



Recommendations for safer e-navigation

Lessons learned from the grounding of the Nova Cura

How can we increase awareness of risks and limitations related to the use of Ecdis and how can we support the bridge team in voyage planning and safe navigation? Lessons learned from an accident analysis executed by the Dutch Safety Board (OVV) are translated to practical recommendations applicable on board

Practical tips:

- Check the chart reliability and mark where it is a threat for safe navigation.
- Always check the pick report for relevant places.
- Be alert at chart boundaries.
- Define procedures for the use of specific info layers.
- Mark sector lights and the moment when to switch on this layer.
- When rerouting execute new voyage preparation and share it with crew.

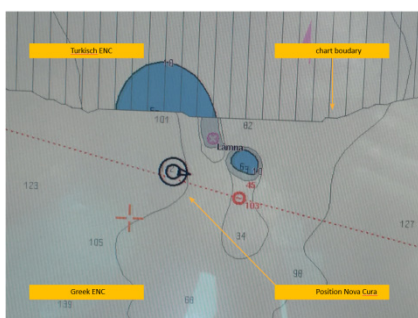
Grounding Nova Cura on Lamnas Reef

On April 20 2016 the Dutch Nova Cura grounded at Lamnas Reef in Mytilini street near Lesbos. The vessel was used to sail in the Mediterranean. At the moment of the accident the crew was one person more than minimum safe manning level and the captain had 26 years of experience. The vessel was certified for paperless sailing and the officers were trained in the use of Ecdis.

Accident investigation by the Dutch safety board demonstrated that the use of old paper chart skills is still needed when navigating with digital aids. The use of Ecdis is not as intuitive as using paper charts. It requires a more active attitude in collecting relevant information. The presentation of digital information differs from paper chart presentations. Misinterpretation of information can lead to wrong assumptions, especially when chart information is not cross checked with the pilot information. The Ecdis has many options of switching on/off layers of information and the accuracy of the map varies per location which is not always immediately clear. Commercial pressure can lead to rerouting without new voyage preparation.

Accident analysis identifies the following points of attention:

- In Ecdis digitized paper charts could be outdated. Check chart reliability.
- Cross check information from pick reports, pilots and chart (boundaries).
- Zooming in does not increase accuracy and quality of information.
- The representation of sector lights in Ecdis is not the same as on paper charts.
- Too much information can hide the mean message and is not always safer.
- Too little information may suggest a safe situation.
- Balancing the amount of information in Ecdis requires selection and definition of just in time user information.
- Importance of doing and sharing new voyage preparation after rerouting.



ENC with location of accident



Greek paper chart with location



Chart BA1061 with location + sailing directions



Sailing directions in ENC

Possible services:

- Training safer e-navigation
- Ship handling course
- BRM team training
- Safety awareness workshop
- Bowtie analysis
- Observations and advisory on board or in simulator

Expertise and experience

MARIN can assist you with developing and implementing these recommendations in your daily operation. We have experience with many vessel types and operations and we combine our expertises in nautical, human factor, safety and training.

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Background info

Each country is responsible for developing electronic charts of their own seas. Information at the overlays between charts is not always consistent. That makes the overlay between charts of different countries a potential risk which is not always recognised by the crew. In this case, the reef at which the Nova Cura grounded was visible on two different charts which were not corresponding to each other. The used chart is a digitized old paper chart. The accuracy of data presented on charts is expressed with the CATZOC label. In this case the chart was qualified as 'unknown'. Updates based on satellite pictures exist (in the pick reports) but the availability depends on the Reseller of ENC's.

The Lamnas reef is marked with sector lights and pilots include information on safe passing the reef. On paper charts the drawn sailing directions cover the whole region of the reef. This is not the case in the ENC, where short lines only locate the position of the sector lights, and not the area that is covered by the lights. See the differences in the pictures on the left. A misinterpretation of digital information when using paper chart skills is possible.

The Ecdis covers so much information that in practice many layers are switched off. Too much information can hide the mean message and too little information may suggest a safe situation. An active selection of the required information at the right moment is needed.

During the voyage, the destination can change. Commercial pressure can lead to the selection of the shortest route without doing a new voyage preparation. Taking the time to read the pilots and cross-check this information with the information from the chart can result in safer other routes.

Variations in your operation

An accident is often caused by a combination of deviations from a predefined plan. In this case, the unlucky combination of rerouting, commercial pressure, unreliable charts, misinterpretations, assumptions and no new voyage preparation led to the accident. Process safety aims to minimizing risks in your operation by reducing the amount of variations in your planned process. A rule of thumb is to stop when three variations are present. The challenge is to be aware of these deviations.

Practical implementation

- Define a procedure for voyage preparation including relevant items such as CATZOC, pick reports and sailing directions.
- Develop a procedure to define when and under which circumstances you need to activate specific layers in Ecdis, like pick report or sector light.
- Do not assume good quality of the charts and cross check your interpretation of information with for example pilots or other aids.
- Always execute a new voyage preparation when rerouting.
- Know how to identify deviations from the original plan. Increase awareness of the risk of variations and stop when three or more variations are shown.