TUG AND BARGE NAVIGATIONAL SAFETY: NAVIGATION BEST PRACTICE, SAFE WATCHKEEPING AND COLREGS COMPLIANCE

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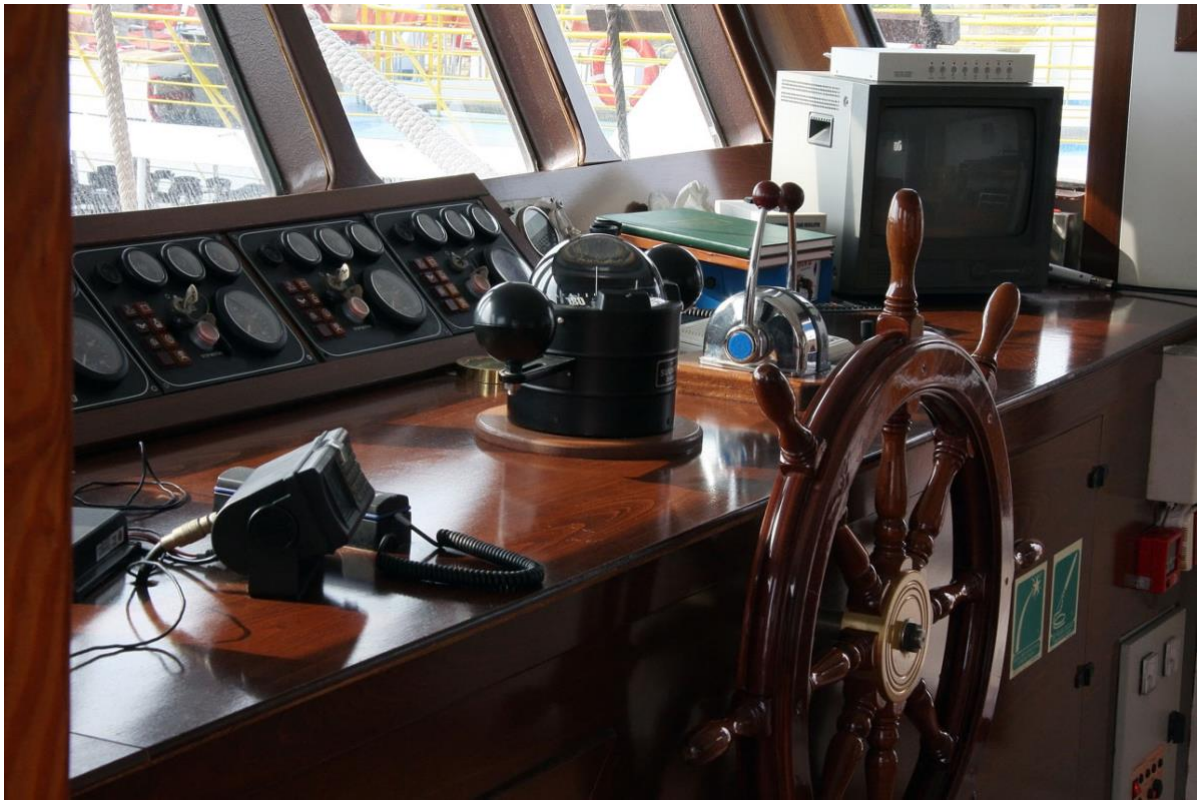

INTRODUCTION

Tug and cargo barge units are designed to provide low cost and uncomplicated water transport. The ton mile operating cost of such units is certainly economical. However, tug and barge operations present some complex challenges in relation to their navigational safety. The consequences of getting it wrong can be both severe and very costly.

MM RB's Nos. 31 and 32 were focussed on tug and barge stability and the necessity for stability awareness and regulatory compliance at the beginning and throughout all stages of a tug and barge voyage. This RB highlights the three interrelated elements of tug and barge navigation safety which are (1) Navigational Best Practice (NBP), (2) Safe Watchkeeping and the (3) International Regulations for Prevention of Collisions at Sea (COLREGS) compliance.

BACKGROUND

The essential connection between the three navigational safety elements is that they must be all be conducted correctly and simultaneously by a tug's navigational watchkeepers. If one or more of these elements fail, navigational safety will be impacted and the voyage may be at significant risk.

The STCW Convention requires tug officers to hold valid Certificates of Competency (COCs) which verify their safe navigation competence. Unfortunately, perhaps as a consequence of the more relaxed discipline often found on board tugs and small vessels, COC training and competence can be impacted by navigational complacency and 'human element' error.

So what can be done by Members to support and motivate tug and barge navigation safety through the careful and consistent application of its three interrelated elements on board their vessels?

NAVIGATION SAFETY AWARENESS

The first step is to ensure that tug and barge crews are provided with clear advice on their navigational safety obligations along with instructions on how this is to be accomplished. This information can best be provided as part of a flag state approved ISM Code or NCVS equivalent Safety Management System (SMS) and its supporting Safety Management Manual.

The SMS manual should include detailed procedures which explain the three elements of tug and barge navigational safety and the method of verifying that these procedures have been carried out for each and every voyage.

The second step is to ensure that the Member's internal audit of every tug's SMS includes the requirement to review the implementation of the three elements of navigational safety together with the Master and deck officers. Any amendments which may be required to improve these procedures should of course be made at this time.

As an assistance to Members, the three safe navigation element processes are summarised below.

1. **Navigational Best Practice (NBP)**

   Ensuring NBP outcomes for a tug and barge voyage requires the preparation of both a Tow Plan and Voyage Plan. These plans should be recorded either in writing or electronically and kept on board for flag state and/or port state control (PSC) inspection.

   - **Tow Plan –** should include, but not be limited to, the following checks and confirmations:
     - Tug is of suitable size, manning, sea-keeping, horse power (HP) and bollard pull (BP) for the tow and the voyage.
     - Tow line, towing bridle condition and all fittings and connectors are carefully checked to ensure Safe Working Load (SWL) and/or Breaking Load (BL) and their overall condition are within safe limits.
     - Spare tow line and towing bridle are available on board the tug and/or are pre-rigged as emergency towing gear on board the barge.
     - Towing hook or towing winch quick release devices are tested as fully operational before each and every tow connection.
     - Crew are mustered to a 'tool box' meeting and PPE (including PFD) check before each towline connection, adjustment and disconnection.
     - Tug and barge stability is adequate and meets regulatory compliance throughout the voyage.
     - Emergency/contingency plans have been prepared, inclusive of port of refuge details.
     - Voyage Plan, as detailed below, has been completed and approved by the Master.
   - **Voyage Plan** – should be based on, but not limited to, the advice provided in MM RB No. 27, Voyage Planning and should include the following checks and confirmations:

- All charts and navigational publications required (inclusive of ports of refuge) are on board and corrected and up to date, inclusive of any navigational warnings.
- Route to be taken clearly marked, including safe transit times (day/night transits), times when passing through narrows, under bridges or areas of high traffic density, tight bends in rivers and adjacent river berths.
- Areas of reduced depth, tidal limitations, currents expected and regulatory speed requirements during the voyage to be clearly noted.
- List of bridges with maximum and minimum heights adjusted for tidal range tide height at expected time of transit to be available.
- Weather forecasts to include outlook for at least 48 hours.
- Confirmation of sufficient fuel, water and spares on board, inclusive of a weather delay reserve.
- Tug BP is sufficient to ensure that at all times during the voyage and conditions expected, the tug and barge unit (whether fully loaded or empty) will be able to maintain a safe course at a speed of not less than 2 knots over the ground while navigating in coastal, confined or shallow water.
  NOTE: The minimum speed requirement of 2 knots on a safe course is based on the recommendation made by Class DNV Towing Recommendations at Para. 3.2 Minimum Bollard Pull of Tug. MM endorses this industry best practice recommendation.

2. **Watchkeeping to STCW Standards**

Watchkeeping should be conducted in compliance with the STCW Code, Chap. VIII, Section A – VIII/2 and Section B – VIII/2 or with the tug's flag state NCVS equivalent regulations. These regulations provide a detailed list of navigational watchkeeping obligations. The requirements which are particularly relevant to tug and barge watchkeeping are summarised as follows.

- A proper lookout must be maintained by sight, sound and all means appropriate (e.g. VHF, AIS and Radar) at all times in accordance with COLREGS Rule 5.
  NOTE: It is accepted that on board tugs and smaller vessels, the person steering

may also act as the lookout provided that weather conditions, visibility, traffic density and proximity to danger make it safe to do so.

- The officer in charge of the navigational watch (OOW) must check the course steered, speed and position at frequent intervals using all navigational aids available.
  NOTE: This means that there must not be total reliance on GPS positions and speed indication alone and this must be double checked by radar and visual observations.
- The OOW shall, by taking compass or radar bearings in accordance with COLREGS Rule 7, ascertain whether risk of collision with other vessels exists. If such risk exists, the OOW must take early and positive action to avoid collision.
- The OOW shall use the radar (set to an appropriate range scale) at all times in restricted visibility or when in congested waters.
- The OOW shall notify the Master immediately if restricted visibility is encountered or if vessel traffic or other circumstances are causing concern.
- The OOW shall monitor the proper operation of both the tug's and barge's navigation lights throughout the watch.
- When a pilot is on board, their presence does not relieve the Master or OOW from their watchkeeping duties including keeping a proper lookout, the regular plotting of the tug's position and the obligation to take back the conduct of the tug immediately if the pilot's actions cause concern.

3. **COLREGS Compliance**

The COLREGS Part B – Steering and Sailing Rules 4 through 19 detail the obligations of vessels approaching one another in both clear and restricted conditions of visibility. Space does not permit a full review of all of these Rules within the context of their application to tug and barge towing situations. However, some of the principal concerns relating to past tug and barge collisions with other vessels are listed below:

- **Rule 5, Lookout**, has already been referred to above as an integral part of element 2. Watchkeeping. In particular, it is essential that a visual lookout be maintained at all times in conjunction with reference to radar, AIS and ECDIS (if available) displays.
  NOTE: Time and time again, collision investigations reveal that poor lookout and an associated lack of situational awareness has been a primary causative factor. As

such, a dedicated and continuous visual lookout through the bridge windows must always be maintained.

- **Rule 9, Narrow Channels,** provides that a tug and barge unit proceeding along a narrow channel must, so far as it is safely practicable, keep to the starboard side of the channel or fairway.
  NOTE: It is accepted that obstructions or shallow areas in a channel may necessitate a derogation from Rule 9 in order to transit such areas. However, this must be accomplished with extreme caution and only after ensuring that all other vessels and tug and barge units in the area are alerted by whistle warning signals and VHF communications.

- **Rule 13, Overtaking**, provides a that any vessel, including a tug and barge unit, which is overtaking any other shall keep clear of the overtaken vessel.
  NOTE: The most frequent problem experienced by vessel's OOW is to ascertain whether his vessel is overtaking i.e. 'coming up with another vessel from a direction more than 22.5º abaft the other vessel's beam'. This can be assessed visually or, more accurately, by using a radar plot or AIS data. If there is any doubt, Rule 13, Para (c) obligates the OOW to keep clear of the other vessel. Regrettably, this 'stand on' vessel obligation to take action is frequently forgotten.

- **Rule 14, Head-On Situation,** provides that when two power driven vessels – including tug and barge units – are meeting head-on or nearly head-on so as to involve a risk of collision, then each shall alter course to starboard so as to pass on the port side of the other. By reference to the red sidelights situated on the port side of each vessel, this is known as a COLREGS compliant 'red to red' pass.
  NOTE: Head-on collisions are easy to avoid if each vessel complies with Rule 14 and alters course to starboard. What should always be avoided are situations in which vessels communicate with each other by VHF and agree to pass 'green to green'. This COLREGS derogation has led to scenarios where one vessel OOW panics at the last moment and then alters course across the bow of the other vessel in an attempt to pass 'red to red'. A collision often results and the deliberate and causative contravention of Rule 14 will increase the culpability of both vessels.

- **Rule 15, Crossing Vessel,** provides that when two power driven vessels – including tug and barge units – are on crossing courses, then the vessel which has the other on her own starboard side shall 'give way'. If, as required by Rule 8, this action is taken early, it is normally accomplished by the 'give way' vessel altering her course substantially to starboard towards a point astern of the 'stand on' vessel. It may

also be necessary to reduce the speed of the give way vessel.
NOTE: Many crossing vessel situations have turned into collisions because the 'give way' vessel does not give way early enough or at all. The Master or OOW of the 'stand on vessel' then wastes precious time by repeatedly calling the give way vessel on the VHF. Instead, Masters and OOWs must apply Rule 17, Action by Stand On Vessel, which provides that they must take action as soon as it becomes apparent that the give way vessel is not taking appropriate Rule 15 action. Failure to do so will increase the apportionment of liability to the stand on vessel as the courts do not approve of the use of VHF radio over the immediate obligation to follow the Rules and take action.

CONCLUSION AND TAKEAWAY

Navigational safety on board all vessels should always be paramount to risk management and the avoidance of loss. In relation to tug and barge units, this requirement, is often more difficult to accomplish as a consequence of smaller crews and the inherent problems related to towing heavily laden barges in confined waters and often strong current conditions.

A strong safety culture in any organisation starts at the top. MM tug and barge unit Members are therefore encouraged to review the current navigational safety practices on board their vessels. As part of this process, Members should ensure that their Masters and crews are provided with SMS manuals and procedures which support and motivate the implementation of the three elements of navigational safety which have been summarised in this Risk Bulletin.