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Surf-riding Operational Measures for Fast Semidisplacement Naval Hull Form

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Surf-riding/broaching failure mode is one of the Second Generation Intact Stability Criteria (SGISC) dealt by IMO. The SGISC are structured with a multi-tiered approach: Level 1, Level 2 and Direct Stability Assessment (DSA). When a ship does not verify one level, the next one must be applied, or the ship design must be modified. If ship changes are not feasible, Operational Measures (OM) can be provided to avoid dangerous situations and reduce the likelihood of stability failures. The OM are divided into Operational Limitations (OL) related to areas or routes and related to maximum significant wave heights and Operational Guidance (OG).

The surf-riding criterion has been applied on the parent hull of the Systematic Series D, a fast semi-displacement naval hull with forms typically vulnerable to surf-riding phenomenon. The 90 m length ship results vulnerable to Level 1 and 2, therefore Operational Measures have been discussed and provided for a hypothetical route in the Mediterranean Sea (Area 26).

Following the OL, in considered Area 26 the ship operations are limited when significant wave heights exceed 3.8 m. The simplified OG define critical ship speeds to be avoided for each considered sea state.

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