



RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER

No. 313-69-1353c

dated 13.03.2020

Re:

amendments to the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships, 2020, ND No. 2-020101-130-E

Item(s) of supervision:

internal combustion engines and their components, steam and gas turbines, gearings, diesel-generators, piston pumps and compressors, blowers, deck machinery, machinery bench tests, thrust, intermediate and propeller shafts, propulsors/propellers

Entry-into-force date:

~~Valid till:~~

~~Validity period extended till:~~

refer to Appendix 1

~~Cancels / amends / adds Circular Letter No.~~

~~dated~~

Number of pages: 1+11

Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to Part IV "Technical Supervision during Manufacture of Products"

Director General

Konstantin G. Palnikov

Text of CL:

We hereby inform that the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships have been amended considering experience in application of the Rules and IACS UR M80 (May 2019) and given in the Appendices to this Circular Letter.

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of the RS surveyors, interested organizations and persons in the area of the RS Branch Offices' activity.
2. Apply provisions of the Circular Letter during review and approval of the technical documentation on machinery intended for application on ships contracted for construction or conversion on or after the dates specified in Appendix 1, and in the absence of a contract – on ships the keels of which are laid, or which are at a similar stage of construction on the dates specified in Appendix 1 as well as when performing technical supervision during manufacture of machinery requested for survey on or after the dates specified in Appendix 1.

List of the amended and/or introduced paras/chapters/sections:

Part IV: paras 5.2.1, 5.2.2, 5.2.8 — 5.2.26, 5.3.1, 5.4.13, 5.6.21.13, 5.7.9.1.1, 5.9.1.7, 5.9.5.1, 5.9.5.9, 5.10.2.7, 5.10.3.7.2, 5.12.15, 5.12.18, 5.12.21, 5.14.4.1, 5.14.4.2.4, 5.14.5.2, 5.14.5.3, 5.14.6.2, 6.2.5, 6.2.16 and 7.1.22, Table of Appendix 2 to Section 5, Appendix 3 to Section 5, paras 3.5 and 8.6 of Appendix 6 to Section 5, paras 4.4.3, 4.4.6 and 4.5.1 of Appendix 7 to Section 5, para 2.1 of Appendix 10 to Section 5, para 2.1 of Appendix 11 to Section 5.

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**Information on amendments introduced by the Circular Letter
(for inclusion in the Revision History to the RS Publication)**

Nos.	Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
1	Para 5.2.1	The reference to the applicable requirements of the RS normative documents has been specified	313-69-1353c of 13.03.2020	01.05.2020
2	Chapter 5.2	Table 5.2.1 has been deleted, paras 5.2.2.3, 5.2.8, 5.2.11, 5.2.16, 5.2.19 — 5.2.22 and 5.2.24 have been deleted. Paras 5.2.9, 5.2.10, 5.2.13 — 5.2.15, 5.2.17, 5.2.18, 5.2.23, 5.2.25 and 5.2.26 have been renumbered 5.2.8 – 5.2.18, accordingly	313-69-1353c of 13.03.2020	01.05.2020
3	Para 5.2.2	The para has been renamed	313-69-1353c of 13.03.2020	01.05.2020
4	Para 5.2.2.1	The scope of the requirement application has been specified	313-69-1353c of 13.03.2020	01.05.2020
5	Para 5.2.10 (existing)	The scope of the piston check has been specified	313-69-1353c of 13.03.2020	01.05.2020
6	Para 5.2.15.1 (existing)	The scope of the crankshafts check has been specified	313-69-1353c of 13.03.2020	01.05.2020
7	Para 5.2.17(existing)	The para has been renamed and the reference to the requirements of Section 7 has been deleted	313-69-1353c of 13.03.2020	01.05.2020
8	Para 5.2.18 (existing)	The heading of the para has been specified	313-69-1353c of 13.03.2020	01.05.2020
9	Para 5.2.26.3 (existing)	The requirement for the inspections of the parts of internal combustion engines (ICE) components after testing has been specified	313-69-1353c of 13.03.2020	01.05.2020
10	Para 5.3.1	The reference to the applicable requirement has been specified	313-69-1353c of 13.03.2020	01.05.2020
11	Table 5.3.1	The table has been deleted	313-69-1353c of 13.03.2020	01.05.2020
12	Para 5.4.13	The reference to the applicable requirement has been specified	313-69-1353c of 13.03.2020	01.05.2020

Nos.	Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
13	Para 5.6.21.13	The requirements for necessary branding have been deleted	313-69-1353c of 13.03.2020	01.05.2020
14	Para 5.7.9.1.1	The reference to the applicable requirement has been specified	313-69-1353c of 13.03.2020	01.05.2020
15	Para 5.9.1.7	The requirement has been specified	313-69-1353c of 13.03.2020	01.05.2020
16	Para 5.9.5.1	The references have been specified	313-69-1353c of 13.03.2020	01.05.2020
17	Para 5.9.5.9	The requirements for recording parameters when testing air blowers have been specified	313-69-1353c of 13.03.2020	01.05.2020
18	Para 5.10.2.7	The reference to the applicable requirements has been specified	313-69-1353c of 13.03.2020	01.05.2020
19	Para 5.10.3.7.2	The requirements for issue of the Certificates for windlasses and anchor capstans have been specified	313-69-1353c of 13.03.2020	01.05.2020
20	Table 5.12.15	The blank lines has been deleted	313-69-1353c of 13.03.2020	01.05.2020
21	Para 5.12.18	The reference to the applicable requirements has been specified	313-69-1353c of 13.03.2020	01.05.2020
22	Para 5.12.21	The requirements for the information to be available on a diesel-generator's data plate considering IACS UR M80 (May 2019) have been introduced	313-69-1353c of 13.03.2020	01.07.2020
23	Para 5.14.4.1.	The reference to the Certificate form has been specified	313-69-1353c of 13.03.2020	01.05.2020
24	Para 5.14.4.2.4	The requirements for the submitted documentation on internal combustion engines have been specified	313-69-1353c of 13.03.2020	01.05.2020
25	Para 5.14.5.2.	The references to the applicable requirements have been specified	313-69-1353c of 13.03.2020	01.05.2020
26	Para 5.14.5.3.	The references to the applicable requirements have been specified	313-69-1353c of 13.03.2020	01.05.2020
27	Para 5.14.6.2.	The references to the applicable requirements have been specified	313-69-1353c of 13.03.2020	01.05.2020
28	Appendix 2 to Section 5, Table	The Table has been assigned with No. "1"	313-69-1353c of 13.03.2020	01.05.2020

Nos.	Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
29	Appendix 2 to Section 5, Table 1	Title of item № 24 has been specified. The text of footnote "10" has been specified	313-69-1353c of 13.03.2020	01.05.2020
30	Appendix 3 to Section 5	The Appendix heading has been specified and the form has been updated	313-69-1353c of 13.03.2020	01.05.2020
31	Appendix 6 to Section 5, para 3.5	The reference to the applicable requirements has been specified	313-69-1353c of 13.03.2020	01.05.2020
32	Appendix 6 to Section 5, para 8.6	The requirements for conditions of tests for 2-stroke propulsion engines have been specified	313-69-1353c of 13.03.2020	01.05.2020
33	Appendix 7 to Section 5, para 4.4.3	The requirements for the tests of internal combustion engines have been specified	313-69-1353c of 13.03.2020	01.05.2020
34	Appendix 7 to Section 5, para 4.4.6	The requirements for the tests of internal combustion engines have been specified	313-69-1353c of 13.03.2020	01.05.2020
35	Appendix 7 to Section 5, para 4.5.1.	The requirements for barred speed ranges. have been specified	313-69-1353c of 13.03.2020	01.05.2020
36	Appendix 10 to Section 5, para 2.1	The reference to the applicable IACS requirements has been updated	313-69-1353c of 13.03.2020	01.05.2020
37	Appendix 11 to Section 5, para 2.1	The reference to the applicable IACS requirements has been updated	313-69-1353c of 13.03.2020	01.05.2020
38	Table 6.2.5	The requirements for the radial run-out of the shafts have been specified	313-69-1353c of 13.03.2020	01.05.2020
39	Para 6.2.16	The requirements for necessary branding have been deleted	313-69-1353c of 13.03.2020	01.05.2020
40	Para 7.1.22	The requirements for necessary branding have been deleted	313-69-1353c of 13.03.2020	01.05.2020

RULES FOR TECHNICAL SUPERVISION DURING CONSTRUCTION OF SHIPS AND MANUFACTURE OF MATERIALS AND PRODUCTS FOR SHIPS (2020)

ND No. 2-020101-130-E

PART IV. TECHNICAL SUPERVISION DURING MANUFACTURE OF PRODUCTS

5 MACHINERY

1 **Para 5.2.1** is replaced by the following text:

"**5.2.1** Technical supervision during manufacture of the internal combustion engines, their assemblies and parts shall be performed in accordance with the provisions of Appendix 8, list of items and the RS Nomenclature."

2 **Table 5.2.1** is deleted. **Paras 5.2.2.3, 5.2.8, 5.2.11, 5.2.16, 5.2.19 — 5.2.22 и 5.2.24** are deleted. **Paras 5.2.9, 5.2.10, 5.2.13 — 5.2.15, 5.2.17, 5.2.18, 5.2.23, 5.2.25 and 5.2.26** are renumbered **5.2.8 — 5.2.18**, accordingly.

3 **Para 5.2.2** is renamed as follows:

"**5.2.2 Bed plates of internal combustion engines.**"

4 **Para 5.2.2.1** is replaced by the following text:

"**5.2.2.1** The bed plates of internal combustion engines welded and combined cast-and-welded construction, upon completion of preliminary treatment and all welding operations (including correction of defects by welding) shall be subjected to heat treatment in accordance with the approved procedure.

Minor defects the correction of which does not give rise to deformation of the bed plate (frame), on agreement with the surveyor, may be rectified without subsequent heat treatment."

5 **Para 5.2.10 (existing)** is replaced by the following text:

"**5.2.9 Pistons.**

During external examination of the finished pistons, the following shall be checked:
parallelism of the ring groove surfaces between each other;
perpendicular position of the ring groove to the piston axis;
perpendicular position of the axis of bore for the gudgeon pin to the piston axis and location of these axes in the same plane;
concentricity of the surfaces the centre of which is situated on the piston axis;
results of flaw detection."

6 **Para 5.2.15.1 (existing)** is replaced by the following text:

"**5.2.13.1** During external examination of a finished crankshaft, the following shall be checked:

parallelism of the generatrices of journals and crank pins to the crankshaft axis;
lack of cylindrical shape of the journals and crank pins;
crank throw setting angles, crank throw radii;
perpendicular position of the generatrices of journals and crank pins to the surfaces of webs;

run-out of journals and crank pins, flanges and seats for gear or sprocket to drive the camshaft;
observance of the radii and roughness rates of journal, crank pin and flange fillets as well as oil channels;
results of the flaw detection and heat treatment;
roughness of surfaces of the journals and crank pins."

7 **Para 5.2.17(exiting)** is replaced by the following text:

"5.2.14 Main, connecting rod, crosshead and built-in thrust bearings.

During external examination of the finished bearing shells for lining or the bearings completely manufactured of antifriction material or after lining, the following shall be checked:

concentricity of sections;
perpendicular position of the end faces to the bore axis;
concentricity of lining;
contact between the bearings and their seats;
interference fit (bushes-bearings);
results of inspection of the lining for flaw;
tight fit and interference value (thin-walled bearings)."

8 **Para 5.2.18 (existing)** is renamed as follows:

"5.2.15 Bolts and studs of connecting rods, main bearings, cylinder covers, attachment of counter-weights to crankshaft webs and connections of crankshaft sections, attachment of torsional vibration dampers."

9 **Para 5.2.26.3 (existing)** is replaced by the following text:

".3 upon completion of the bench tests, random inspection of the ICE components shall be performed within the scope stipulated by the bench test program."

10 **Para 5.3.1** is replaced by the following text:

"5.3.1 Technical supervision during the manufacture of the auxiliary ICE, their assemblies and components shall be performed in compliance with the applicable requirements of 5.2 and the requirements of 5.12."

11 **Table 5.3.1** is deleted.

12 **Para 5.4.13** is replaced by the following text:

"5.4.13 Bolts and studs for joining the split casings shall be checked in accordance with the requirements of 5.2.15."

13 **Para 5.6.21.13** is replaced by the following text:

".13 upon completion of building-up and painting, the turbine shall be presented to the surveyor for external examination. Where the results of the examination are satisfactory, the Surveyor shall issue the Register certificate."

14 **Para 5.7.9.1.1** is replaced by the following text:

".1 sliding bearings (refer to 5.2.14);".

15 **Para 5.9.1.7** is replaced by the following text:

"5.9.1.7 Mounting of piston-type pumps and compressors.

During mounting of the piston-type pumps and compressors, in order to verify whether the mounting has been properly made and complies with the requirements of the documentation, it is necessary to make sure that:

cylinders in case of direct-acting pump are aligned;

crankshaft is placed in mated bearings; and whilst so doing, the axes of the cylinders are perpendicular to those of the crank throws when in dead centres (DC) and are parallel to the guides (parallels);

pistons when moving down from top dead centre (TDC) to bottom dead centre (BDC) retain constant circular clearance along their edge;

bearings of the running gear have been matched and mounted with a required clearances;

crankshaft has been aligned with the driving shaft;

measurement results for the mounting made shall be submitted by the technical supervision body;

checks have been carried out by an approved method."

16 **Para 5.9.5.1** is replaced by the following text:

"5.9.5.1 Procedure for survey, approval, tests and component arrangement of the turbochargers with IC engines (refer to Appendix 9). For other machinery – refer to 5.9.5.2 — 5.9.5.9."

17 **Para 5.9.5.9** is replaced by the following text:

"5.9.5.9 When conducting the bench tests, the requirements for the recording parameters as set out in 5.9.5 and 5.12 shall be taken as guidance and whilst so doing, the consumed power and engine characteristics shall be recorded."

18 **Para 5.10.2.7** is replaced by the following text:

"5.10.2.7 When mounting the steering gear, in order to meet the requirements of the working documentation, it is necessary to make sure that:

hydraulic cylinders have been installed coaxially in pairs and their axis is parallel to the bearing surface of the slide and to the datum plane;

bearing surface of the slide is parallel to the bearing surface of the frame;

tiller axis is parallel, while the axis of bore for the rudder head is perpendicular to the datum plane;

mounting and tests of the hydraulic system comply with the technical documentation;

safety valves have been checked and adjusted;

input shaft of the reduction gear has been aligned with the prime mover;

required contact in the engagement of the output reduction gear shaft pinion with the tooth rim of the steering segment and their centre-to-centre distance have been provided;

for reduction gears, refer to 5.7;

results of the mounting measurements and checks have been submitted by the technical control body;

checks have been carried out by approved methods."

19 **Para 5.10.3.7.2** is replaced by the following text:

".2load test. The windlass shall be tested to verify that the continuous pull, overload capacity and heaving-in speed as specified in 6.3, Part IX "Machinery" of the Rules for the Classification and Construction of Sea-Going Ships can be attained.

Where the firm (manufacturer) does not have adequate facilities, these tests, including the adjustment of the overload protection, may be carried out on board ship. In these cases, functional testing at the firm (manufacturer) shall be performed under no-load conditions, and this information is specified in the Certificate/report;"

20 **Table 5.12.15.** The blank lines "90", "Starts" and "Reversals" are deleted.

21 **Para 5.12.18** is replaced by the following text:

"**5.12.18** The test scope given in this Chapter pertains to the tests of the machinery in case of a stable production.

The prototypes of the machinery shall be tested on the bench according to the program approved by the Register.

The scope and duration of the tests shall be assigned in each particular case, depending on the degree of the machinery refinement.

The scope and duration of the type tests of the ICE for issuance of Type Approval Certificate are considered in Appendix 6 to this Section."

22 **New Para 5.12.21** is introduced reading as follows:

"**5.12.21** The entity responsible of assembling the generating set shall install a rating plate marked with at least the following information:

.1 the generating set manufacturer's name or mark;

.2 the set serial number;

.3 the set date of manufacture (month/year);

.4 the rated power (both in kW and KVA) specifying its nature as defined in ISO 8528-1:2018: **COP** (continuous power), or **PRP** (prime power) or **LTP** (limited-time running power). **LTP** is acceptable to be specified only for emergency Generating sets;

.5 the rated power factor;

.6 the set rated frequency (Hz);

.7 the set rated voltage (V);

.8 the set rated current (A);

.9 the mass (kg)."

23 **Para 5.14.4.1** is replaced by the following text:

".1 Type Approval Certificate of ICE (CTO).

For each type of ICE that is required to be approved, a type approval certificate (Form 6.3.8-1) shall be obtained by the engine designer. The process details for obtaining a Type Approval Certificate are specified in 5.14.5.

This process consists of the engine designer obtaining:

approval of the ICE technical documentation;

conformity of production;

approval of type testing programmes;

type testing of ICE;

review of the obtained type testing results;

evaluation of the manufacturing arrangements;

issue of CTO upon satisfactory meeting the requirements of the Register Rules."

24 **Para 5.14.4.2.4** is replaced by the following text:

".4 submission format of documentation.

Documentation is submitted in electronic format taking into account the requirements for Sections 3 and 5, Part II "Technical Documentation".

25 **Para 5.14.5.2** is replaced by the following text:

"**5.14.5.2** Documents for approval or recalculation.

Tables 1.2.3.1-2 and 1.2.3.1-3, Part IX "Machinery" of the Rules for the Classification and Construction of Sea-Going Ships, list the documents and drawings which shall be approved by the Register."

26 **Para 5.14.5.3** is replaced by the following text:

"5.14.5.3 Design approval/appraisal.

Compliance of design approval and appraisal to the requirements of the Register rules (approval of technical documentation) are valid as long as no substantial modifications have been implemented (also refer to Sections 9 and 10, Part II "Technical Documentation" of the Rules). Where substantial modifications have been made the validity of the design approval may be renewed based on evidence that the design is in conformance with all current RS Rules and statutory regulations (e.g. SOLAS-74, MARPOL 73/78). (Also refer to 5.14.5.6)."

27 **Para 5.14.6.2** is replaced by the following text:

"5.14.6.2 Documents to be submitted for the ICE inspection and testing.

Table 1 of Appendix 2 lists the production documents, which shall be submitted by the ICE builder/licensee to the Register following acceptance by the ICE designer/licensor. The Register Surveyor uses the information for survey purposes during manufacture and testing of the ICE and its components (refer to 5.14.4.2.2.3 — 5.14.4.2.2.6)."

APPENDIX 2

PROCEDURE DOCUMENTATION FLOW

28 **Table** is assigned with No. "1".

29 Table 1. **Item No. 24** is replaced by the following text: "Oil mist detection and/or alternative alarm arrangements (refer to 2.3.4.8 — 2.3.4.22, Part IX "Machinery" of the Rules for the Classification and Construction of Sea-Going Ships)".

Table 1. Footnote "10" is replaced by the following text reading as follows:

"¹⁰ Documents modified by designer/licensor with ICE design for a specific application or performance shall be submitted to the Register for information or approval, as applicable (refer to 5.14.4.2.2.2)."

APPENDIX 3

INTERNAL COMBUSTION ENGINE TYPE APPROVAL APPLICATION FORM AND BASIC DATA SHEET (IN COMPLIANCE WITH IACS UR M44 (REV. 9 DEC 2015))

30 **Appendix 3** is renamed as follows:

"INTERNAL COMBUSTION ENGINE TYPE APPROVAL APPLICATION FORM AND BASIC DATA SHEET (IN COMPLIANCE WITH APPENDIX 3, IACS UR M44 (Rev.9, Corr.2))".

Appendix 3 (Page 7 below "Примечания/Notes") the text:

"Дата
Date"

is replaced by the following text:

"Должность
Job Title"

Дата
Date".

**TYPE TESTING APPROVAL OF INTERNAL COMBUSTION ENGINES (ICE)
AND RECOMMENDED CONTENT OF TYPE APPROVAL CERTIFICATE (CTO)**

31 **Para 3.5** is replaced by the following text:

"3.5 For electronically controlled diesel engines integration tests shall verify that the response of the complete mechanical, hydraulic and electronic system is as predicted maybe for intended operational modes approved at the works. If such tests are practically unfeasible at the works, however, these tests may be carried out during sea trials of the ship. The scope of these tests shall be agreed with the Register for selected cases based on the failure mode and effects analysis required in 1.2.3.1, Part IX "Machinery" of the Rules for the Classification and Construction of Sea-Going Ships."

32 **Para 8.6** is replaced by the following text:

"8.6 Operation with damaged turbocharger.

For 2-stroke propulsion engines intended for operation being part of a propulsion plant the achievable continuous power shall be determined in the case of turbocharger damage.

Engines intended for single propulsion with a fixed pitch propeller shall be able to run continuously at a speed (r.p.m.) of 40 % of full speed along the theoretical propeller curve when one turbocharger is out of operation. The test can be performed by either by-passing the turbocharger, fixing the turbocharger rotor shaft or removing the rotor."

**BENCH TESTS (FACTORY ACCEPTANCE TESTS (FAT)) AND ICE TESTS AFTER
INSTALLATION ONBOARD**

33 **Para 4.4.3** is replaced by the following text:

"4.4.3 Propulsion engines (main engines) driving fixed pitch propeller or impeller:

A) 100 % engine power (rated maximum continuous power (MCR)) at rated engine speed (n_r): at least 4 h;

B) 110 % power at engine speed $1,032n_r$, if engine adjustment permits (refer to 3.3.1): 30 min;

C) at approved intermittent overload (if applicable): testing for duration as agreed with the manufacturer;

D) minimum engine speed to be determined;

E) the ability of reversible engines to be operated in reverse direction shall be demonstrated.

Refer also to 4.5.1.

During stopping tests (refer to IMO resolution MSC.137 (76)), also refer to 4.5.1 for additional requirements in the case of a barred speed range."

34 **Para 4.4.6** is replaced by the following text:

"4.4.6 Propulsion engines (main engines) also driving power take off (PTO) generator:

A) 100 % engine power (MCR) at corresponding speed (n_r);

B) 100 % propeller branch power at rated engine speed (n_r) (unless already covered in A): 2 h.;

C) 100 % PTO branch power at rated engine speed (n_r): at least 1 h."

35 **Para 4.5.1** is replaced by the following text:

"4.5.1 Barred speed range.

Where a barred speed range (*bsr*) is required, passages through this *bsr*, both accelerating and decelerating, shall be demonstrated. Applies both for manual and automatic passing-through systems, taking into account the ship design. The ship's draft and speed during all these demonstrations shall be recorded. In the case of a controllable pitch propeller, the pitch shall also be recorded.

The times taken shall be recorded and shall be equal to or below those times stipulated in the approved documentation, if any. This also includes when passing through the *bsr* in reverse rotational direction, especially during the stopping test.

The engine is to be checked for stable running (steady fuel index) at both upper and lower borders of the *bsr*. Steady fuel index means an oscillation range less than 5 % of the effective stroke (idle to full index).

Additional requirements are given in Section 8, Part VII "Machinery Installations" of the Rules for the Classification and Construction of Sea-Going Ships."

APPENDIX 10

TYPE TESTING PROCEDURE FOR CRANKCASE EXPLOSION RELIEF VALVES

36 **Para 2.1** is replaced by the following text:

"2.1 The procedure has been developed on the basis of IACS Unified Requirements M66 (Rev.3 Jan 2008) "Type Testing Procedure for Crankcase Explosion Relief Valves". Where appropriate, the following normative documents may be used:", and the rest remaining as it stands.

APPENDIX 11

TYPE TESTING PROCEDURE FOR CRANKCASE OIL MIST DETECTION AND ALARM EQUIPMENT

37 **Para 2.1** is replaced by the following text:

"2.1 The Procedure has been developed on the basis of IACS Unified Requirement M67 (Rev.2 Feb 2015) "Type Test Procedure for Crankcase Oil Mist Detection and Alarm Equipment".

Where appropriate, the following normative documents may be used:

IACS Unified Requirement E10 "Test Specification for Type Approval";

RS Procedure for Testing and Drawing up Type Approval Certificates for Electrical and Electronic Automation Equipment, Computers and Peripheral Facilities;

"Standards and Methods of Testing Automation Equipment" (refer to Appendix 1 to Section 12)."

6 SHAFTING COMPONENTS

38 **Table 6.2.5** is replaced by the following:

"Table 6.2.5

Shaft length to diameter ratio	Radial run-out of shafts, mm, with the check applied to		
	journals and cones at centres		inoperative lengths at centres and on supports
	on supports	per 1 m of length	
5-20	0,04	0,04	0,073
20-25	0,05	0,06	0,08

25-30	0,055	0,08	0,087
30-40	0,06	0,09	0,093
40-50	0,07	0,12	0,10

39 **Para 6.2.16** is replaced by the following text:

"6.2.16 The finished shafts shall be subjected to the external examination. No lamination, cracks, black spots, backfins, rags, flowers, slag inclusions, sand marks, crazes, burrs and scratches shall be permitted on the shafts. The results of the shaft checks including the flaw detection results as well as the results of the measurements made shall be entered in the measurement tables (shaftline certificate, reports). Where the results of the checks, flaw detection and measurements are positive, the Register certificate issued."

7 PROPELLERS

40 **Para 7.1.22** is replaced by the following text:

"7.1.22 When the results of the survey and test are satisfactory, the Register certificate issued."