MARITIME RESOURCE MANAGEMENT (MRM) IS A MARITIME INDUSTRY TRAINING PROGRAMME, AIMED AT PREVENTING INCIDENTS CAUSED BY HUMAN FACTORS. THE OBJECTIVE IS TO MOTIVATE THE TEAM TO CHANGE ITS BEHAVIOUR TO GOOD RESOURCE MANAGEMENT PRACTICES DURING EVERYDAY OPERATIONS. MRM IS HUMAN FACTORS TRAINING, FOCUSING ON NON-TECHNICAL SKILLS – ALSO CALLED SOFT SKILLS.

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BRIDGE RESOURCE MANAGEMENT (BRM)

The genesis for this type of training was in the aviation sector, when it became clear that despite technological improvements, human errors in the cockpit were the leading cause of some of the deadliest air accidents. These accidents were attributed to a failure to detect and stop a developing error chain, or a loss of situational awareness.

Since then, a number of industries have adopted similar programmes. The maritime version called Bridge Resource Management (BRM) was launched in 1993. The programme evolved through the years, to match industry challenges such as the ever-increasing cultural diversity of seafarers and the complexity of team interactions. In 2003 the programme was renamed Maritime Resource Management (MRM) to encourage participation of all target groups including masters, deck officers, engineers, maritime pilots and shore-based personnel. Alongside BRM, Engine Room Resource Management (ERM) is the twin programme focused on the engine room team.

The 2010 Manila Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), fully implemented from 1 January 2017, introduced specific requirements for officer training in bridge/engine resource management, leadership, teamwork and managerial skills.

BRIDGE RESOURCE MANAGEMENT (BRM)

In order to meet these requirements, individuals must demonstrate their knowledge by having had approved BRM or ERM training, approved in-service experience, or approved simulator training. Many national administrations will only accept an approved course for this purpose.

'TO ERR IS HUMAN, BUT TO PERSIST IN ERROR IS DIABOLICAL'

THIS LATIN SAYING SUMMARIZES THE SPIRIT OF WHAT BRIDGE RESOURCE MANAGEMENT IS INTENDED TO PREVENT. AS HUMANS, WE ALL ARE PRONE TO MAKE MISTAKES, WHICH UNFORTUNATELY ON OCCASION CAN LEAD TO INCIDENTS UNLESS CAUGHT AND CORRECTED IN TIME. BRM AIMS TO REDUCE THIS RISK BY HELPING THE BRIDGE TEAM TO FORESEE AND CORRECTLY RESPOND TO THEIR SHIP'S CHANGING SITUATION AND THEREFORE PREVENT A NAVIGATIONAL INCIDENT FROM ARISING.

Table A-II/1 of the STCW Code lists the following key principles of BRM:

● Allocation, assignment, and prioritization of resources
● Effective communication
● Assertiveness and leadership
● Obtaining and maintaining situational awareness
● Consideration of team experience

Let us have a closer look at the critical elements of BRM.

ALLOCATION OF RESOURCES
The key part of BRM is the ability to use all available resources effectively to make the best possible decisions. As an example, human resources available on the bridge include lookouts, additional officers, marine pilots and even vessel traffic system (VTS) officers. Technical/information resources include the passage plan, charts, navigation equipment and radio etc.

To enable optimal decision-making, the resources need to be available in good time and used to their full potential. This can be achieved through foresight and planning, for example by including the appropriate manning level and operational task responsibilities in the passage plan.

The passage plan and bridge procedures may not provide a solution for every possible scenario in a changing environment. Good BRM skills achieved through training and experience are also required for the optimal assignment and prioritization of resources, in particular in dynamic situations of increased complexity. For example, tasks should be continually delegated between team members so that all relevant information is understood and communicated.

COMMUNICATION AND TEAMWORK
An essential component of good BRM requires the team to be able to work together and communicate effectively. Information should be understood, acknowledged and clarified if needed. The principles of BRM can and should extend beyond the bridge, where the information flow is critical for correct decision-making – for example, communication with tugs and mooring stations.

Closed-loop communication helps eliminate errors and mistakes. When repeating orders to acknowledge them, good practice is to assess an order to make sure that it makes sense. It is the duty of all officers and crew members to cross-check and cross-question.

Effective BRM requires assertiveness. PACE is one of the models that can be used to escalate levels of intervention as part of the effective implementation of BRM:

PROBE:
"Do you know that...?"

ALERT:
"Can we re-assess the situation...?"

CHALLENGE:
"Please stop what you are doing while..."

EMERGENCY:
"STOP what you are doing!"

It is also important to maintain the common onboard working language and standard marine phrases in team communications, for example by using the IMO Standard Marine Communication Phrases (SMCP). This is particularly important when communications are required with external parties, such as marine pilots and tugs.

DECISION MAKING

Good team interactions and communication leads to good decision making: it is essential to gather relevant and valid information before making a deliberate and purposeful decision.

It should always be clear who in the bridge team has the overall responsibility for the decision making. However, it is equally important that all members of the team stay alert and actively follow the progress of the ship. If a team member identifies a potential error or a deviation from the agreed plan, he/she should not hesitate to challenge in a timely manner and confirm that the responsible officer is aware. BRM practices should include a means of verification to detect a slip or memory error, e.g. cross-checking or callouts.

SITUATIONAL AWARENESS

On the bridge, situational awareness is critical for safe navigation and collision avoidance. Situational awareness can be succinctly and simply defined as "knowing what is going on around us" (Flin et al, 2008). However, many casualty investigation reports cite loss of situational awareness as one of the contributory factors.

Ideally, every team member should have good situational awareness. On a busy bridge, it may be necessary for the officer in charge to delegate tasks to team members to focus solely on navigation, lookout, communication etc. In such cases, team members need to communicate effectively to share the "mental image" of the situation. All relevant resources, including navigation equipment and external information such as VTS, should receive appropriate attention from the team to achieve situational awareness.

CHALLENGE AND RESPONSE

An appropriate "Challenge and Response" technique is at the core of good BRM. A meaningful challenge to any action or non-action should be respected and considered, regardless of who is challenging whom.

Another significant aspect influencing the effectiveness of BRM is the "power distance", which in the context of BRM can be described as a measure of how often subordinates are afraid to raise concerns or express disagreement. "Power distance" is strongly influenced by cultural background and it needs to be correctly managed in order to ensure that bridge communication is effective.

SUMMARY

Although shipping is considered as one of the safest modes of transportation, casualties continue to occur due to human error and poor leadership. Procedures do not replace soft skills. Good BRM is not a one time training requirement but a team skill, which should be continually practised and rehearsed and, of course, implemented.

REFERENCES:

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• AMSA Marine Notice 11/2016 'Bridge Resource Management (BRM) and Expected Actions of Bridge Teams in Australian Pilotage Waters'

• AMSA Marine Notice 14/2017 'Fitness for Duty'

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• International Chamber of Shipping 'Implementing an Effective Safety Culture'

• Flin R, O'Connor P, Crichton M. (2008), Safety at the Sharp End: A Guide to Non-Technical Skills. Boca Raton, FL: CRC Press.