



Recommendations on Bridge Resource Management Courses for Maritime Pilots (BRM-P)

Introduction

Bridge Resource Management (BRM) generally refers to practices employed in the management of bridge operations to maximise the effective utilisation of all resources, including personnel, equipment and information, available for the safe navigation of the ship. The essence of BRM is a safety attitude and management approach that facilitates communication, cooperation, and coordination among the individuals involved in a ship's navigation.

BRM is widely accepted as a best practice for ship navigation, and training in BRM has become a staple of the maritime industry. Pilots around the world have been strong proponents of BRM and, in a number of countries, have modified BRM concepts and training to address the particular demands and challenges of compulsory pilots who are not members of a ship's crew. Recognising the interest of pilots and pilotage authorities in BRM training, the International Maritime Pilots' Association offers the following guidelines for BRM courses for Pilots (BRM-P).

Background of BRM

BRM was derived from Cockpit Resource Management (CRM), which was developed in the aviation industry during the late 1970's and early 1980's. Research in that industry had shown that despite improvements in cockpit instrumentation and expanded use of simulator training, human error continued to be a leading cause of commercial plane accidents. Many of those accidents were attributed to a loss of situational awareness and a failure to detect developing error chains by the crew. The industry concluded that a different management approach in the cockpit, one that featured better coordination and communication among the crew, could reduce human error. That approach became known as CRM, and training in CRM concepts became an aviation industry standard.

By the late 1980s, several studies of marine accidents as well as a number of casualty investigation reports suggested that many of the CRM concepts might also have benefits for ship navigation. It was noted, for example, that many of the human errors found to have been a cause of ship accidents were due to poor "management" rather than poor shiphandling or a lack of knowledge or skill. Causal factors attributed to poor management included confusion, poor decision making, preoccupation with non-critical problems, inadequate leadership skills, bad teamwork, and stress and fatigue.

In response, mariner training providers began developing Bridge Resource Management courses. These BRM courses borrowed from the well-established CRM training programmes but recognised that there are substantial differences between navigating a ship and flying an airplane and adapted CRM concepts to fit the maritime world.

BRM and the IMO

The 1995 amendments to the International Maritime Organization's Seafarers' Training, Certification and Watchkeeping Code (STCW) recommended that ship operating companies provide their masters and officers in charge of the navigational watch with guidance on proper bridge procedures and practices "based on bridge resource management principles." (95 STCW Code, B-VIII/2, part 3-1.)

In 2003, the IMO adopted Resolution A.960, which recommended that competent pilotage authorities should provide or require pilots to be trained in "bridge resource management with an emphasis on the exchange of information that is essential to a safe transit." (Annex 1, 5.5.3). The resolution further recommends that pilotage authorities provide, or require pilots to have, "refresher or renewal courses in bridge resource management." (Annex 1, 5.5.5).

The 2010 Manila amendments to the STCW replaced the previous recommendation for ship operating companies to provide BRM guidance to the deck officers with a new requirement that officers in charge of a navigational watch have knowledge of BRM principles. In order to meet this requirement, individuals must demonstrate such knowledge by having had approved BRM training, approved in-service experience, or approved simulator training. (STCW Code, as amended, Table A-11/1). Many national administrations will only accept an approved BRM course offered by a training centre for this purpose.

The Need for BRM Courses Specifically Designed for Pilots

Most BRM courses include the interaction of the master and bridge team with the pilot, but these courses are designed for, and are primarily taken by, ship crewmembers, not pilots. These courses for ships' crews often address subjects, and may promote concepts, that are not only inapplicable to what pilots do on the bridge of a ship, but may even be contrary to good piloting practices. For example, BRM courses for ships' crews typically advocate the development of standardised routines and an adherence to a uniform, constant set of operational procedures, albeit one that encourages a greater team-oriented approach.

That may be effective for bridge crewmembers who have a similar training background and work in the same bridge operating system from day to day.

That is not the environment in which a compulsory, non-crewmember pilot works, however.

On each assignment, a compulsory pilot will typically encounter a different ship, different bridge equipment and lay-out, a different operating environment, a different set of navigation procedures, and a different crew (usually one with limited English language abilities) with varying skill levels and capabilities from what the pilot encountered on the previous assignment. In most pilotage areas, the compulsory pilot is also expected to exercise independent professional judgement, which may on occasion conflict with the intentions of the ship's operator or master.

Because of those circumstances, pilots need to assess quickly the nature and quality of the resources available for each pilotage assignment and then adjust their practices to get the most out of those available resources. This calls for flexibility and adaptability rather than rigid adherence to a standardised routine.

BRM courses for pilots should therefore address strategies and techniques for evaluating the capabilities of the ship's crew and equipment and then establishing and maintaining

the best, mutually supportive working relationship with the bridge team in light of those capabilities. These are not alien or radical ideas for pilots. In fact, pilots have been routinely doing these things for many years – long before BRM was ever recognised as a concept. In traditional hands-on training under the guidance of senior pilots, junior pilots learn about effective communication techniques, bridging cross-cultural barriers, and productive interaction with bridge watch personnel.

IMPA recommends that such BRM training courses for pilots meet the following:

Recommendations

1. The course should be designated as a Bridge Resource Management for Pilots (BRM-P) course.

A BRM-P course should be separate and distinct from a BRM course offered for ships' crews. The course should focus on the functions, tasks, experiences and needs of pilots. In particular, the course should address the special problems involved in working on different types of ships and communicating with ship personnel from many different countries and cultures and with varying degrees of English language skills, training (including BRM training), qualifications, and commitment to safety.

2. Objectives of the Course.

In general terms, the objective of the course should be to help pilots use the skills and training they already possess in ways that maximise the safety performance of all the individuals on the bridge. Specifically, the course should seek to have each participant gain the following:

- a. an increase in "situational awareness" skills;
- b. an improved ability to foresee and prevent potential errors and to detect developing error chains in order to intervene before an accident becomes unavoidable (error trapping);
- c. a more developed concept of the appropriate roles of teamwork and leadership in the navigation of a ship;
- d. a greater regard for the importance of communication, an understanding of the common barriers to effective communication, and an awareness of how BRM practices can improve communication; and
- e. an enhanced ability to evaluate quickly the resources available for each pilotage assignment and to adjust practices to utilise those resources most effectively.

3. Length of the Course.

The course should be at least two days (14-16 hours) An acceptable course might be expanded beyond two days or be offered in conjunction with training in other areas of professional development or with different instruction methods, provided that the focus of the course remains on BRM concepts applicable to piloting.

4. Curriculum

The course should include instruction/training in the following subject areas:

- a. situational awareness
- b. error chains (error detection and error trapping)
- c. human factors
- d. dynamics of group performance
- e. special problems in pilot-bridge team interaction/coordination
- f. communication and communication skills
- g. command/leadership skills.

5. Class Size and Instruction Methods.

Because one of the primary focuses in a BRM-P course should be communication and inter-personal skills, class size should ideally be between 5 and 10 individuals. Interactive instruction methods, such as a "workshop" approach involving discussion groups, exercises, etc. are encouraged. Lecture-type instruction in which the instructor tells the pilot students how to pilot should be avoided.

Case studies from casualty reports are particularly appropriate for BRM programmes, but care should be taken to ensure that the discussion and analysis of cases retains the BRM focus. Pilot students should be encouraged to offer their own opinions as to the causes of the casualty, the quality of the pilot's performance, and measures to avoid whatever deficiencies in pilot performance may have been found.

6. Sponsors and Instructors.

An acceptable BRM-P course would be one offered by a recognised maritime academy, training centre, or other school or institute or individual engaged in the business of offering training and instruction to certificated marine officers. Instructors for BRM-P courses should have specific training in BRM concepts and teaching methods. At least one instructor in a course should not only possess instructional skills and ability to facilitate interactive discussion amongst the pilots, but also have experience as a pilot on large commercial ships.

7. Use of a Simulator.

A simulator is not necessary for a BRM-P course. Simulator exercises could be offered in conjunction with a BRM-P course, however. In addition, simulator exercises for pilots who have had BRM-P training or are in the process of receiving BRM-P training should involve practice in, and peer review of, a pilot's implementation of BRM-P concepts.

8. Renewal/Refresher Training

Consistent with the recommendation of IMO Resolution A.960 (see above), many pilotage authorities and pilot service providers require pilots to take periodic BRM-P renewal or refresher courses. It seems clear, however, that simply repeating a previous BRM-P course would not be worthwhile. Consequently there is a need for BRM-P training providers to develop and offer courses specifically designed for pilots who have already taken a BRM-P course, and IMPA would encourage the schools to offer separate initial and renewal courses. At a minimum, BRM-P course providers should ascertain the past BRM training of the course participants and adjust the renewal/refresher course accordingly, as discussed below

A renewal/refresher course should take a somewhat different approach than an initial course. For example, instructors in a renewal/refresher course should assume that the pilots in the course have an understanding of basic BRM concepts, such as situational awareness, error chains, and human factors affecting communication, cooperation and pilot-bridge team integration/coordination. As a result, those concepts can be reviewed, expanded, and updated with new information and theories, but there would be no need to repeat the exercises or case histories used to introduce those concepts.

A renewal/refresher BRM-P course should feature discussions of developments in the subject of BRM since the time of the previous BRM-P course as a result of accidents during that period, research in human factors affecting individual and group performance (in such things as fatigue and cultural and language barriers), developments in technology and information resources, and regulatory changes. For renewal/refresher courses, particular attention could be given to:

- a. Developments in technology and information resources, e.g.:
 - electronic charts, ECDIS, etc.
 - integrated bridge systems and new bridge lay-outs,
 - advanced shipboard navigation and control systems (such as auto- and track-pilot and azipod propulsion),
 - advanced tug designs (e.g., tractor tugs) and procedures;

- b. Incorporating the PPU into the pilot-bridge team relationship and other aspects of piloting;
- c. Research on fatigue, cognitive science, and other human factors;
- d. Regulatory requirements governing respective duties of master and bridge crew and pilot (e.g., STCW, SOLAS);
- e. New regulations possibly requiring a change in bridge procedures;
- f. Potential impact of changes to international (IMO) measures on the competence and operations of masters and bridge crews;
- g. Positions and proposals of other organisations on master-pilot interaction, bridge team management, bridge procedures with pilot aboard, etc;
- h. Casualty reports since the previous BRM-P course; and
- i. Revisiting IMO Resolution A.960

Although recent developments in BRM matters, such as research in human factors, changes in regulatory requirements, and technological advances, may justify more lecture-type instruction than would be advisable for initial BRM-P courses, a significant portion of a renewal/refresher BRM-P course should be conducted with interactive instruction methods and encourage discussion.

BRM-P and STCW BRM courses

Many pilots hold STCW endorsements and are, therefore, subject to the BRM training requirements of that code. A two-day BRM-P course may not qualify under a national administration's BRM course approval standards (among other things, many administrations require a 3-day STCW BRM course). Pilots and pilotage authorities wanting to use BRM-P towards the STCW BRM requirements should ask training providers to develop a combined course meeting both BRM-P recommendations and STCW standards.



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