# BRITANNIA LOSS PREVENTION INSIGHT

SAFE PASSAGE PLANNING AN OVERVIEW FOR THE MARITIME SECTOR

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#### BRITANNIA LOSS PREVENTION TEAM

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The Club's loss prevention department has a wealth of varied seagoing and shore-based experience including many years working in P&I loss prevention. The team is based in both London and Singapore and works closely with our underwriting and claims team and, most importantly, our Members.

As a department we aim to provide prompt, credible and informative guidance to our Members to support their safe and efficient operations. This includes producing useful and practical publications, such as our award winning BSafe case studies and learning materials focusing on seafarer safety, health and security, as well as our new series of Loss Prevention Insight reports. We also run regular webinars addressing topical loss prevention issues. At any one time we have several research projects running, all aiming to reduce the number and frequency of claims by identifying existing and future risks. With the Loss Prevention team all being former seafarers, we understand how important and critical the provision of relevant information and training is to help ensure safe, efficient and claim-free vessel operations.

#### INTRODUCTION

A DETAILED PASSAGE PLAN IS AN ESSENTIAL PART OF ENSURING THE SAFE NAVIGATION OF A VESSEL AND A DEFECTIVE PASSAGE PLAN OR FAILURE TO EXECUTE A PLAN CORRECTLY HAVE OFTEN BEEN IDENTIFIED AS CONTRIBUTING FACTORS LEADING TO GROUNDINGS.

With the recent court rulings in the CMA CGM LIBRA case (http://ow.ly/LjIb30sc5me) which stated that a defective passage plan can render the vessel unseaworthy, this may have significant consequences with regards to a vessel's liability in the event of an incident, and highlights the importance of a robust and well implemented passage plan.

Preparing a detailed passage plan can be a substantial task which requires a systematic approach to ensure that all relevant information is assessed and included as applicable. This report provides an overview of some of the important factors and information to be considered when preparing a safe passage plan.

Firstly, there are three essential requirements under the Safety of Life At Sea (SOLAS) Convention that need to be complied with when preparing a passage plan as follows:

• **SOLAS V/19.2.1.4** which requires all vessels (irrespective of size) to carry the applicable nautical charts and publications to plan and display the vessel's route for the intended voyage and to plot and monitor positions throughout the voyage. An Electronic Chart display and Information System (ECDIS)<sup>1</sup> is also accepted as meeting this requirement.

<sup>1</sup> For further information on ECDIS please also see IMO MSC.1/Circ.1503/Rev.1 ECDIS – Guidance for good practice.

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# THE SHIPOWNER NEEDS TO IMPLEMENT ROBUST PASSAGE PLANNING PROCEDURES AS PART OF THEIR SAFETY MANAGEMENT SYSTEM (SMS).

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• SOLAS V/27 which states that all nautical charts and publications necessary for the intended voyage shall be adequate and up to date.

• SOLAS V/34 which requires the master to ensure that the intended voyage has been planned using appropriate nautical charts and publications for the area concerned, taking into account the guidelines and recommendations developed by the International Maritime Organisation (IMO), before proceeding to sea.

To ensure compliance with the above regulations the shipowner needs to implement robust passage planning procedures as part of their Safety Management System (SMS). These should cover the four phases of passage planning as defined by the IMO's **Resolution A.893(21) – Guidelines for voyage planning (http://ow.ly/oH3530sc5lT)** which are: Appraisal, Planning, Executing and Monitoring. Furthermore, these should also consider recognised industry best practices as required by the International Safety Management Code paragraph 1.2.3.1.





A QUALIFIED NAVIGATION OFFICER SHOULD BE ASSIGNED AS RESPONSIBLE FOR PREPARING THE PASSAGE PLAN FROM BERTH TO BERTH.

### APPRAISAL AND PLANNING OF THE PASSAGE PLAN

THE IMO'S GUIDELINES SHOULD ALWAYS BE TAKEN INTO ACCOUNT WHEN PREPARING A PASSAGE PLAN AND A QUALIFIED NAVIGATION OFFICER SHOULD BE ASSIGNED AS RESPONSIBLE FOR PREPARING THE PASSAGE PLAN FROM BERTH TO BERTH. The final plan should be approved by the master and reviewed by all of the deck officers prior to departure, so that all are familiar with the contents of the plan. It should be prepared on paper charts or ECDIS if equipped. When the vessel is equipped with a dual ECDIS configuration, the passage plan should be uploaded to both ECDIS terminals. If paper charts are used as a backup to the ECDIS, the passage plan should also be plotted on the paper charts and the vessel's position marked at frequent intervals, so that if the ECDIS fails, safe navigation can immediately and seamlessly be continued using the paper charts.

All information relevant to safe navigation during the voyage should be consolidated in the passage plan in an easy to use format. This should also consider any marine environmental protection measures that need to be complied with during the voyage. To assist the navigation officer with preparing the passage plan in a systematic manner and to mitigate the risk of any important information getting missed, it is recommended that a 'Passage Planning Checklist' is made available as part of the onboard SMS. Furthermore, the navigation officer should discuss the forthcoming voyage with the master, especially any concerns and certain points of the voyage that will require special attention to ensure safe navigation. It is recommended that the latest editions of the following list of publications and information, though not to be regarded as fully comprehensive, should be made available on board and be consulted as found applicable:

• LOAD LINE CHART – To determine the load line zone(s) for the voyage and the maximum draft to which the vessel can be loaded.

• **ROUTING CHARTS** – These include routes and distances between major ports, ocean currents, ice limits, load lines and wind roses. They also contain expected meteorological and oceanographic conditions for each month of the year.

• MARINERS' ROUTING GUIDES – These contain more detailed information on safe passage through some of the most densely trafficked areas of the world e.g., the Malacca and Singapore Straits and the Strait of Dover.

• **PORT APPROACH GUIDES** – Containing a wide range of information for some of the world's busiest ports, these charts can help simplify the planning of an approach and departure as details including navigational aids, port specific warnings and pilotage information is contained on one chart.

• NAVIGATIONAL CHARTS / ELECTRONIC NAVIGATIONAL CHARTS (ENCS) – To plot and display the planned track, whilst determining whether any displayed information on hazards needs to be highlighted as part of the passage plan.



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PACIFIC OCEAN

### • ADMIRALTY DIGITAL CATALOGUE -

Providing information on all Admiralty charts and publications, including (ENCs) and Temporary and Preliminary Notices to Mariners (T/Ps).

• CATALOGUE OF ADMIRALTY CHARTS AND PUBLICATIONS (NP131) – Detailing all available Admiralty charts and publications.

#### OCEAN PASSAGES FOR THE WORLD

(NP136) – Supports the planning of deep-sea voyages on most major routes, with details of weather, currents, ice hazards and distances between major ports as well as climate details for each ocean. Furthermore, trade routes and tabulated route data help ease extracting relevant information.

• ADMIRALTY DISTANCE TABLES (NP350 1-3) – Regional tables with supporting text and diagrams, providing the shortest distances between ports.

• SHIPS' ROUTING – Contains information on IMO adopted traffic separation schemes, two-way routes, deep water routes, recommended tracks, precautionary areas and areas to be avoided.

• SAILING DIRECTIONS (PILOT BOOKS) – Provide essential information to support port entry and coastal navigation for all types of vessels covering the majority of the world.

• THE MARINER'S HANDBOOK (NP100) – Contains important guidance to assist with passage planning, including bridge procedures, the use of nautical charts and restrictions to navigation.

• LIST OF LIGHTS – Provides light and fog signal information, including lit floating marks and other lights of navigational significance.

• LIST OF RADIO SIGNALS – Provides information on all aspects of maritime radio communications, assisting the bridge crew to manage communications and comply with reporting requirements throughout the voyage.

• **TIDE TABLES** – Provides height, timing and tidal stream information for planning departure and arrival times to ensure the vessel's safe passage.

• **TIDAL STREAM ATLAS** – Provides information on the direction and rate of tidal streams.

• GUIDE TO PORT ENTRY – Provides comprehensive and detailed information for nearly 15,000 ports worldwide. The information provided is essential for planning a safe port call and includes prearrival information, details of the documentation required by the port, maximum permissible size of vessel and cargo facilities. THE FINAL PLAN SHOULD BE APPROVED BY THE MASTER AND REVIEWED BY ALL OF THE DECK OFFICERS PRIOR TO DEPARTURE. • NAVIGATIONAL WARNINGS – Provide early information on activities or developments which may present a risk to safe navigation. Most navigational warnings tend to be of temporary character, but some remain in force for several weeks and may be succeeded by a Notice to Mariners (NtM). Navigational Warnings can be received in various ways, most commonly by Navtex or Inmarsat (EGCs – Enhanced Group Callings).

• WEATHER REPORTS/FORECASTS – Latest weather reports and forecasts should be obtained. A facsimile transmission can still be used for receiving weather charts, but most vessels today are able to receive these digitally from a weather routeing provider. These might also contain advice on a recommended safe weather route.

• ICE REPORTS – Information on ice areas, type and thickness, which in many areas are published online on a daily basis.

• **TEMPORARY AND/OR PERMANENT (T/P) NtMs** – Latest NtM to be consulted to ascertain which ones relevant for the voyage are still in force.

• ADMIRALTY ANNUAL SUMMARY OF NOTICES TO MARINERS (NP247(2)) – List of the current editions of Admiralty Sailing Directions and updates in force and a list of current editions of Admiralty miscellaneous nautical publications and updates in force.

• LOCAL NOTICES TO MARINERS – Local agents or representatives should be contacted in due course to obtain advice on any local notices on dangers to navigation which may not have been issued as a navigational warning or T/P NtM yet.

• LOCAL PORT INFORMATION – Local agents or representatives should be contacted in due course to obtain advice on any other relevant information at the arrival port(s).

• SYMBOLS AND ABBREVIATIONS USED ON ADMIRALTY CHARTS (NP5011) – Provides details on chart symbols and abbreviations used internationally. It also contains information on hydrography, topography and navigational aids and services.

• GUIDE TO ENC SYMBOLS USED IN ECDIS (NP5012) – Contains comprehensive information and detailed explanations of the traditional and simplified ENC symbols displayed in ECDIS. It also explains the factors affecting the display of ENC symbols.

• MARITIME SECURITY CHARTS – Containing critical safety and security information, these charts should be consulted, and their contents implemented so far as practicable, when planning and executing a passage through high risk areas where piracy, terrorism, or other security related perils may be encountered.

• LATEST EDITION OF BEST MANAGEMENT PRACTICES (BMPS) ON PIRACY AND SECURITY THREATS – Describes precautions and reporting requirements if transiting areas with a risk of piracy attacks e.g., Gulf of Aden and the Gulf of Guinea.



IT SHOULD BE VERIFIED THAT ADEQUATE NAUTICAL CHARTS AND PUBLICATIONS ARE ON BOARD COVERING THE ENTIRE FORTHCOMING VOYAGE.

#### ADEQUATE NAUTICAL CHARTS AND PUBLICATIONS

SOLAS V/2 DEFINES A NAUTICAL CHART OR PUBLICATION AS: 'A SPECIAL-PURPOSE MAP OR BOOK, OR A SPECIALLY COMPILED DATABASE FROM WHICH SUCH A MAP OR BOOK IS DERIVED, THAT IS ISSUED OFFICIALLY BY, OR ON THE AUTHORITY OF A GOVERNMENT, AUTHORIZED HYDROGRAPHIC OFFICE, OR OTHER RELEVANT GOVERNMENT INSTITUTION AND IS DESIGNED TO MEET THE REQUIREMENTS OF MARINE NAVIGATION.'

It should be verified that adequate nautical charts and publications are on board covering the entire forthcoming voyage. Furthermore, that these are issued by, or on behalf of, an authorised government institution. In cases where required charts or publications are not on board, the SMS should describe how new charts and publications can be obtained prior to departure.

Today ECDIS is commonly used as a vessel's primary means of navigation and ENCs will be the standard chart format. If it is not possible to obtain the required ENC, or one does not yet exist for an area to be traversed, a RNC (Raster Navigational Chart) can be used. However, the IMO's performance standards for ECDIS require that, when ECDIS is used in Raster Chart Display System (RCDS) mode, the system has to be used *'in conjunction with an appropriate portfolio of up-to-date paper charts'.* Where there is an intention to operate ECDIS in RCDS mode, the vessel's flag state should be consulted as some will need to issue approval and require the completion of a risk assessment. If no electronic charting options are available, then paper charts will need to be considered.

Where paper charts are still in use as the primary planning and monitoring tool, or as a back-up to the ECDIS, a full catalogue should be carried to cover the forthcoming voyage. It is recommended to have a subscription with a recognised nautical chart and publication supplier, which automatically sends the latest editions of the required charts/publications. For ECDIS they will normally be able to provide licenses for new charts by email. Be aware that some flag states require the supplier to be certified so this should be verified by the Member.

The International Hydrographic Organisation (IHO) provides an online chart catalogue that details the coverage of ENCs, together with references to Coastal States' guidance on any requirements for paper charts (where this has been provided). The catalogue also provides links to IHO Member States' websites where additional information may be found. The IHO online chart catalogue can be accessed from the IHO website at: **www.iho.int**  ALL NAUTICAL CHARTS AND PUBLICATIONS SHOULD BE THE MOST RECENT EDITION AND KEPT UP TO DATE AS PER THE LATEST NtM.



#### UPDATE OF NAUTICAL CHARTS AND PUBLICATIONS

ALL NAUTICAL CHARTS AND PUBLICATIONS SHOULD BE THE MOST RECENT EDITION AND KEPT UP TO DATE AS PER THE LATEST NtM. These can be received either in hardcopy or via

email with the latter being preferred, ensuring that corrections are promptly received and electronic files are quickly updated. Corrections should be carried out as soon as possible after being received. Time restrictions might prevent all corrections being completed before departure and in such cases the corrections for the forthcoming voyage should be prioritised. Charts and publications yet to be updated should not be utilised and be clearly separated from those in use.

If the vessel is also equipped with a second ECDIS as a means of back up, then it is good practice not to update both units simultaneously and instead allow time for the first ECDIS to resume normal operation before proceeding with updates to the second unit. This is to minimise the risk of any malware being introduced to both units should the update file have been infected. Furthermore, the ECDIS software also needs to be updated in order to display the latest charts correctly. This should be done in accordance with the latest IHO standard which can be found on **www.iho.int**. Failure to ensure the software is updated may result in the system being regarded as non-complaint with the requirements of SOLAS V/19.2.1.4.

Paper charts should be updated in accordance with the latest edition of NP294, 'How to keep your Admiralty Products Up-to-Date'. A log should be maintained for all updates/corrections to both ECDIS, paper charts and publications.

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Temporary/Preliminary Notice to Mariners should be temporarily marked on the chart.

#### TEMPORARY AND PRELIMINARY CHART CORRECTIONS (T/Ps)

A ROBUST SYSTEM SHOULD BE IN PLACE ENSURING THAT ALL TEMPORARY AND PRELIMINARY (T/P) NtMs, NAVIGATIONAL WARNINGS/NAVTEX, LOCAL NOTICES AND ANY OTHER INFORMATION THAT MAY AFFECT SAFE NAVIGATION ARE CONSULTED AND HIGHLIGHTED AS PART OF THE PASSAGE PLANNING. Most ECDIS types are capable of displaying T/Ps and Navigational Warnings and some even transfer these automatically on to the display. This often provides a good overview as all information is held in one place.

Some hydrographic offices do not publish T/P information for their ENCs. Therefore, navigators should be familiar with the approach of the hydrographic office publishing their ENCs. If T/P NtMs are not produced for ENCs, then the T/Ps will need

to be manually inputted into the ECDIS using the paper NtM. Details of which hydrographic offices produce T/Ps for their ENCs is available from the Status of T/P information provided for ENCs and/or paper charts by Hydrographic Office. Some commercial third parties provide, for a cost, overlay information for ENCs which contains T/P information.

With paper charts T/P NtMs should be temporarily marked on the chart in pencil and either be filed in a folder or attached to the chart for easy reference. Good housekeeping is essential to ensure that no important information is overlooked.

Any cancelled T/Ps, Navigational Warnings or other obsolete notices should be promptly removed.

Sometimes local notices might contradict the chart information. This is often seen with dredging operations where updates are yet to be issued. In cases where a local notice states a more favourable condition than the chart, for example increased depth, a vessel should carry out due diligence to verify this information. If it cannot be verified through T/Ps received, Navigational Warnings or any other reliable sources, then a worst case scenario should be adhered to allowing a safety margin for the vessel. ECDIS ALARMS SHOULD ALSO BE SET TO ALERT THE NAVIGATOR IF THE VESSEL IS APPROACHING A DANGER OR NO-GO AREA, OR ANOTHER RISK.

#### DANGERS TO NAVIGATION

ALL AREAS WHERE THE VESSEL CANNOT NAVIGATE SAFELY SHOULD BE CLEARLY MARKED E.G., SHALLOW WATER, UNDERWATER OBSTRUCTIONS OR NOTICE RECEIVED OF UNRELIABLE DEPTHS. When operating with ECDIS, the bridge team should be familiar with the CATZOC (Category Zone of Confidence) and how this is correctly applied to determine the reliability of the stated water depth along with its positional accuracy.

On ECDIS alarms should also be set to alert the navigator if the vessel is approaching a danger or no-go area, or another risk, or deviating more than a set distance from the planned track (cross track error). While alarms can act as a valuable tool to assist the officer of the watch (OOW) and increase situational awareness, it should always be thoroughly assessed which alarms are to be used and consideration given to their activation settings for each leg of the voyage, as too many might result in alarm fatigue with the risk of the OOW ignoring the important ones. Cross track distances should be considered and implemented for each leg of the voyage.

ECDIS depth settings (safety contour, shallow contour, deep contour and safety depth) should be carefully set for each leg of the voyage at the planning stage, in line with SMS requirements, so that depth alarms are activated appropriately considering the vessel's draught. Incorrectly or inappropriately set depths can have a fundamental effect on the screen display and could lead to confusion. There have been incidents where the ECDIS depth settings have altered the screen display so that potential dangers were not obvious, or alarms were not activated, and vessels have subsequently grounded.

Consideration should be given as to how to maintain safe navigation both when in the vicinity of danger areas and throughout the voyage. This includes but is not limited to:

- When increased position plotting intervals are to be applied, with maximum intervals stipulated.
- Means to verify the vessel's position e.g., using terrestrial, dead reckoning or celestial bodies. Electronic positions should be regularly corroborated by other means.
- Indicating wheel over points and rate of turn when approaching waypoints.
- Indicating the use of Parallel Indexing where suitable.
- Minimum Under Keel Clearance (UKC) required for each stage of the voyage, e.g., deep sea, coastal and when entering or leaving port, in accordance with the SMS. Where the required UKC cannot be achieved, the onboard SMS should provide the master with detailed guidance on the precautions to be taken.
- Safe speed for each stage of the voyage. Considering the proximity of navigational hazards to the planned track, the draught in relation to the depth of water, the anticipated traffic density and the manoeuvring characteristics of the vessel.
- Use of the echo sounder, including any recording mechanism where fitted.
- Safe abort points.



## APPROVAL AND FAMILIARISATION WITH THE PASSAGE PLAN

#### WHEN THE PASSAGE PLAN HAS BEEN PREPARED, THE MASTER SHOULD REVIEW ALL CHARTS AND INFORMATION

GATHERED BEFORE APPROVAL. On ECDIS an automatic route verification feature may be available. However, this should be used with caution and a careful manual check of the route at the most suitable scale is recommended. When approved by the master, no further changes should be made to the plan without his prior consent. Any changes should be consistent with the IMO's guidelines and should be clearly marked and recorded.

Subsequently all deck officers should also fully familiarise themselves with the passage plan. This includes awareness of any T/Ps, navigational warnings or local notices issued for the planned voyage or other navigational dangers.

#### **EXECUTING AND MONITORING**

THE VOYAGE SHOULD BE EXECUTED IN ACCORDANCE WITH THE PASSAGE PLAN AND THE PROGRESS OF THE VESSEL SHOULD BE CLOSELY AND CONTINUOUSLY MONITORED AGAINST THE PLAN. The information within the plan should be assessed throughout the voyage in order to identify any necessary changes as the voyage progresses. As per the IMO's guidelines, factors which should be taken into account when executing the plan, or deciding on any deviation from it include:

• Reliability and condition of the vessel's navigational equipment.

• Estimated times of arrival at critical points for tidal heights and flows.

• Meteorological conditions, particularly in areas known to be affected by frequent periods of restricted visibility, as well as weather routeing information.

• Day time versus night time passing of danger points and any effect this may have on the accuracy of position fixing.

• Traffic conditions, especially at navigational focal points.

Throughout the voyage the master should continuously assess whether the prevailing circumstances may require the utilisation of additional deck personnel on the bridge and/or having the engine on standby for manoeuvring. SITUATIONAL AWARENESS TRAINING LIKE BRIDGE RESOURCE MANAGEMENT (BRM) IS RECOMMENDED.

#### TRAINING AND AUDITING

BESIDES THE MANDATORY GENERAL AND TYPE SPECIFIC ECDIS TRAINING, AS WELL AS ANY MEMBER PROVIDED TRAINING ON THE PREPARATION OF A PASSAGE PLAN, SITUATIONAL AWARENESS TRAINING LIKE BRIDGE RESOURCE MANAGEMENT (BRM) IS RECOMMENDED. This enables the bridge team to develop best practices including effective and timely utilisation of all resources within their bridge operations, while also encouraging interaction and thereby creating a bridge environment where each team member feels comfortable in reporting any observations or concerns to the master or officer with the conn, without delay so that they can be evaluated and prompt action taken without risk of censure.

Passage planning, preparing and maintenance of nautical charts and publications should be a fixed part of a Member's internal audit checklist. Navigational assessments carried out either by the master or by an auditor are recommended at least annually and preferably during a passage. The navigational assessment has the benefit of both determining whether the passage plan complies with Member's SMS procedures and, very importantly, its practical execution by the bridge team. Where possible, this should include consideration of behavioural-based safety aspects of the bridge team's performance, including their internal interaction with the pilot, if on board, with constructive feedback subsequently provided to the master and bridge team by the auditor. This can also be performed remotely by analysing Voyage Data Recorder (VDR) data. A further useful learning approach can be to share the anonymised findings of such audits, including both negative and positive observations, on a fleetwide basis as part of instilling a learning culture.

#### **FURTHER INFORMATION**

FOR ADDITIONAL GUIDANCE PLEASE ALSO SEE 'BRIDGE TEAM MANAGEMENT' PUBLISHED BY THE NAUTICAL INSTITUTE AND THE 'BRIDGE PROCEDURES GUIDE' PUBLISHED BY INTERNATIONAL CHAMBER OF SHIPPING. BOTH PUBLICATIONS CONTAIN VALUABLE ADVICE AND EXAMPLES OF BEST PRACTICES IN PREPARING A PASSAGE PLAN.

If you have any questions or would like further advice on safe passage planning, then please contact the Britannia Loss Prevention team at **LossPrevention@tindallriley.com** 

### THE CLUB'S LOSS PREVENTION DEPARTMENT IS ALWAYS AVAILABLE TO SUPPORT MEMBERS AND RESPOND TO THEIR QUESTIONS.



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#### MANAGERS: TINDALL RILEY EUROPE SÀRL

Registered Office: 42 – 44 avenue de la Gare, L-1610 Luxembourg.

AGENTS FOR THE MANAGERS: **TINDALL RILEY (BRITANNIA) LIMITED** Regis House, 45 King William Street, London EC4R 9AN. T: +44 (0) 20 7407 3588 | F: +44 (0) 20 7403 3942

#### THE BRITANNIA STEAM SHIP INSURANCE ASSOCIATION EUROPE UK BRANCH

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