

Establishment of Guidance for fatigue strength assessment including springing

■ Summary of Major Establishment

Related Rules/Guidance	Effective date
Guidance for fatigue strength assessment including springing	- ships contracted for construction on or after 1 July 2020

■ Major Establishment

○ Reason for Establishment

1. To evaluate the effect on the fatigue strength of hull girder vibration induced by hull resonance with wave loads and by whipping

○ Establishment

1. Established by supplementing the 'Guidelines for fatigue strength assessment including springing' established in 2018.
2. In order to calculate the stress used to calculate the fatigue damage, a modal superposition method that superimposes the eigenmodes of the hull and a load conversion method that calculates stress from the hull girder load acting on the ship's cross section are established.
3. Established a direct method that directly evaluates fatigue damage in consideration of springing and a comparative method that is calculated by comparing it with the fatigue strength evaluation results in Pt 3, Annex 3-3.
4. Established a procedure for evaluating linear springing in the frequency domain and a procedure for evaluating nonlinear springing with the effect of whipping in the time domain.
5. Established a procedure for evaluating nonlinear springing, including the effect of whipping in head seas conditions, for low-speed blunt ships where vertical bending moment is significant, such as ore carriers.

○ Impact Analysis

- ✓ Safety can be improved in terms of fatigue strength by evaluating the effect of the ship's vibration response by wave loading on fatigue damage.
- ✓ Scantlings increase may be required due to additional fatigue strength assessment.