

Non-destructive Testing for Welded Joints of Extremely Thick Steel Plates of Container Carriers

Amended Guidance

Guidance for the Survey and Construction of Steel Ships Parts C, and K

Reason for Amendment

IACS Unified Requirement (UR) S33(Rev.3) (published in December 2020) stipulates classification requirements regarding measures for preventing the brittle crack initiation and propagation in cases where extremely thick steel plates are used for the longitudinal structural members of container carriers.

These requirements stipulate that advanced non-destructive testing (ANDT) may be carried out instead of the more common ultrasonic testing with respect to the block-to block butt joints of longitudinal structural members as one of the above-mentioned measures. The requirements of UR S33(Rev.3) have already been incorporated into the NK Rules.

Although UR S33(Rev.3) stipulates the time-of-flight diffraction (TOFD) technique as one example of ANDT that may be adopted, Annex 3 of the Technical Background (TB) for UR S33(Rev.3), which was published a few months later in February 2021, gives phased array ultrasonic testing (PAUT) as another example of ANDT that may be adopted.

Accordingly, in cases where extremely thick steel plates are used for longitudinal structural members of container carriers, relevant requirements were amended so that not only TOFD but also PAUT may be applied as ANDT for the block-to block butt joints of such based on the Annex 3 of the TB for UR S33 (Rev.3).

In addition, NK also released its “Guidelines for Non-destructive Inspection by Phased Array Ultrasonic Testing” in March 2020, and requirements for PAUT (including specific procedures) are specified in that guideline.

Outline of Amendment

Amended relevant requirement to specify that PAUT may be applied to the non-destructive testing of block-to block butt joints of longitudinal structural members of container carriers in cases where extremely thick steel plates are being used.

“Guidance for the survey and construction of steel ships” has been partly amended as follows:

Part C HULL CONSTRUCTION AND EQUIPMENT

C32 CONTAINER CARRIERS

C32.13 Special Requirements for Container Carriers Applying Extremely Thick Steel Plates

C32.13.3 Measures for Prevention of Brittle Fracture

Sub-paragraph -1 has been amended as follows.

1 “Other measures deemed by the Society to be equivalent in effectiveness to brittle crack arrest designs” in Note (1) of **Table C32.27, Part C of the Rules** means the non-destructive inspections, particularly those using the time-of-flight diffraction (*TOFD*) technique or the phased array ultrasonic testing (*PAUT*) specified in **M8.4.-2, Part M of the Guidance** are carried out at the locations specified in **8.4.3-8, Part M of the Rules**.

Part M WELDING

M8 NON-DESTRUCTIVE INSPECTION FOR THE WELDED JOINTS OF HULL CONSTRUCTIONS

M8.4 General Plan of Non-destructive Inspection

M8.4.3 Non-destructive Test Application Procedure

Sub-paragraph -2 has been amended as follows.

2 Where the non-destructive testing specified in **8.4.3-8, Part M of the Rules** is carried out, the *TOFD* technique or phased array ultrasonic testing (*PAUT*) may be carried out. In such cases, the shipbuilder or its subcontractor is to obtain the approval of the Society.