



## Safety recommendation no. 180

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<b>Safety deficit</b>	<p>At 21:13 on 7 December 2017 the MS Diamant, which was operating a special service, collided with a rock near the shore, 400m from the Kehrsiten-Bürgenstock landing stage. The hull was damaged laterally over a length of 23 m, causing water to enter three watertight compartments via a crack about 1.2 m long. The MS Diamant was subsequently able to reach the landing stage under its own power, with all passengers disembarking unharmed. The immediate and proportionate response by the crew (issuing an alert without delay and piloting towards the landing stage) and the appropriate measures taken by participating emergency services (pumping water from the ship, provisional sealing of leak by diving specialists) helped minimise the damage.</p> <p>The reason the MS Diamant ran aground on 7 December 2017 on its special service near the Kehrsiten-Bürgenstock landing stage was because it manoeuvred into an unsafe position while approaching the landing stage at night and was consequently steered too close to the shore. Both shipmasters were too slow to notice the spatial disorientation created by the lack of visible reference points in the dark shore area, the bright lighting on the MS Waldstätter ahead and the illumination on the landing stage. The available aids (radar and GPS with heading lines and speed indicators) were insufficiently used, and the handover of command was unstructured. The requirements for approaching the landing stage – including keeping to the shipping lane and regulating speed – were not followed. The incident shows that the error tolerance of the man-machine-environment system was insufficient under such circumstances.</p> <p>The following contributed to the accident:</p> <ul style="list-style-type: none"><li>• The shipmasters' desire to meet their obligation to moor the ship on time.</li><li>• The shipmasters' insufficient awareness of the fact that, despite good visibility, they were vulnerable to optical illusions and spatial disorientation while piloting at night and should have consistently deployed the available aids. This issue was not sufficiently addressed in training on risk recognition and response.</li></ul> <p>The following weaknesses were identified during the investigation:</p> <ul style="list-style-type: none"><li>• Insufficient operational guidance and standard operating procedures (SOP) for piloting with radar at night and for handing over command.</li><li>• The shipmasters' insufficient training and consequent lack of awareness regarding human performance limitations, which resulted in a failure to develop appropriate human factors competences for piloting at night.</li></ul> <p>The SGV course on shipmaster training describes the piloting procedures for approaching, departing and reversing. Other standard operating procedures are not described.</p>

State requirements for operating regulations of shipping companies do not offer greater precision either qualitatively or in their content. The SGV operating regulations do not include a list of safety-relevant processes – such as piloting at night, handover of command, or the failure of a control system – which could be defined and trained using standard operating procedures.

Defining standard operating procedures helps to improve error resilience in the man-machine-environment system. Such standard operating procedures can apply to a range of conditions/situations/phases and each contains specific examples based on the principle of 'best-use-of-equipment'. It is quite possible for standard operating procedures to consist of criteria and rules that enable straightforward decision-making in a specific situation.

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**Safety recommendation**

The Federal Office of Transport (FOT) should provide shipping companies with guidelines for their operating regulations. These should improve error resilience in the man-machine-environment system by ensuring the companies set down in writing, assess, develop, and provide training in standard operating procedures for a range of situations, based on a risk assessment.

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**Addressees**

Bundesamt für Verkehr

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**Stage of the implementation**

Partially implemented. The existence of operating regulations for ships is required by Article 14 of the Shipbuilding Ordinance (ShipBO). A detailed list of the required content of such operating regulations has not yet been created by the legislator and has been left to the respective shipping companies. Shipping companies vary greatly in size and organisation and must have leeway to adopt logical and implementable operating regulations. Given the current complexity of marine systems and nautical facilities and the shipmasters' responsibilities, it will be necessary to issue uniform basic guidelines for operating regulations in the future. The FOT integrated corresponding content specifications for operating regulations in the 2023 revision of the ShipBO/IP-ShipBO (Art. 14), for example on 'Night journeys' and on 'Transfer of control of the ship's command'. The revised ShipBO/IP-ShipBO is expected to enter into force on 1 January 2024. Detailed operating regulations must continue to be written by the shipping companies themselves and must be logical and implementable for the company.

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**Investigation report concerning the safety recommendation**

Vorbericht  
Schlussbericht