisions, or groundings, indicating possible lack of maintenance, overloading, or inadequate inspection of critical systems. Some 800 incidents of material failures or loss of vessel control were reported between 1985 and 1993 for towboats in the U.S. of which over 25% lead to accidents involving collisions, groundings, etc. These 800 incidents, 75% of which are not included in the statistics given in Table 3.2 or 3.3 (only the 25% of incidents leading to accidents are included), reflect about 10% of other accidents quoted in these tables. It is noteworthy that the preamble to the recently promulgated US regulations (discussed above) indicates that over the period 1980 - 1991 about 60% of marine casualties for towboats were directly attributable to personnel error;
7. Differences in philosophies between Canada and the United States for regulatory development seem to be primarily restricted to the implementation of international regulations (IMO) to domestic fleets, where Canada uses this approach, the US develops its own requirements for vessels operating in US waters. Other important differences would include the allowance of towboats to remain "uninspected" under US regulations, while Canadian equivalents must meet strict regulatory requirements for inspections and certification; and
8. The regulatory development process for Canada and the United States reflects similar intents for input into the process from all interested parties, although the US system would seem to reflect a more open system of regulation, offering additional explanations and detailed rationale for new regulations and changes to existing ones.

## RECOMMENDATIONS

The following recommendations are made based on the findings of this study:

1. During the process of reviewing United States regulations it was noted that the U.S. system of issuing, tracking, and revising regulations seemed somewhat more open. Proposed rulings, and rulemaking revisions were clearly explained in terms of rationale and all comments were addressed and published, including the U.S. Coast Guard's acceptance or rejection of proposed changes from the public sector, as well as background of the process to-date. This approach made it extremely easy to pick-up a document for a U.S. rulemaking and know the background for the change, the rationale for it, and the actual regulations proposed. As Transport Canada's Marine Regulatory Directorate is presently revising its approach to the design of regulations, it might be useful to consider an approach similar to that used in the United States; and
2. The large variation between United States and Canadian accident statistics implies a very poor safety record for U.S. towboats versus their Canadian counterparts. The US now seem to have recognized this somewhat alarming accident rate by initiating more stringent regulations in the area of navigation equipment, manning and certification. There is no doubt these new regulations will reduce the current accident rate however, it remains to be seen whether the US accident rate will approach the low levels currently experienced in Canada. It is suggested that accident statistics be revisited in approximately two to three years to evaluate the effect of the new US regulations.