

## Domestic commercial vessel (DCV) steering systems

### The incident

On 12 May 2021, a passenger ferry experienced a steering system component failure resulting in an uncommanded steering input and temporary loss of directional control.

A return spring broke in the helm steering mechanism and when the helm's wheel was released, it rotated towards port and engaged the rudder. The vessel was travelling at 14 knots at the time of the incident. The master unsuccessfully attempted to use alternative steering controls to correct the uncommanded turn. The master then slowed the vessel before disengaging the primary steering pumps and engaging the pneumatic backup steering system. The rudder remained to port for 199 seconds before backup systems were engaged. During this time the vessel deviated from the intended course and turned to port by approximately 90 degrees across a channel.

The class of vessel involved in the incident had experienced similar return spring failures in recent times although the causes of such failures along with the appropriate responses to them were not known to all operational personnel.

### Operator follow up

The Chief Investigator requested further information from the operator including their internal investigation reports, risk assessments, risk registers, training and maintenance records and vessel data. Following a review of this information and other recent similar incidents, OTSI wishes to highlight several areas where safety management processes could be improved.

### Key points for operators

In 2021, a total of eight incidents relating to problems with DCV vessel steering systems have been reported to OTSI with varying failure modes. These include mechanical and electrical component failures, corrosion within primary control switches and maintenance induced faults.

The steering system is critical for safe navigation and ought to be designed and maintained to ensure its continued safe operation throughout the vessel's lifecycle. Operators' safety management systems (SMS) are the primary means to ensure risks are assessed and controls are implemented for managing steering system failures. Marine Order 504 sets out relevant SMS requirements and can assist in SMS design.

Training and emergency response procedures are also essential. They must be developed, implemented and reviewed at appropriate intervals to ensure failure modes are understood and appropriate responses are applied. As limitations in design or understanding can result in delays or unintended consequences when responding to emergencies.

### Safety message

DCV operators should ensure that failure modes associated with critical steering systems (including backup systems) are assessed and appropriate risk controls are implemented. Maintenance regimes should also effectively monitor asset condition and regular refresher training should be provided to operational personnel so they are able to successfully respond to failures should they occur.