

SUMMARY IN ENGLISH

An accident occurred during Amphibious Regiment training in leading sector light navigation in the Sandhamn fairway in the Stockholm archipelago when a G-boat travelling at high speed collided with a light buoy. The exercise was the second in navigating in darkness for the students. The weather was clear and good visibility, with a water temperature of approx. +12°C.

After the collision with the light buoy, the crew on board the G-boat regarded it to have sunk and all four crew members ended up in the water. They were then able to come ashore on an island and then be rescued.

The navigation method used was the GKSF-method for high-speed boats and an additional method using supplementary position finding, which usually occurs with help from the lighthouse sectors, through the use of Night Vision Goggles (NVG). This method for navigating in the dark has not been described in any of the Swedish Armed Forces' governing nautical publications.

SHK has during the investigation found several weaknesses regarding the planning and execution of the exercise.

SHK has found that the direct cause of the accident was that insufficient supervision was maintained in the boat's direction of travel with regard to the boat's speed.

An underlying cause was that the training was conducted as a combination of navigation in a lighthouse-illuminated fairway and a daylight navigation method for high-speed boats using optical leading marks supported by image enhancers. The navigation methods were partly in conflict with each other, and the use of image enhancers tangibly disrupted the visual lookout and the possibility to discover the buoy that was collided with.

Factors contributing to the accident were the short amount of time that could be allocated for the voyage's route planning, the length of the working hours and the time of day, alongside the students' limited experience of navigation in a lighthouse-illuminated fairway.

Safety recommendations

The Swedish Armed Forces are recommended to:

- Take measures aiming to ensure that the Swedish Armed Forces' instructions for navigation methods and sea safety analysis in BryggI M and FMMS are followed in operations of the Amphibious Regiment. *(RM 2016:01 R1)*
- Take measures aiming to ensure that the Swedish Armed Forces' BOA and CSSB are followed in operations of the Amphibious Regiment. *(RM 2016:01 R2)*
- Take measures to ensure that equipment is not used without the risks of integration having been analysed in accordance with the Swedish Armed Force's handbook for system security. *(RM 2016:01 R3)*

- Ensure that the planning of working hours provides good conditions for being able to conduct basic training without the risk of tiredness. *(RM 2016:01 R4)*
- Review whether, and if so under which conditions, image enhancers are to be used when navigating at sea. *(RM 2016:01 R5)*
- Examine and consider whether the water temperature limit for the requirement to wear a survival suit should be raised. *(RM 2016:01 R6)*
- Ensure that personnel are well versed in the function and use of life jackets. *(RM 2016:01 R7)*