OPERATIONAL SAFETY
WITH RESPECT TO TUG USE

Basic safety approach

How can operational safety be achieved? There are different factors leading to safe tug use, and if one of these factors does not get proper attention or has not been handled carefully, operational risks increase and accidents will happen. The different factors are:

Safe tug operators (towing companies).
Safe tug and safe tug equipment.
Safe tug operations.
Safe working practices of pilots.

The four factors will be highlighted below.

Safe tug operators

Safe tug operators will take care of the following major aspects:

- Safe tugs.
- Well trained and experienced tug crews.
- Safe working schedules.

Safe tug and safe tug equipment

It is the towing company’s responsibility that their tugs are safe working tugs in the conditions and circumstances that can be expected in the relevant operating areas.
The tugs should comply with all relevant safety regulations. The tugs should in all aspects be safe tugs. This applies to:

- operational reliability of engines, propellers/thrusters, steering equipment, deck equipment, etc.;
- seaworthiness (if applicable);
- when rendering assistance;
- in case of engine/steering failures;

Other important aspects requiring serious attention are:

- stability and freeboard;
- tug performance;
- fendering;
- deck equipment;
- wheelhouse: ergonomics, radar, communication systems, engine and/or rudder controls, winch control, quick release system, switching between manoeuvring panels, optimal visibility from the wheel house, clear windows, lighting, back-up systems, etc.

More items can be added, of which several may depend on the work to be done by the tug.

The tug should furthermore be suitable for the tasks to be carried out. Winch, fairlead and towing hook constructions and foundations should be strong enough for the forces that can be expected. The same applies to tow lines. Appropriate safety factors should be taken into account.

If one of the aspects mentioned is not treated carefully, not in a safe and reliable condition and/or not maintained properly, problems and accidents can be expected.
Safe tug operations

A safe tug and safe tug equipment alone is not sufficient. Tug operations can only be carried out safely if the tug’s captain and crew have the right attitude, are well trained and have the right experience.

Towing companies therefore have the responsibility for suitable training programs and appropriate promotion systems. This is crucial for the safety of tug crews, the safety of the tug, as well as for the safety of the ships to be assisted, the environment and the port’s infrastructure.

The training should not just be general training, but also focussing on the specific tug - with its capabilities and limitations - the captain, mate and engineer are sailing on, and on the specific manoeuvres to be carried out, for instance escort manoeuvres. Proper tow line use as well as the use of the most suitable tow line lengths should be part of the training. Training in emergency procedures is another important item, e.g. in case of a failure of one of the thrusters, and in the use of back-up systems; furthermore in FiFi (if applicable), radar use, optimal communicating, first aid, etc.

Suction forces and turning moments working on a tug when operating in close vicinity to a vessel, often a cause for accidents, should be addressed during training, as should another important aspect, viz. safe speeds. These factors are of specific importance when passing or retrieving a tow line, when coming alongside a vessel at speed and when rendering assistance.

Much can be learned from accidents that have happened, even from accidents that happened in other ports around the world. If relevant, such studies should be included in the training. Below are references to where information can be obtained about tug accidents.
It should also be clearly understood that training is only as good as the instructor. The instructor should not only have the capability to train other people but should also have the right experience regarding the aspects he is training.

All these aspects are discussed in the `Interaction and Tug Safety` paragraph of reference [1].

The towing company should have a safety manual. Tug captains and crews should know the contents of it and should operate accordingly. For instance, doors and all openings on the weather deck should be closed during operations.

Tug maintenance is also an important factor to pay attention to.

Safe working schedules are a responsibility of the tug company as well. Tug crews should have sufficient rest in order to avoid accidents due to fatigue.

If a crew is well trained and has sufficient experience on a certain tug type, and fatigue does not play a role, towing operations can be carried out safely.

Training, including simulator training, has been dealt with on the training and simulator pages of the ITA web site. See also references [1, 2, 3].

Safe working practices of pilots

Three factors have been addressed. The last factor, safe working practices of pilots, is also important. Because pilots and tug masters work as a team, optimal communication between pilots and tug captains is needed.

The manoeuvres a pilot is intending to carry out will affect the assisting tugs. This can be a positive or a negative effect. A negative effect may include risks for the tugs.
To have the tugs performing to their best capabilities it is necessary for a pilot to have knowledge of the capabilities and limitations of the tugs. This applies in the first place to the ship’s speed while tugs are making fast, when rendering assistance and in foggy conditions. A pilot should know what safe ship speeds are for the attending tugs [1, 2]. Otherwise, the tug captains must tell him.

Safe speeds are also of importance to reduce the interaction effects between ship and tug. The lower the ship’s speed the smaller the forces and turning moments working on the tug due to the fact that the tug is operating in close vicinity to the ship. Interaction forces increase with the square of ship’s speed. This means that interaction forces at 6 knots are more than two times as high (!) as with a speed of 4 knots.

It is also important to keep the tug captains informed about ship’s propeller and rudder use. To be aware of propeller use is especially important for the stern tugs.

If the pilot has sufficient knowledge of the capabilities and limitations of the tugs, he is also able to place the tugs where they are most effective. Correct tug placement is an important issue in handling a ship effectively.

Finally, a pilot should have knowledge of how much tug bollard pull is needed. This is not always easy, particularly with high sided vessels in windy conditions.

With increasing tug power it becomes more and more important that a pilot has knowledge of the strength of the ship bollards and fairleads.

From the foregoing it can be seen that a pilot plays an important role with respect to safe tug use and operational safety.
Summary

In the first place, the right attitude is needed to achieve operational safety with respect to tug use. This applies to towing companies, tug captains, tug crews and pilots. One person or one party alone cannot achieve a high level of safety. It requires a combined effort of the parties involved, all with their own responsibilities, but with the same goal: Safety of Operations.

Safety of operations can only be achieved by building safe tugs, by training and experience, and by teamwork.

References


Web sites where information is published with respect to accidents:

http://maritimeaccident.org

http://listserv.crc.gc.ca/archives/marine-l.html  Canada
http://www.bst.gc.ca/  Canada
http://www.havkom.se/index-eng.html  Sweden
http://www.maib.gov.uk/home/index.cfm  UK (*)
http://www.odin.fm/  Russia
http://www.taic.org.nz/  USA
http://www.rvtv.nl/  New Zealand (*)
http://maritimeaccident.org  the Netherlands

(*) If your e-mail address is known at the institutes, a message will be sent in case a new accident report is available.

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ITA February 2010