

# **Brittle Fracture Tests in the Approval of the Manufacturing Process of Rolled Steels for Hulls**

## **Amended Guidance**

Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use

## **Reason for Amendment**

The Society requests that NRL drop weight tests be conducted as the brittle fracture test required as part of the approval of the manufacturing process of high tensile steel for hulls. When checking the approval test results of the manufacturing process of high tensile steel for hulls, the test results of NRL drop weight tests were identified as all clear if the strain aging Charpy impact test was satisfied. Therefore, in the future, it is believed that NRL drop weight test may be applied to only high grades of steel such as grade E/EH and more in line with IACS Unified Requirement (UR) W11.

CTOD tests and large-scale brittle fracture tests are requested for high grades of steel such as grade E/EH and more, but rolled steels not more than 50mm thick used for hulls have a sufficient record of practical use without any trouble regarding toughness. Therefore, it is believed that only the strain aging Charpy impact test needs to be applied in cases where thickness is not more than 50 mm just as is required by other Classification Societies.

On the other hand, with respect to extremely thick steel plates and newly-developed advanced materials, it is believed that a CTOD tests of welded joints needs to be conducted in addition to the strain aging Charpy impact test in cases where deemed necessary by the Society because it is necessary to pay attention to toughness of welded joints in addition to the toughness of base materials.

Accordingly, the requirements regarding the scope of application of brittle fracture tests have been amended.

## **Outline of Amendment**

- (1) With respect to rolled steels for hulls, requirements regarding the scope of application of NRL drop weight tests have been harmonized with IACS UR W11 (Rev.7).
- (2) The requirement that CTOD tests and large scale brittle fractures test are, in principle, to be conducted in cases where thickness is more than 50 mm has been specified.
- (3) CTOD tests of welded joints have been added to additional test items requested by the Society.