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VOYAGE PLANNING

Summary. A sea voyage can be divided into three parts with varying degrees of risk:

- from the berth at the port of departure to the pilot disembarkation point
- from the pilot disembarkation to another pilot embarkation point near the port of call/destination
- from the pilot embarkation point to the berth

Results of statistical research into ship accidents at sea point to an increased number of incidents and accidents, including groundings, especially in restricted areas. Such areas are often narrow and have limited depths, while their short straight sections require frequent course alterations, often in varying hydrometeorological conditions. Due to all these factors, the voyage has to be carefully planned and all watchkeeping officers have to be well prepared to conduct the ship safely. The article presents the objectives, scope, legal basis and stages in the process of voyage planning. The compliance with the outlined principles will reduce the level of risk in maritime transport.

Keywords: safety of navigation; voyage; marine transport

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1. INTRODUCTION

Research into the causes of navigational accidents and maritime disasters in shipping has shown that the human factor is responsible for 80% of those events. It was also found that accidents would have been avoided if the persons responsible for ship conduct had appropriately utilized all available information. Most accidents occurred as a result of simple mistakes in the use of navigation equipment, as well as due to errors in interpreting the available information, as opposed to the lack of experience or proper qualifications. Statistical results for ship accidents indicate an increased number of casualties, including groundings in restricted water areas. These are often insufficiently deep and narrow, while their short straight sections require frequent course alterations. Besides, varying hydrometeorological conditions make the navigation even more challenging. All these factors require careful voyage planning and preparation of all watchkeeping officers to execute the voyage at sea.

2. PURPOSE, SCOPE AND LEGAL BASIS FOR VOYAGE PLANNING

A ship's voyage plan expresses the navigators' intentions and is a dynamic process, which can and must be updated taking into account changes in circumstances and conditions.

The main objectives of voyage planning are assumed to assure [1]:

- safety of life at sea
- efficient and safe navigation
- protection of the marine environment

Voyage planning should:

- cover all voyage stages from the moment of unberthing at the port of departure until berthing at the port of destination (berth to berth)
- be obligatory for all ships engaged on international voyages
- take into account all the factors affecting the safety of navigation in general, particularly the safety of large ships and ships carrying dangerous goods

The formal requirement to prepare a voyage plan results from the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 78/95), the International Convention for the Safety of Life at Sea (SOLAS 74) and four International Maritime Organization (IMO) resolutions: A.893 (21), A.790 (19), A.999 (25) A.1024 (26) and A.671 (16).

SOLAS 78/95 is the first convention addressing issues regarding safety of life at sea and applies to all ships engaged in international voyages. It was adopted on 1 November 1974 at an international conference convened by the IMO. The currently binding convention came into force on 25 May 1980; since then, it has been amended and supplemented repeatedly in the form of resolutions, circulars and attachments. The SOLAS Convention was preceded by treaties adopted in 1914 (following the Titanic tragedy), 1928, 1948 and 1960.

The SOLAS 78/95 Convention consists of 12 chapters. Chapter five, regulation 34, provides for safe navigation and avoidance of dangerous situations. It applies to all ships subject to the provisions of the aforementioned convention and encourages warships and sailing vessels, as far as is reasonable and practicable, to act according to the provisions of chapter five.

Chapter five recommendations are as follows [4]:

1) Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned, taking into account the guidelines and recommendations developed by the IMO
2) The voyage plan should identify a route which:
   - takes into account any relevant ships' routing systems
   - ensures sufficient sea room for the safe passage of the ship throughout the voyage
   - anticipates all known navigational hazards and adverse weather conditions
   - takes into account the marine environmental protection measures for avoiding, as far as possible, actions and activities which could cause damage to the environment

At the same time, chapter five, regulation 34-1, gives the master freedom to make and execute decisions that, according to his professional judgment, are necessary to provide for the safety of life at sea and the protection of the marine environment. The owner, charterer or operator of the ship, as defined in regulation IX/1, or any other person, shall not prevent or restrict the master in the listed activities.

In 1999, IMO's Maritime Safety Committee prepared a special resolution (A.893 (21), annexes 24-25), which forced the management of each ship to develop an appropriate and detailed plan and proper execution of the voyage according to plan.

Based on international regulations and good seamanship practices, it is generally assumed that the ship's master is the one who chooses the voyage route.

3. STAGES OF VOYAGE PLANNING

When planning the whole voyage or its passage in compliance with IMO resolution A.893 (21), the requirements include four main stages:

- appraising all relevant information related to the intended voyage (initial stage)
- detailed planning of the intended voyage (berth to berth), taking into account water areas, which require the presence of a pilot (planning stage)
- execution of the voyage (execution stage)
- monitoring the ship's movement during the voyage (monitoring stage)

3.1. Preliminary stage

At this stage, you must collect and analyse all relevant information related to the trip being prepared. The basic data include the following [3, 4]:

1) The condition and state of the vessel, its stability and equipment, operational limitations, its permissible draft in fairways and in ports, and its manoeuvring data including any restrictions.
2) Any special characteristics of the cargo (especially if hazardous) and its distribution, stowage and securing on board the vessel.
3) The provision of a competent and well-rested crew to undertake the voyage or passage.
4) The requirements for up-to-date certificates and documents concerning the vessel, its equipment, crew, passengers or cargo.
5) Appropriate scale charts to be used for the intended voyage or passage, as well as relevant "notices to mariners" and radio navigational warnings.

6) Accurate and up-to-date sailing directions, lists of lights and lists of radio aids to navigation.
7) All relevant additional information, including:

- mariners' routing guides and passage planning charts
- current and tidal atlases and tide tables
- climatological, hydrological and oceanographic data, as well as other appropriate meteorological information
- availability of services for weather routing
- ships' routing and reporting systems, vessel traffic services, and marine environment protection measures
- volume of traffic likely to be encountered throughout the voyage or passage
- when pilot service is to be used, information relating to pilotage and (dis)embarkation, including the exchange of information between master and pilot
- available port information, including information on available rescue centres

Based on the above information, an initial assessment of the intended voyage should be made. Such assessment should clearly identify:

- all dangerous areas
- areas where safe navigation is possible upon taking into account routing systems, traffic separation schemes, reporting systems and vessel traffic services
- navigable areas where particular care is required due to marine environment protection

3.2. Planning stage

On the basis of the fullest possible appraisal, a detailed voyage or passage plan should be prepared (berth to berth), including those areas where the services of a pilot will be used.

The detailed voyage plan should include the following main elements [2]:

- plotting of the intended route or passage on appropriate scale charts
- safe vessel speed in the vicinity of navigational hazards
- safe distance from navigational hazards
- required minimum under-keel clearance in tidal or limited depth waters
- method and frequency of position fixing appropriate to the area of navigation
- course alteration points, taking into account the vessel's turning circle
- use of ship routing systems and traffic separation schemes
- environmental protection issues
- contingency plans in case a ship has to head for another area, anchorage or port of refuge

The details of the voyage plan should be clearly marked and recorded, as appropriate, on charts and in a voyage plan notebook or computer disk. Each voyage or passage plan should be accepted by the ship's master before the voyage starts.

3.3. Voyage execution

The voyage execution, or ship conduct at sea, should take into account two important issues:

- evaluation and methods of risk control on each leg of the voyage

- effective bridge team management

For the captain, it is important to analyse and assess whether any special circumstances may occur, such as the forecast of restricted visibility in navigationally difficult areas. This may necessitate bypassing such an area or waiting for the hydro-meteorological conditions to improve in order to reduce the risk level.

3.4. Monitoring

Control of the voyage execution is an ongoing process aimed to ensure that the ship proceeds along a designated route in accordance with the voyage plan. The plan should always be available on the bridge.

A ship's movement along the designated route is controlled by continuous position fixing by the officer of the watch, using dead reckoning or terrestrial navigation methods. Any deviations from the voyage plan require the master's consent (excluding emergencies). Having waypoints included in the plan, the navigator can control the voyage progress by comparing planned and actual times of reaching those points. If correction is needed, it usually means an alteration in the ship's speed.

4. SUMMARY

The increase in the size and speed of ships has increased the risk of marine accidents and environmental disasters. Therefore, the IMO has made it mandatory to draw up voyage/passage plans, which represents a measure fully accepted by the maritime industry. To emphasize the importance of voyage plans in reducing the risk level in shipping, the IMO introduced inspections of vessels subject to the SOLAS Convention. The inspections are carried out by maritime administrators at the port where a ship happens to moor. The inspections cover such areas as the qualifications of the captain and officers, or the technical condition of the vessel. Port state control inspectors check whether the vessel complies with the requirements of international conventions, including all navigational safety issues.

Similar inspections are also carried out by inspectors of the flag state, classification society surveyors and the insurer's inspectors.

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