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REQUIREMENTS FOR THE MANOEUVRABILITY OF INLAND NAVIGATION VESSELS

Transmitted by the Government of the Russian Federation

Note: The secretariat reproduces below a revised version of the proposals of the Government of the Russian Federation concerning the draft recommendations on minimum navigability and manoeuvrability requirements for inland navigation vessels. The present document supersedes document TRANS/SC.3/WP.3/R.109.

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Manoeuvrability of vessels

1. After studying the comments from the Governments of Austria, Bulgaria and Slovakia (TRANS/SC.3/WP.3/1999/5) and the opinions of the experts of the CCNR working group (TRANS/SC.3/WP.3/1998/8) concerning the Russian draft recommendations on minimum navigability and manoeuvrability requirements for inland navigation vessels and comments thereon (TRANS/WP.3/R.109), and bearing in mind comments made on that document, the Russian Federation submits herewith draft recommendations taking into account the opinions of the parties participating in the elaboration of resolution No. 17.

2. It does so in the belief that the substantial differences between navigation conditions in waterway basins make the introduction of uniform requirements for the manoeuvrability of vessels/convoys unacceptable. Accordingly, the Russian Federation considers it advisable that, while there should be uniform manoeuvrability criteria for vessels/convoys in all waterway basins, it should be left to the local authorities to set the numerical values of individual minimum requirements in the light of navigation conditions in particular basins.

3. The Russian Federation considers that the minimum requirements whose numerical values local authorities should be given competence to set might include the following:

Maximum and minimum speeds of vessels/convoys;

Stopping distance of a vessel/convoy;

Permissible angle of drift when a vessel/convoy is under way in wind, and the wind speed to be used for calculating this.

4. The Russian Federation considers it inadvisable to use in the annex to resolution No. 17 the discrete methods for assessing vessels' manoeuvrability characteristics that are employed in CCNR Directives Nos. 1 and 2. The reason is that those methods are inadequately substantiated on points that include the following:

The method for simultaneous assessment of steadiness on course and turn-easing capacity, which are two fundamentally different physical processes;

The method for re-calculating the manoeuvrability characteristics of vessels/convoys on changing from non-standard to standard displacement;

The method for re-calculating a vessel's stopping distance on changing from navigation in running water to navigation in still water.

5. In view of the CCNR working group's objection to the methods we proposed in document TRANS/SC.3/WP.3/R.109, the Russian Federation considers it advisable, as has already been stated more than once, not to include the CCNR Directives in resolution No. 17 until a mutually satisfactory compromise has been reached on this issue, or to place the directives within the sole competence of the basin Administration.

DRAFT RECOMMENDATIONS ON MINIMUM NAVIGABILITY AND MANOEUVRABILITY REQUIREMENTS FOR INLAND NAVIGATION VESSELS

CHAPTER 1

INTRODUCTION

1.1 The navigability and manoeuvrability of vessels are determined by their technical characteristics (e.g. dimensions, shape of hull, engine installations, rudders, steering gear, degree of loading, trim).

1.2 Vessels must be capable of keeping course and of changing it under controlled conditions. They must also be able to carry out in a safe way some special manoeuvres like stopping and going astern without hindering the possibilities of the other traffic. In order to achieve a minimum safety level on inland waterways, all vessels and convoys should present a minimum navigability and manoeuvrability performance.

1.3 The local authorities shall determine what navigability and manoeuvrability performance is required and which dimensions of vessels and convoys are admissible on their waterways.

1.4 The navigability and manoeuvrability of vessels and convoys shall be verified by agreed tests of vessels.

CHAPTER 2

GENERAL PROVISIONS

2.1 PURPOSE AND SCOPE

The purpose of these Recommendations is to define the manoeuvrability characteristics of vessels/convoys to which requirements shall apply, as well as methods for their numerical assessment, and the minimum requirements for characteristics that are common to all waterways with regard to other characteristics, the minimum requirements for the manoeuvrability of vessels/convoys shall be established by the local authorities.

The results of the description of the manoeuvrability performance of the vessel should be presented in the form of a “Table of the vessel's manoeuvrability characteristics”, the presence of which on board the vessel should be a condition for allowing the vessel to navigate.

2.2 TERMS AND DEFINITIONS

The terms used in these Recommendations are fully in accordance with the definitions of terms contained in the European Code for Inland Waterways (CEVNI) adopted by the United Nations Economic Commission for Europe (TRANS/SC.3/115).

2.3 RELATION TO DOCUMENTS IN FORCE AND TO CEVNI

The provisions of these Recommendations are fully in accordance with CEVNI and with the Recommendations on Technical Requirements for Inland Navigation Vessels (annex to resolution No. 17 revised (TRANS/SC.3/104 and Adds. 1-3)). The terms are based on the provisions of the above-mentioned instruments and are intended to promote their uniform application.

CHAPTER 3

MINIMUM MANOEUVRABILITY REQUIREMENTS

This chapter describes in a number of tests the minimum manoeuvrability requirements for vessels and convoys.

In the case of convoys composed of e.g. several vessels or a pushboat with one or more barges the manoeuvrability requirements apply to the convoy as a whole.

The test area should meet the minimum requirements set out in chapter 4, and the test results should be corrected for test conditions.

3.1 STRAIGHT COURSE

The vessel/convoy must be able to keep a chosen straight course. The frequency with which the helm is put over in order to keep the vessel/convoy on course must not be more than five times a minute.

For empty cargo vessels/convoys, passenger vessels and all ships with a high-piled-up cargo, e.g. containers, calculations must be made of navigation under wind conditions in order to determine the vessel's/convoy's ability to maintain course. For navigation on a straight course with a side wind, the calculated angle of drift of vessels/convoys should not exceed a value set by the local authorities on the basis of the dimensions of waterways in the basin concerned and of those authorities' regulation wind speed.

3.2 SPEED WHILE GOING AHEAD

A vessel/convoy must be able to develop and maintain maximum and minimum speeds relative to the water the values of which are set by the local authorities on the basis of conditions in the basin concerned.

3.3 CHANGE OF COURSE

Vessels with the initial speed mentioned in paragraph 3.2 and the maximum rudder angle must be able to make a change of course of at least 10^{o} within a time of 30 s. During this change of course the vessel/convoy shall reach an angular speed of turn of at least 30^{o}/min. Then, in the next 60 s, the vessel/convoy should be able to return to its original course.

For convoys exceeding 110 m in length, the change of course during the first 30 s shall be at least 5^{o}, and the return to the original course must be achieved within the next 90 s.

The angle of overshoot of the vessel/convoy after the helm has been put over for easing shall not exceed 20° during these tests.

3.4 STOPPING

Vessels/convoys must be sufficiently powerful to stop from maximum speed within a minimum distance set by the local authorities for the basin concerned.

Stopping means stopping relative to the water. Stopping tests should be carried out in deep still water. If they are carried out in running water, the stopping distance measured relative to the bank shall be corrected to allow for the speed of the current.

During the stopping manoeuvre, the vessel/convoy shall remain sufficiently manoeuvrable and its course sufficiently steady.

3.5 TURNING

The turning capacity of a vessel/convoy shall be assessed by determining the diameter of the circle measured from the centre of gravity of the vessel/convoy that the vessel/convoy describes with the maximum rudder angle.

The diameter of the circle measured from the centre of gravity of the vessel/convoy shall not exceed:

For single vessels - 2 vessel lengths

For convoys - 3 vessel lengths.

The diameter of the circle may be determined:

By making the circle with the maximum rudder angle and at the maximum speed referred to in paragraph 3.2. If this manoeuvre is carried out in running water, the diameter of the circle shall be taken as the distance between the extreme points of the trajectory of the vessel's/convoy's centre of gravity measured perpendicularly to the current;

By causing the vessel/convoy to enter a turn under the same conditions with the maximum rudder angle and by easing the turn by reversing the rudder as soon as the vessel/convoy deviates from its original course by an angle equal to the rudder angle.

In this case, the diameter of the circle shall be approximately defined as:

$$D = 50 \frac{V_o}{r} (1)$$

Where V_o is the speed of the vessel/convoy on its original course, in m/s

r is the speed of the vessel/convoy at the moment of easing of the turn in degrees/s.

3.6 GOING ASTERN

A vessel/convoy must have adequate manoeuvrability while going astern, i.e. it must be capable of moving in the desired direction both when manoeuvring to stop and when prolonged movement astern is required for reasons of navigation.

When the stopping test is carried out in accordance with paragraph 3.4 above on still water, an additional going-astern manoeuvre is required in order to determine the vessel's/convoy's ability to maintain course while going astern.

CHAPTER 4

TEST AREA

The test area shall be situated on a straight section of adequate length and breadth. The speed of the current shall be as low as possible, not exceeding 1.5 m/s on the average. The water shall be as deep as possible. The desirable depth of the water for testing is three or more times the draught of the vessel.

CHAPTER 5

REQUIREMENTS FOR THE VESSEL OR CONVOY DURING THE TESTS

5.1 DEGREE OF LOADING

During manoeuvrability tests, cargo-carrying vessels and convoys shall be loaded to at least 70% of their deadweight and the cargo shall be distributed in such a way as to ensure a horizontal trim as far as possible.

If a vessel/convoy can only comply with the minimum requirements of these Recommendations when loaded less than the prescribed 70%, it must be explicitly noted in the test report at what maximum loading the minimum requirements are met.

Whenever it can be expected that specific loading conditions less than 70% will be decisive for the navigability and the manoeuvrability of the vessel/convoy, the tests, or the affected part of the tests, shall be carried out under those specific loading conditions.

CHAPTER 6

TEST REPORT

The results of each test and the circumstances during the test shall be reported for certification purposes as well as for research purposes in order to come to an evaluation of the minimum requirements given in these Recommendations. They shall also be available for use by the crew and recorded in the “Table of the vessel's manoeuvrability characteristics”.
