

# E25 Failure detection and response of all types of steering gear control systems

(June 2016)

(Rev.1

Dec 2019)

(Rev.2

Mar 2022)

## 1. Application

1.1 This UR applies to Steering Gear Control System as defined in UR M42 Appendix 1 Item 1.

## 42. Failure detection

42.1 The most probable failures that may cause reduced or erroneous system performance shall be automatically detected and at least the following failure scenarios shall be considered:

- (a) Power supply failure
- (b) Earth fault on AC and DC circuits
- (c) Loop failures in closed loop systems, both command and feedback loops (normally short circuit, broken connections and earth faults)
- (d) Data communication errors
- (e) Programmable system failures (Hardware and software failures)
- (f) ~~Hydraulic locking~~
- (g) Deviation between rudder order and feedback\*

\* Deviation alarm shall be initiated if the rudder's actual position does not reach the set point within acceptable time limits for the closed loop control systems (e.g. follow-up control and autopilot). Deviation alarm may be caused by mechanical, hydraulic or electrical failures.

42.2 All failures detected shall initiate audible and individual visual alarm on the navigation bridge.

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Note:

1. This UR is to be uniformly implemented by IACS Societies on ships contracted for construction (as defined in IACS PR29) on or after 1 July 2017.
2. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
3. ~~Rev. 1~~ Rev.1 of this UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2021.
4. Rev.2 of this UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2023.

**E25**  
(cont)**23. System response upon failure**

23.1 The failures (as defined but not limited to those in 4.2.1) likely to cause uncontrolled movements of rudder are to be clearly identified. In the event of detection of such failure, the rudder is to stop in the current position without manual intervention or, subject to the discretion of the Classification Society, is to return to the midship/neutral position. For mechanical failures such as sticking valves and failure of static components (pipes, cylinders), the system response without manual intervention is not mandatory, and the operator can follow instructions on the signboard in case of such failures, in accordance with UR M42.13.

Note: For hydraulic locking failure, refer also to UR M42.12.2 and 42.13.

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