Regulation (EC) 391/2009 Art. 10.1
Mutual Recognition
Technical Review Meeting
29 November 2018 in Hamburg

Technical Review Meeting Report

November 2018

Executive Summary

A full day's Mutual Recognition Technical Review Meeting (MR TRM) was organized on 29 November 2018 at The Madison Hotel in Hamburg by the EU RO MR Group (MR Group).

The aim of the MR TRM was to:

- present the current status of the MR TR development process Tier 1 to Tier 7 products and enable the collection of feedback on MR technical issues regarding new and existing MR TRs and the MR certification process;
- introduce the status of development of the new Product Evaluation Process (PEP);
- talk about suitable (type approved) products for further MR TR development;
- discuss with industry participants their respective input and proposals.

The MR TRM was attended by representatives of the European Marine Equipment Industry and other relevant associations along with members of the EU RO MR Technical Committee to enable a two-way exchange of technical information on the development and maintenance of MR TRs.

Overall, the feeling expressed by those attending the MR TRM was, that there were useful and constructive exchange of technical and procedural information related to the MR process under a collaborative atmosphere.

Contents

Introduction

This MR TRM was organised by the EU ROs to present the current status of the MR TR development process and to enable the collection and initial discussion including review of feedbacks on MR technical issues regarding new and existing MR TRs and the MR certification process. It was also an opportunity to provide information on the existing MR TRs and related Change Requests and/or Requests for Clarification.
Further, the future model to evaluate products for the MR scheme was introduced and explained with the help of an example product as suggested by one of the participating industry representatives.

The MR TRM was attended by representatives of European based Marine Equipment Industry Associations and manufacturers along with members of the EU RO MR Technical Committee. It encouraged a two-way exchange of technical information on the development and maintenance of MR TRs. The list of representation can be found in Appendix A.

The meeting was chaired by the Technical Committee Chair of the EU RO Group (LR), supported by MR Group Secretariat and members of the EU RO MR Technical Committee. Lead AdHoc Group Risk II (ABS) presented the status of development of the revised methodology for safety criticality assessment being under review since 2017.

Details of the agenda of the MR TRM can be found in Appendix B.

The MR TRM objectives were to:

- Present the current status of the MR TR development process and collected feedback on technical issues;
- Introduce the development status of the Product Evaluation Process (PEP);
- Provide an opportunity for industry input on the development and maintenance process of Mutual Recognition Technical Requirements (MR TRs) as well as on product consideration.

This report provides an overview of presentations as delivered during the TRM and summarises the discussions and conclusions that were drawn from the MR TRM. It also lists the follow up activities.

EU RO MR Group Presentations

This paragraph summarizes the content of the presentations given by the EU ROs (Appendix C).

Presentation 1: Update on TC activities

Overview of the agenda and topics in and out of scope for the MR TRM.

- TR Development (Tier 7 industry consultation)
- TR Maintenance

Summary of the actions taken during Tier 7 TR development and the industry consultation phase of the Tier 7 MR TR development project with overview of feedbacks received so far.

Summary of TR maintenance process including industry feedback on technical issues relating to TRs that had been collected under use of the MR Group's maintenance process and procedures.

Presentation 2: Product Evaluation Process (PEP)

Introduction of the Product Evaluation Process (PEP)

Industry Presentations

This paragraph summarizes the presentations given by Industry representatives (Appendix D).

Presentation 1: Danfoss: Variable Speed Drives

Presentation 2: SIEMENS AG: Comparison pilot devices – position switches

Presentation 3: SIEMENS AG: MR TRs vs class rules

Overview of TRM Discussions

1. Introductions and welcome addresses

Introductions and welcome addresses were given by the Moderator (LR), and the EU RO MR Technical Committee Chair (LR) followed by an introduction round table of the meeting participants.

The Moderator introduced the aim and objectives of the meeting, reminding that all EU ROs are competitors, and emphasizing that no business model related topics, no political discussions, no lobbying and or questions related to IACS involvement are seen as appropriate.

The Moderator reminded that the TRM is a workshop style meeting focussing on the exchange of technical issues, gathering issues of interest from the participants.

After a welcome note by TC Chair, the Moderator addressed the participants emphasizing that the TRM is intended to be the forum for focusing on technical and procedural related aspects of the TR development process to improve the effectiveness of product related technical requirements, but also on the implementation and maintenance process of existing TRs.

An introductory tour de table allowed for an overview over the background of the participants.

Danish Maritime (DM) representative and lead of the Class Group in SEA E acknowledged that the meeting is to discuss technical issues, but that the meeting is also seen as part of the process to lead to a certification regime scheme that is more cost effective and reduces administrative burden.

The MR Group's Technical Committee Chair introduced the meeting agenda.

The Moderator presented the governance of the MR Group as backbone of the work to comply with Art 10 (1), Reg 391/2009, reiterating that the rules of competing class societies serve as basis for the development of the TRs. As the first contact, Secretariat is the entry point of all inquiries coming from stakeholders.

2. Update on TC activities

TC Chair lead through the technical work of the MR Group, starting with an overview of the status of certificates as a breakdown by region and by product group. TC Chair then presented the TC involvements, outlining the developments since the last TRM and improvements of procedures and resulting documents to ensure consistency in the implementation and maintenance of TR's, (Request for Clarification [RfC], Change request [CRF], Alert Process, Maintenance Procedure, Product Consideration Process [PCP]).

It was highlighted that the new and improved website now offers a more user- friendly layout and providing comprehensive information on MR processes.

Participants were reminded to subscribe to the website to get alert for news and thus get access to the information provided by the MR Group.

TC Chair presented details and examples of the technical and procedural work in 2018 and gave an outlook on the future work (e.g. finalize Tier 7, TR maintenance with reference to alignment

proposals, consistency and simplification aspects). She further explained the status of TR development asking industry to further support the development by suggesting products/ products groups to be evaluated using the future Product Evaluation Process (PEP).

It was explained that the revised risk model will be presented to the industry in this meeting for the first time. It was emphasized that this model is still under development based on results and feedback from test cases and one pilot case. The old SRBM is still valid and to be used for the time being. It might be used on base of exceptional cases as a generic model, but it is still subject to adaption to incorporate the lessons learnt and industry comments, once made available in a consultation phase.

It was explained that when deciding how to set up the risk assessment methodology, other standardization entities assessing risks have been inquired and the MR Group made a comparison of existing models to find a way to simplify the approaches to serve the purpose of complying with Art 10(1) of Regulation 391/2009. This led to the first risk model (SRBM). The further development of this model serves the purpose to enable application of more filters to allow a more complex review and to give better technical background on the process and product.

Once the PEP Model is in the stage that it is ready, the MR Group strives for a system through the website, where the experts can directly go through the PEP process, so that it is as transparent and useable as possible.

However, for the time being, the model is under development. A test phase has been arranged to feedback experience with the lessons learnt. The test case product that was presented during the meeting (Variable Speed Drives, VSD) had been tested on the basis of the current status of the new model. The same product was previously not assessed eligible for MR.

On a question related to the referencing of standards, TC Chair explained that the Technical Requirements are based on the most stringent requirement, so whatever standard is used in individual TACs, the MR Group needs to rely on the individual class rules with the highest standard.

Industry was encouraged to raise questions related to the referencing of standards to the MR Group in writing, if further details are required.

TC Chair provided a summary of the TR maintenance process including industry feedback on technical issues relating to TRs that had been collected under use of the MR Group's maintenance process and procedures.

With regard to the maintenance process of existing TRs it was outlined that the process will need to be brought into the next iteration to accommodate for the comments that have been.

TC Chair presented the principles of maintenance and the maintenance status of MR TR as of Nov 2018 as well as the status of certificates issued for individual product groups. The trend of rising number of certificates issued shows a positive trend.

TC Chair presented considerations regarding the review of existing TRs in a maintenance process, taking into consideration the no. of certificates issued. The content of review is envisaged to include testing requirements, referenced standards, updates of standards, references to other TR', editorial alignment and limitations and their origin.

The MR Group shared first ideas on product grouping and the approach.

Industry input during consultation phase

The Moderator stated that there was a relatively low interest from industry with regard to the technical consultation process of Tier 7 product TR development (only 2 comments received on the draft Tier 7 TRs).

SIEMENS corrected the impression that they as a company have provided direct comments. The comments have been provided through IEC Standards Committee and not from SIEMENS.

Product Evaluation Process (PEP)

The Lead AdHoc Group Risk II (ABS), introduced the principles and current status of the Product Evaluation Process (PEP).

The concept was explained, and questions were clarified or taken on board for further consideration. The MR Group explained the intention to publish the PEP on the website to enable manufacturers to make a pre-assessment whether their products can be considered for MR and can subsequently be developed. Guiding questions will support the assessment process. Any type of product can be assessed under PEP.

Two manufacturers raised the question whether in case of an integrated system, an MR certified component can potentially be part of achieving the unit certification. In this context, it was clarified that individual TA certificates cannot correlate with the MR TAC process.

FUA 1: Establish a respective position (MR Group)

A manufacturer shared his experience that there is always the need to have two certificates: TAC together with MR TAC due to non-acceptance of MR TAC by non-EU flag states.

Questions were clarified on the important concept of all ROs that if it comes to system integration, ROs need to always look at the application limitation and whether a product is intended to be integrated into the essential systems.

A manufacturer brought up the question how to go forward with MR TAC to be integrated in systems and what effect such integration does have on the software, i.e. how can software be handled in the MR scheme. This question will be discussed further by the MR Group, e. g. to state software limitations on the certificates, which would require not to change the versioning.

FUA 2: Address how to handle software in the MR scheme (MR Group)

FUA 3: Update the PEP model, and – upon approval - present it to the industry for consideration (industry consultation) (MR Group)

Presentations by Industry

Danfoss on Variable Speed Drives

Danfoss appreciated that the MR Group has already addressed the proposal for product consideration. 90% of their products are of shelve for which MR certification would be favourable in the market. The respective benefits for Danfoss were highlighted.

Based on previous contacts, their product Variable Speed Drives (VSD) was tested to the new PEP-MR by the TC members of each EU RO with the following results: All reviewers except one found the VSDs to be eligible for MR, however, EU RO‘s Rules limit eligibility for MR when the VSDs are above a certain capacity (kW, kVa) and intended to be installed in an essential services system.

FUA 4: Further work on this test case in cooperation with Danfoss (Technical Committee)

SIEMENS AG: Comparison pilot devices – position switches

SIEMENS elaborated on inconsistencies between the TR Pilot Devices Version 0.1, adoption date 1 July 2018 and the draft TR Position Switches Version 0.0, adoption date 1 January 2019 and proposed possible solutions for alignment. This input was already handed in to the MR Group during the industry consultation phase for the TR development and has been handled by the MR Group. Partly, the proposals have already been taken on board (Position Switches), partly the proposals will be considered in the maintenance cycle (Pilot Devices).

FUA 5: Justification Letter will be sent in reply to the input by IEC Standards Committee during the industry consultation phase of Tier 7, SIEMENS reading in copy (Secretariat)

SIEMENS will be informed about the outcome of the respective maintenance activities

SIEMENS AG: MR TR versus class rules

SIEMENS exemplified that individual class societies only have one document for different kind of devices, where TRs are individual documents covering related fields. There is for example only one class rule document versus 8 MR TRs for low-voltage switchgears.

One EU RO commented that they have one dedicated document for each product in order to provide unambiguous requirements. It has to be taken into account that MR needs to cover several competitors, so there are advantages and disadvantages with the setup.

SIEMENS made a general comment on combining similar products into one TR and suggested that the reduction of different MR TRs to one document would avoid effort and confusion and proposed to establish one MR TR for all low-voltage devices in accordance with the already existing class rules of the individual class societies.

SIEMENS further commented on harmonising technical documentation for similar products and in particular advocated for harmonizing type testing requirements. The comment was supported by the example of EMC criteria's.

SIEMENS observed that in individual class rules tests are independent of the devices and that test descriptions are separate.

FUA 6: Take the grouping proposal by Siemens into consideration (MR Group)

Any Other Industry Comments

Brunvoll raised the question whether Material is subject to MR. The MR Group replied that Material is not yet addressed. System consists of sub-systems and material. The MR Group reiterated their position.

Brunvoll further observed that TRs seem to be very prescriptive and inquired whether the MR Group has considered to make them function/goal based. It was explained that the most stringent standards have to be used, which is prescriptive.

To Brunvoll it appears that there may be a challenge with regard to transpareny of the PEP Model. The MR Group explained that the TRM 2018 is the first time to publish the the PEP and that the MR Group is grateful for any comments. The MR Group notified the participants that there will be an industry consultation phase on the PEP and offered to clarify any questions also individually, if approached.

Kongsberg commented on the harmonisation of EMC testing requirements with applicable international standards for similar products.

FUA 7: Take the EMC proposal by Kongsberg into consideration (MR Group)

Kongsberg inquired about global acceptance of MR TAC, reiterating that 85% of the world fleet is flying under non-EU flags. Due to the lack of global acceptance, Kongsberg observe insecurity for suppliers.
The MR Group explained that MR is subject to flag state sovereignty in non-EU flag states (Recital 25) and that this question could be raised to DG MOVE.
Reference was made to the factual report summarizng the arguments given at the EU RO MR Workshop, 5th September 2018, which can be found on www.euromr.org.
In this context it was also mentioned that in 2009, reduction of trade barriers was one of the aims of Art 10(1), but that no impact analyses have been exercised.

Kongsberg further asked the MR Group to counteract arguments that doubt the quality of MR TACs, as they should have the same quality, globally. It was clarified that TRs respect the most rigourous standards. They suggested that this could be better displayed on the MR TAC with a respective remark on the certificate.

FUA 8: Revisit the minimum contents on the MR TAC (MR Group)

The representative of the Society of Maritime Industries/UK inquired whether the MR Group has benchmarked the timing of the MR process.
It was explained that the MR TR process follows a strict milestone process. Regarding the turnaround time for certification, it was mentioned that individual class societies do have respective KPIs .

Conclusions

The MR TRM 2018 covered a wide range of issues related to

- the status of the product evaluation process (PEP Model)
- the MR TR development process
- the MR TR maintenance process
- the processes to maintain certification integrity under MR

and how to handle specific topics as raised by industry representatives.

The MR Group thanked all participants for their engagement, the valuable contributions and the fruitful discussions. It was concluded that the TRM fulfilled the aim to inform about the latest status and to share ideas and proposals to enhance the processes.

Action List - Technical Review Meeting, 29 November 2018, Hamburg

Actions for EU RO Group:

No.	Issues Raised
1.	**Establish a respective position (MR Group)**
2.	**Address how to handle software in the MR scheme (MR Group)**
3.	**Update the PEP model, and – upon approval - present it to the industry for consideration (industry consultation) (MR Group)**
4.	**Further work on this test case in cooperation with Danfoss (Technical Committee)**
5.	**Justification Letter will be sent in reply to the input by IEC Standards Committee during the industry consultation phase of Tier 7, SIEMENS reading in copy (Secretariat)**
6.	**Take the grouping proposal by Siemens into consideration (MR Group)**
7.	**Take the EMC proposal by Kongsberg into consideration (MR Group)**
8.	**Revisit the minimum contents on the MR TAC (MR Group)**

Actions for Industry Associations:

No.	Issues Raised

Appendices

Appendix A: List of TRM Participants

Participants

EU RO MR Group

EU RO MR TC CHAIR (LR)

EU RO MR Secretary

EU RO MR Secretariat

ABS SC Member

BV TC Member

CCS SC Member

CRS TC Member

DNV GL TC Member

IRS TC Member

KR TC Member

LR SC Member

NKK TC Member

PRS TC Member

RINA TC Member

RS TC Member

Industry

Brunvoll AS

Danish Maritime (DM)

Eaton

VSM

Schneider Electic

Kongsberg Maritime ASA

Federation of Norwegian Industries

Rolls Royce Marine AS

SEA Europe

Siemens AG

Danfoss Drives A/S

Danfoss Drives A/S

Society of Maritime Industries/UK

Netherlands Maritime Technology

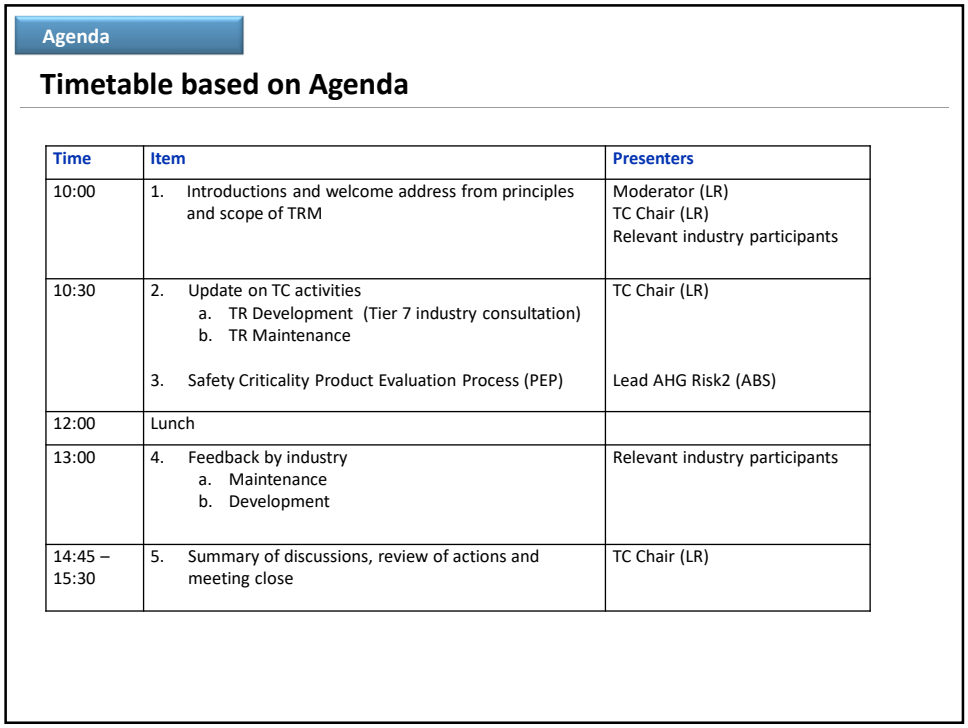
Appendix B: MR TRM Agenda

Meeting Type: 4th Industry Technical Review Meeting
Location: Hamburg, The Madison Hotel
Date: Thursday, 29 November 2018
Start Time: 10h00 (local time)

AGENDA

Time	Item	Presenters
10:00	1. Introductions and welcome address from: a. EU RO MR Group; b. Relevant industry participants;	Moderator (LR) TC Chair (LR) Relevant industry participants
10:30	2. Product Evaluation Process (PEP)	Lead AdHoc Group Risk2 (ABS)
12:00	Lunch	
13:00	3. Update on TC activities: a. TR Development (Tier 7 industry consultation) b. TR Maintenance	TC Chair (LR)
14:00	4. Feedback by industry a. Maintenance b. Development	Relevant industry participants
15:00-15:30	5. Summary of discussions, review of actions and meeting close	TC Chair (LR)

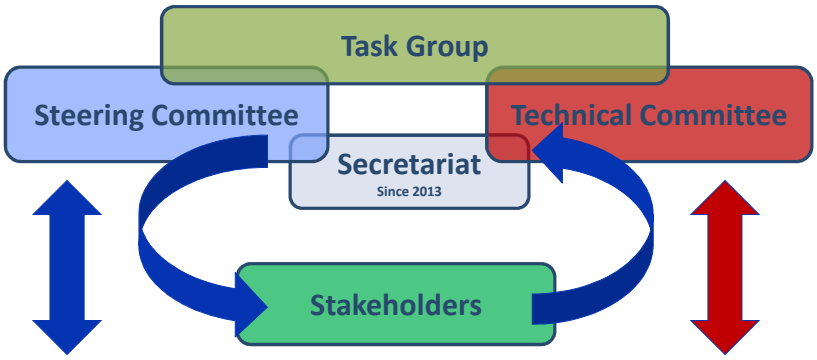
Appendix C: EU RO MR Group Presentations



Time	Item	Presenters
10:00	1. Introductions and welcome address from principles and scope of TRM	Moderator (LR) TC Chair (LR) Relevant industry participants
10:30	2. Update on TC activities a. TR Development (Tier 7 industry consultation) b. TR Maintenance 3. Safety Criticality Product Evaluation Process (PEP)	TC Chair (LR) Lead AHG Risk2 (ABS)
12:00	Lunch	
13:00	4. Feedback by industry a. Maintenance b. Development	Relevant industry participants
14:45 – 15:30	5. Summary of discussions, review of actions and meeting close	TC Chair (LR)

Agenda item 1– Introduction and Principles EU RO MR Group

Introduction and Principles of the EU RO MR Group



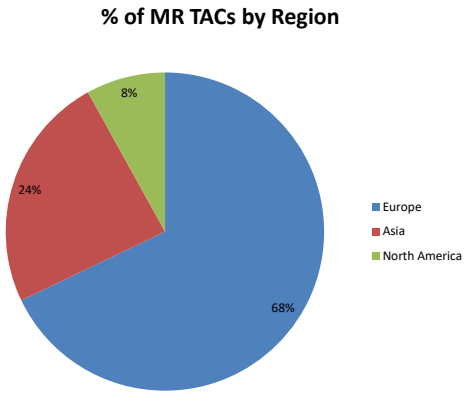
- Decisions and guidance within EU RO MR Program, overall responsible and ensuring compliance
- TRM Meeting are an integrated part of the MR group activities with solely focusing on technical and related procedural TR Development processes

Agenda item 1– EU RO MR Group

Status of Mutual Recognised TA Certificates

Some statistics as per November 2018

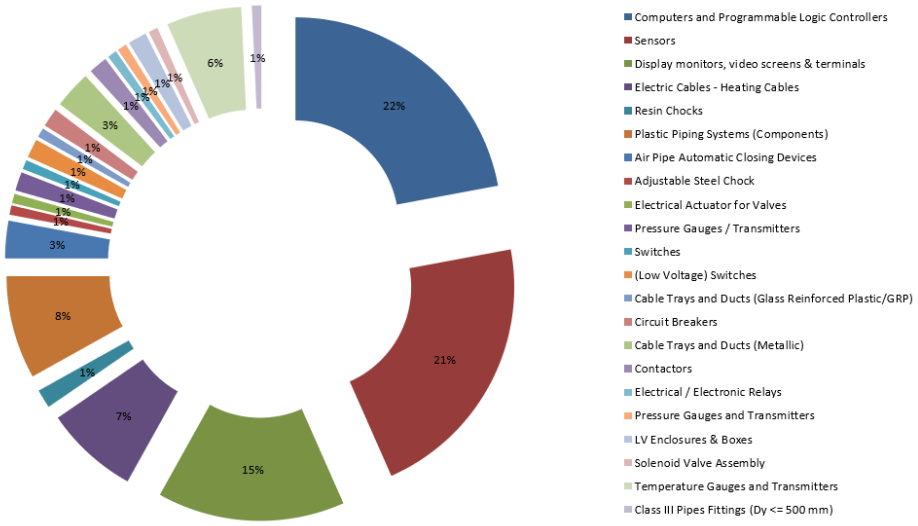
- Through development and application of transparent procedures and processes, 138 MR Type Approval Certificates have been issued
(as of November 2018)
- This has seen global coverage



Agenda item 1– EU RO MR Group

Status of Mutual Recognised TA Certificates

Status November 2018 - % of MR TACs Issued by Product



Agenda item 2– Update on TC activities

TC involvements since last TRM

- Development/ improvement of procedures and resulting documents to ensure consistency in the implementation and maintenance of TR's, (Request for Clarification [RfC], Change request [CRF], Alert Process, Maintenance Procedure, Product Consideration Process [PCP])
- Renewal and improvement of the new web site aiming to a more user friendly layout and providing comprehensive information on MR processes
- Participation in the Task Group to consider feedback by stakeholders to current criticality assessment methodology

Agenda item 2– Update on TC activities

YTD Activities

Technical related activities

- TR and TI for Plastic Piping System" finalized and approved
- TR for "Sensors" finalized and approved
- TI for definition of fishing vessels finalized for TR Sensors finalized
- Clarification of application limitation for TR Electric/ Electronic Relay finalized
- Alignment of TR's in regards to reference standard for test requirements finalized
- Analysis of Industry feedback

Procedural related activities

- Task Group Referencing of Standards
- Several workshops conducted to review and revise former ERM
- Results of workshop presented to AdHoc Risk Group II for further elaboration and implementation
- Test cases prepared and discussed to verify functionality of PEP, e.g. pilot " variable speed drives"

Agenda item 2– Update on TC activities

Ongoing Activities

- TR Maintenance in regards to alignment proposals, consistency and simplification aspects
- TR Development (Industry to support further TR development to allocate further products/ products groups to be evaluated using PEP)
- Feedback to SC for process adjustment needs

Agenda item 2– Update on TC activities

Future Activities

Status of new proposed MR TR Development products in 2018

- Anti Chafing Chain : not eligible
- Pilot: Variable Speed Drives: not eligible
- Insulation Monitoring / Insulation Fault Detectors: ready for development

Impact:

Revision to TR Development cycle:

Starting January 2019 the MR group decided to initiate maintenance work on the 62 existing TRs and to further continue the TRs development process based on itemized approach in order to be more time flexible for new products

- Finalize Tier 7

Agenda item 2– Update on TC activities

TR Development
Feedback from Industry

Tier 7 Technical Requirement	Industry Consultation Phase
Differential Pressure Switches	
Dual Temperature and Pressure Switches	
Flow Switches	
Level Switches	
Position Switches	IEC Standards Committee
Pressure Relief Valves in Level III Piping Systems	
Pressure Switches	
Temperature Switches	

Agenda item 2– Update on TC activities

TR Development
Feedback from Industry

Industry feedback in regards to Tier 7 development are related to:

- application limitations in regards to voltage ranges according applicable IEC standard
- type testing requirements in regards to EMC criteria's if applicable
- general comment on combining similar products into one TR
- general comment on harmonising technical documentation for similar products

Agenda item 2– Update on TC activities

TR Development
Feedback from Industry

Based on limited number of comments received by Industry (1 TR only), it is concluded that TR's are found satisfactory for the concerned products and can be further used by the industry.

Agenda item 2– Update on TC activities

TR Maintenance

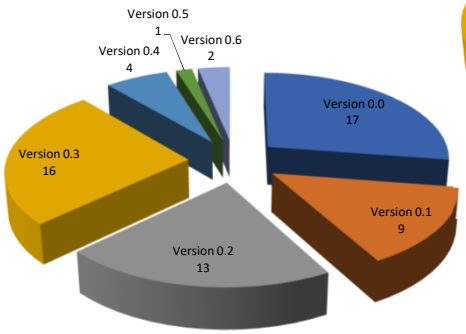
2 independent maintenance trigger for yearly maintenance

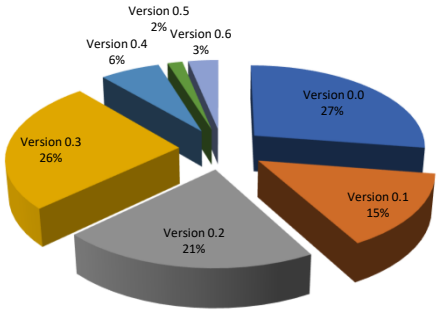
- Periodical review:
  Update on Rule development and impact to existing TR's
  Review of CRF and conclusions and impact analysis to existing TR's

- Annual Review
  Review of TI and impact analysis to existing TR's

Agenda item 2– Update on TC activities

Status of Mutual Recognised TR November 2018

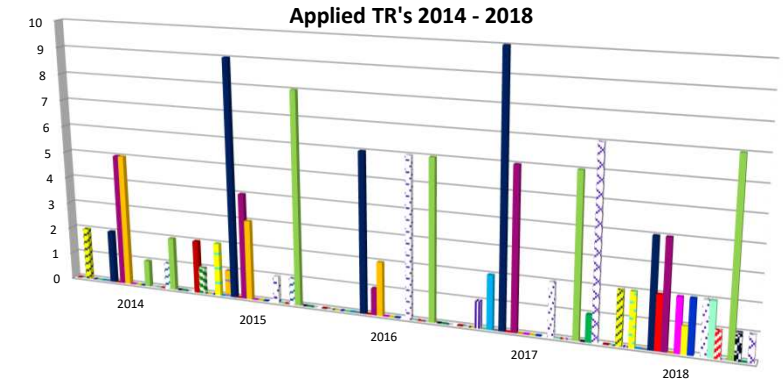




- TR's been frequently reviewed and revised were appropriate
- Process of revision currently under consideration to improve efficiency of group activities and faster response to Industry changes
- More than 700 reviews have been conducted on all existing TR's

Agenda item 2– Update on TC activities

TR Maintenance

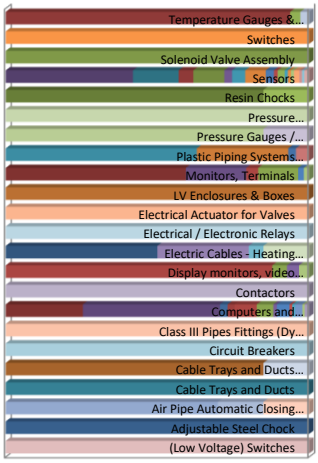


(Low Voltage) Switches
Adjustable Steel Chock
Air Pipe Automatic Closing Devices
Cable Trays and Ducts
Cable Trays and Ducts (Metallic)
Circuit Breakers
Class III Pipes Fittings (Dy <= 500 mm)
Computers and Programmable Logic Controllers
Contactors
Display monitors, video screens & terminals
Electric Cables - Heating Cables
Electrical / Electronic Relays
Electrical Actuator for Valves
LV Enclosures & Boxes
Plastic Piping Systems (Components)
Pressure Gauges / Transmitters
Pressure Gauges/Transmitters
Resin Chocks
Sensors
Solenoid Valve Assembly
Switches
Temperature Gauges & Transmitters

Agenda item 2– Update on TC activities

TR Maintenance

Breakdown of TR Application by Stakeholders



Most applied TR's are:

1. Computers and Programmable Logic Controllers
2. Sensors
3. Display monitors, video screens & terminals
4. Plastic Piping Systems (Components)
5. Electric Cables - Heating Cables
6. Temperature Gauges & Transmitters
7. Air Pipe Automatic Closing Devices and Cable Trays and Ducts (Metallic)
8. Switches
9. Circuit Breakers, Contactors, Electrical / Electronic Relays, LV Enclosures & Boxes, Pressure Gauges / Transmitters and Resin Chocks
10. Adjustable Steel Chock, Cable Trays and Ducts , Class III Pipes Fittings, Electrical Actuator for Valves, Pressure Gauges/ Transmitters, Solenoid Valve Assembly

Agenda item 2– Update on TC activities

TR Maintenance

TR maintenance Proposal (under consideration)

- review the existing scope. Start with 12 TR's from similar product groups and finalize yearly 12 TR's

a) Content of review:

- testing requirements
- referenced standards
- updates of standards
- references to other TR's
- editorial alignment
- limitations and their origin

Agenda item 2– Update on TC activities

TR Maintenance

TR maintenance Proposal (under consideration)

b) Approach:

- Compile similar products from their product description and applicable product standards for all exiting TR's to select 12 TR's
- Mapping of design requirements
- Mapping of test requirements
- Elaborate references to other TR's
- Elaborate limitations
- Agree text modules for product description, design, testing, limitations

Agenda item 2– Update on TC activities

TR Maintenance

TR maintenance Proposal (under consideration)

Possible product groups

Electronic equipment (Computers, PLC, Monitors Touch Screens, Electronic Relays, Actuator..)
Measuring equipment (Gauges, Sensors…)
Electrical power equipment (Switches, CB, Contactors, Battery Charger ….)
Control elements (Pilot devices, Sensors, Contactors, Actuator
Valves
Piping Systems
Cables

Agenda item 3 – Product Evaluation Process

Product Evalutation Process Development Steps

Product Evaluation Process – PEP-MR

Developments:

- Existing Methodology for Safety Criticality Assessment under review since 2017
- PEP-MR methodology developed to follow requests from stakeholders to focus more on technical aspects of eligibility assessment: April – October 2018
- Initial Group approval granted Oct 2018, including following documents:
  - PEP-MR
  - Revised Definitions as applicable to the model
- Transmitted to TC for evaluation & testing with product test cases
- PEP-MR introduced to industry representatives during the TRM meeting
- Guiding Questions / Instructions under development to assist with the implementation and future application the process

Agenda item 3 – Product Evaluation Process

Product Evaluation Process

Product Evaluation Process – PEP-MR

Improvements over Simplified Risk Based Model (SRBM)

- Moved away from Opt-In, Opt-Out Question Format
- Changed from generic questions to more technically focused criteria based on Class Rules and regulatory requirements, as applicable
- Assessment Process consisting of 3 Levels of Evaluation
  - Basic Evaluation → focusing on applicable Standards & Regulations
  - Product Evaluation → focusing on type of product and Rule Requirements for Design Assessment / Survey
  - System Evaluation → focusing on integration and application case of product in Ship's System
- Can be applied by any EU RO in conjunction with their Rules
- Transparent Evaluation Process – to be publically available and usable by industry and manufacturers to test eligibility of their products

Thank you!

Appendix D: Industry Presentations

EU RO MR Group
Technical Review Meeting 2018

Hamburg, 29 November 2018

DANFOSS Presentation

EU RO MR Technical Review Meeting Oct, 29th 2018

ENGINEERING TOMORROW

Variable Speed Drives (VSD) in general

Basic functionalities:

- Controls electric motors depending on application
- Can change speed and torque on the motor

Advantages:

- Save energy and improve efficiency of systems
- Matches speed, torque or power of a drive/motor to the application
- Reduce mechanical stress on machines
- Lower noise levels and improved working environment

Danfoss VSD Type Approvals

DNV-GL — *Established in 1864, DNV GL is an independent foundation with the objective of safeguarding life, property and the environment.*

KR (KOREAN REGISTER) — *KR is a world-leading, technical advisor to the maritime industry. About 70 flag administrations have authorized KR to conduct statutory surveys on their behalf.*

Lloyd's Register — *The Lloyd's Register Group is an organization that works to enhance safety and to approve assets and systems at sea, on land and in the air.*

ABS — *Since its founding in 1862, the American Bureau of Shipping (ABS), a New York not-for-profit corporation, has been committed to setting standards for safety and excellence as one of the world's leading ship classification societies.*

Founded in 1956, China Classification Society (CCS) is the only specialized organization of China to provide classification services. CCS aims to provide services for the shipping, shipbuilding, offshore exploitation and related manufacturing industries and marine insurance.

A classification society, the Russian Register, was established on 31 December 1913. Now its name is the Russian Maritime Register of Shipping (RS). Since 1969 RS has been a member of the International Association of Classification Societies (IACS).

BUREAU VERITAS — *Founded in 1828, Bureau Veritas was one of the first classification societies and a founding member of IACS (International Association of Classification Societies in the world).*

The Rina Group's main activity areas are ship classification, certification and advanced services to industry.

ClassNK — *Class NK (Nippon Kaiji Kyokai) is a Japanese ship classification society dedicated to ensuring the safety of life and property at sea, and the prevention of pollution of the marine environment.*

Danfoss VSD in Marine applications

Crane
- Elimination of hydraulic fluid leakages
- Only marginal losses in standby mode
- High efficiency during normal operation
- Environmentally friendly and efficient system

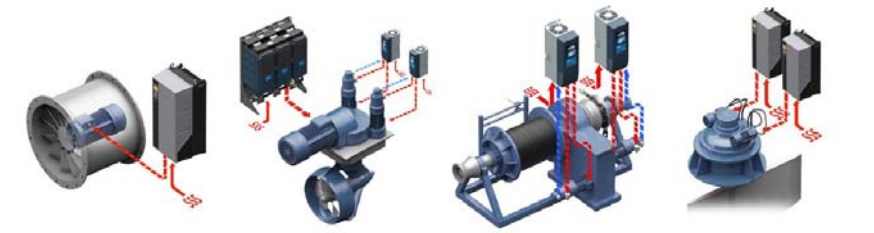
Refrigeration compressors
- Improved efficiency
- Built-in compressor control functions
- Improved compressor lifetime

Separators
- High operation reliability
- Low maintenance cost
- Safe Maximum Speed (SMS) safety function without external speed sensor

Pumps
- Built-in pump features
- Automatic Energy Optimizer (AEO) saving additional 5-15%
- Pay back down to 12 months using speed controlled pumps

Taken from catalogue page 22.

Danfoss VSD in Marine applications



Fan and ventilation
- Typically 30-50% energy savings
- Reduced acoustic noise
- Fire mode improves safety in HVAC systems

Thrusters
- Safe and precise maneuverability
- 20-30% energy savings compared to variable pitch thrusters
- Low maintenance cost

Winch
- No risk of hydraulic fluid leakages
- Low energy consumption and no stand-by losses
- Low acoustic noise level

Steering gear
- Fast and precise rudder positioning
- Extremely safe due to live back-up system
- More than 70% energy savings compared to fixed speed hydraulic pump system

Taken from catalogue page 23.

Advantages of VSD in EU RO MR

- Simple and less time consuming certification, benefitting Danfoss, customers and certification societies.
- Clear requirements for product design making it easier to scope, design and develop new products.
- One set of Marine requirements reduce cost of development and thereby selling price on our products, lowering price on marine projects in general.
- Shipbuilders can easily use the same product for ships sailing under a flag from EU.
- LV Soft starters are already in scope today (Tier 5, no. 51), and VSD resembles them.

EU RO MR Group
Technical Review Meeting 2018

Hamburg, 29 November 2018

Siemens AG DF CP
Comparison pilot devices – position switches

EU RO Technical Review Meeting: Tier 5

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EU RO Technical Review Meeting: Pilot devices – Position switches References

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Extracts are taken from:

- **TR Pilot Devices Version 0.1, Adoption date 1 July 2018**
- **Draft TR Position Switches Version 0.0, Adaption date 1 January 2019**
- **IEC 60947-5-1, Edition 4.0, 2016-05**

→ Extracts are taken from the newest version

EU RO Technical Review Meeting: Pilot devices – Position switches Application limitations: here voltages

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- **Pilot Devices**
  a) The rated voltage of pilot devices shall be up to 1000V a.c. (50/60 Hz) or 600V d.c. according to IEC60947-5-1;
- **Position Switches**
  a) These technical requirements are applicable to position switches for control, safety or alarm device of plant or system on board with rated voltage in electric circuit not exceeding 1000 V a.c. or 1500 V d.c.;
- **IEC 60947-5-1**
  It applies to control circuit devices having a rated voltage not exceeding 1 000 V a.c. (at a frequency not exceeding 1 000 Hz) or 600 V d.c.

→ **Correct TR Position switches to 600V d.c.**

EU RO Technical Review Meeting: Pilot devices – Position switches Technical Requirements

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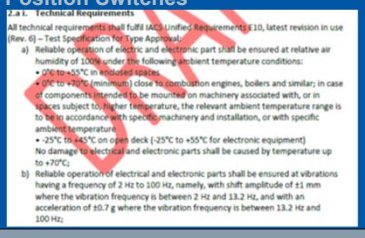
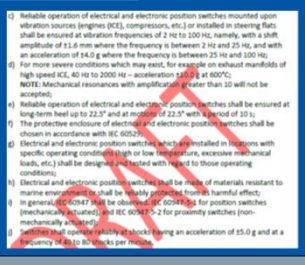
- **Pilot Devices**
  2.a i. Technical Requirements
  a) Pilot devices shall be complied with the requirements of IEC 60947-5-1;
  b) Emergency stop devices with mechanical latching function shall be complied with IEC60947-5-5;
  c) Type, ratings and characteristics of pilot devices for intended applications shall be evaluated;
  d) Dependency of external control power shall be evaluated.
- **Position Switches**


2.a i. Technical Requirements
All technical requirements shall fulfil IACS Unified Requirements E10, latest revision in use (Rev. 6) – Test Specification for Type Approval:
a) Reliable operation of electric and electronic part shall be ensured at relative air humidity of 100% under the following ambient temperature conditions:
• 0°C to +55°C in enclosed spaces
• 0°C to +70°C (minimum) close to combustion engines, boilers and similar; in case of components intended to be mounted on machinery associated with, or in spaces subject to, higher temperature, the relevant ambient temperature range is to be in accordance with specific machinery and installation, or with specific ambient temperature
• -25°C to +45°C on open deck (-25°C to +55°C for electronic equipment)
No damage to electrical and electronic parts shall be caused by temperature up to +70°C;
b) Reliable operation of electrical and electronic parts shall be ensured at vibrations having a frequency of 2 Hz to 100 Hz, namely, with shift amplitude of ±1 mm where the vibration frequency is between 2 Hz and 13.2 Hz, and with an acceleration of ±0.7 g where the vibration frequency is between 13.2 Hz and 100 Hz;


c) Reliable operation of electrical and electronic position switches mounted upon vibration sources (engines (ICE), compressors, etc.) or installed in steering flats shall be ensured at vibration frequencies of 2 Hz to 100 Hz, namely, with a shift amplitude of ±1.6 mm where the frequency is between 2 Hz and 25 Hz, and with an acceleration of ±4.0 g where the frequency is between 25 Hz and 100 Hz;
d) For more severe conditions which may exist, for example on exhaust manifolds of high speed ICE, 40 Hz to 2000 Hz – acceleration ±30.0 g at 600°C;
NOTE: Mechanical resonances with amplification greater than 10 will not be accepted;
e) Reliable operation of electrical and electronic position switches shall be ensured at long-term heel up to 22.5° and at motions of 22.5° with a period of 10 s;
f) The protective enclosure of electrical and electronic position switches shall be chosen in accordance with IEC 60529;
g) Electrical and electronic position switches which are installed in locations with specific operating conditions (high or low temperature, excessive mechanical loads, etc.) shall be designed and tested with regard to those operating conditions;
h) Electrical and electronic position switches shall be made of materials resistant to marine environment or shall be reliably protected from its harmful effect;
i) In general, IEC 60947 shall be observed, IEC 60947-5-1 for position switches (mechanically actuated), and IEC 60947-5-2 for proximity switches (non-mechanically actuated);
j) Switches shall operate reliably at shocks having an acceleration of ±5.0 g and at a frequency of 40 to 80 shocks per minute.

→ **Allign especially in respect to environmental categories**

EU RO Technical Review Meeting: Pilot devices – Position switches EMC Requirements

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- **Pilot Devices**

  h) Electromagnetic compatibility (EMC) to be tested in accordance with the procedures indicated in the IACS UR E10 or in accordance with IEC 60947-4-1, with the severity conditions set by the IACS UR E10 as a minimum;

- **Position Switches**
  → EMC Requirements according IEC 60947-5-1 and IEC 60947-5-2 are missing

→ Replace IEC 60947-4-1 with IEC 60947-5-1 for pilot devices

→ Include EMC requirements for position switches

EU RO Technical Review Meeting: Pilot devices – Position switches Technical documents to be submitted

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- **Pilot Devices**

2.a.ii. Technical documents to be submitted

Prior to tests:

a) Proposed test program and test schedule;
b) Description of the test specimens and explanation of the selected test sample(s) providing evidence that the selected sample meets the most rigorous and demanding requirements;
c) Product descriptions, data sheets, assembly drawings, dimension drawings etc. clearly identifying the product;
d) Complete accreditation certificate of the Test laboratory (prior the first test only; changes in the scope of accreditation shall also be advised);
e) Details of production sites;
f) Product specification;
g) Application, working area;
h) Instructions on fitting, assembly and operation;
i) QM-certificate according to ISO 9001.

After completion of tests:

j) The test report with an identification number shall contain all relevant data and test results including place and date of the tests, the names of the responsible personnel carrying out the test;
k) Type references and serial numbers of the products tested;
l) Test reports and test records shall be signed by the personnel members in charge of the test and are to be confirmed by the EU RO by signing and marking the test report.

- **Position Switches**

2.a.ii. Technical documents to be submitted

a) Explanatory note with description of the principle of operation and structural data of the position switch;
b) Specification with indication of the devices and appliances used and the technical characteristics thereof;
c) General view drawings, structural units, appliances and instruments;
d) Functional block diagrams of the article with indication of input and output signals, feedbacks, self-monitoring system, etc.;
e) In case when explosion-proof position switches are used, Certificates issued by competent authorities in accordance with requirements of EN/IEC 60079 series should be provided;

f) The technical documentation must make it possible to assess the product's compliance with the agreed technical requirements, as described in the item 2.a i. (Technical Requirements) above;
g) Test programme with reference to relevant standards.

→ Allign technical documents

EU RO Technical Review Meeting: Pilot devices – Position switches Summary

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- Pilot Devices and Position Switches are covered in one IEC –standard (IEC 60947-5-1)
- Different requirements/ratings, etc. are identical (voltages, contact-ratings, enclosure ratings, etc.)

→ **Make one TR for both products to avoid differences**

EU RO Technical Review Meeting: Tier 5

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Ingenuity for life

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EU RO MR Group
Technical Review Meeting 2018

Hamburg, 29 November 2018

Siemens AG DF CP
MR TR versus class rules

MR TR versus class rules

Content

MR TR versus class rules

Overview of MR Technical Requirements and class rules

Class rules (one document)

BV:	Automation
ABS:	electrical equipment
CCS:	electrical installations
DNV GL:	electrical, electronic and programmable equipment and systems
LR:	Electrical Equipment, Control and Monitoring Equipment, Instrumentation and Internal Communication Equipment, Programmable Electronic Systems
MRS:	Electrical equipment
NK:	Control and Instrumentation equipment and electrical installations
RINA:	Automation

Only one document for different kind of devices

MR TR versus class rules

Overview of MR Technical Requirements and class rules

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Example

DNV GL: electrical, electronic and programmable equipment and systems

Environmental type test specification.........
1 General...
2 Visual inspection.......................................
3 Performance test.......................................
4 Electrical power supply failure test.........
5 Power supply variation tests...................
6 Vibration tests...
7 Dry heat test..
8 Damp heat test..
9 Cold test..
10 Salt mist test..
11 Inclination test..
12 Insulation resistance test......................
13 High voltage test....................................
14 Electromagnetic compatibility (EMC)......
15 Special purpose tests............................
16 Additional tests......................................

Tests are independent of the devices

MR TR versus class rules

Overview of MR Technical Requirements and class rules

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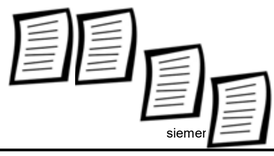
class rules (one document)

	MR Technical Requirements	Ver-sion	Application Date	Tier
1	Sensors	0.3	01/10/2016	1
2	Circuit Breakers	0.4	01.10.2016	
3	Contactors	0.4	01.10.2016	
4	Display Monitors, Video Screens, Terminals	0.3	01/10/2016	
5	Electric Driven Motors < 20kW	0.3	01.10.2016	
6	Fuses	0.3	01/10/2016	
7	LV Enclosures & Boxes	0.3	01.10.2016	
8	Mechanical Joints	0.3	01/10/2016	
9	Resin Chocks	0.3	01/10/2016	
10	Switches	0.4	01/10/2016	
11	LV Transformers	0.3	01/10/2016	
12	Flameproof Luminaire (Lighting Fixture)	0.3	01.10.2016	2
13	Accumulator Battery	0.3	01/10/2016	
14	Air Pipe Automatic Closing Device	0.3	01.10.2016	
15	Cable Ties	0.3	01.10.2016	
16	Class III Pipe Fittings	0.3	01.10.2016	
17	Computers and PLCs	0.3	01.10.2016	
18	Electric Cables – Heating Cables	0.3	01.10.2016	
19	Electrical/Electronic Relays	0.3	01.10.2016	
20	Expansion Joints	0.3	01.10.2016	
21	Plastic Piping Systems (Components)	0.3	01/10/2016	
22	Spark Arresters	0.3	01/10/2016	
23	Air Compressor	0.2	01.10.2016	3
24	Battery Chargers	0.2	01.10.2016	
25	Boiler Remote Level Indicator	0.2	01.10.2016	
26	Cable Trays & Ducts (Glass Reinforced Plastic(GRP))	0.2	01.10.2016	
27	Cable trays & Ducts (Metallic)	0.2	01.10.2016	
28	Connecting Systems for Cable Repair	0.2	01.10.2016	
29	Electrical Actuators for Valves	0.2	01.10.2016	
30	Insulation Panels for Provision Rooms & Chambers	0.2	01/10/2016	
31	Pneumatic Actuators for Valves	0.2	01/10/2016	
32	Solenoid Valve Assembly	0.2	01/10/2016	
33	Stationary Lighting Fixtures /Flood Light Projectors	0.2	01/10/2016	
34	Adjustable Steel Chock	0.2	01/10/2016	
35	Circuit Breakers with Electronic Devices	0.1	01.10.2016	4
36	Contactors with Electronic Devices	0.1	01.10.2016	
37	Tachometer	0.1	01/10/2016	
38	Temperature Gauges and Transmitters	0.1	01/10/2016	
39	Thermal insulation of organic foams for piping	0.1	01/10/2016	
40	Valves for Bilge Systems	0.1	01/10/2016	
41	Valves for Freshwater Systems	0.1	01/10/2016	
42	Valves for Lubricating Oil & Hydraulic Oil Systems	0.1	01/10/2016	
43	Valves for Sanitary Systems	0.1	01.10.2016	
44	Valves for Seawater Systems	0.1	01/10/2016	
45	AC Semiconductor Controllers	0.0	01/01/2017	5
46	Control and Protective Switching Devices	0.0	01/01/2017	
47	Electronic Power Units for Valve Control	0.0	01/01/2017	
48	Electro-Pneumatic Level Transmitters (EPLT)	0.0	01/01/2017	
49	Flow Gauges/Transmitters	0.0	01/01/2017	
50	Level Gauges/Transmitters	0.0	01/01/2017	
51	Pilot Devices	0.0	01/01/2017	
52	Pressure Gauges – Transmitters	0.0	01/01/2017	
53	Soft Starters	0.0	01/01/2017	
54	Valves for Cargo systems	0.0	01/01/2017	
55	Valves for Fuel Oil systems	0.0	01/01/2017	



one class rule document versus 8 MR TRs for low-voltage switchgear

MR TR versus class rules
Disadvantage of different MR TRs

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Disadvantage of different MR TRs

- Effort to maintain the regulations is higher
- Formal differences (no technical need) will appear
- Surveyor has to be familiar with different TRs

The reduction of different MR TRs to one document will avoid effort and confusion

MR TR versus class rules
Aim

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Only one MR TS for all low-voltage devices
according the already existing class rules of the individual class societies

MR TR versus class rules

Location/Environmental Classes/Categories

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Extract from DNVGL-CG-0339:

Table 1 Location classes – selection guide

Column I		Column II				
		Main areas on board				
Parameters	Location within main area	Machinery spaces	Control room, accommodation	Bridge	Pump room, holds, rooms with no heating	Open deck
Temperature	Inside cubicles, desks, consoles, etc. with temperature rise of 5°C or more	B	B	B	D	D
	All other locations	A	A	A	C	D
Humidity	Locations where special precautions are taken to avoid condensation	A	A	A	A	A
	All other locations	B	B	B	B	B
Vibration	On machinery such as internal combustion engines, compressors, pumps, including piping on such machinery	B	–	–	B	B
	Masts	–	–	–	–	C
	All other locations	A	A	A	A	A
EMC electro-magnetic compatibility	All locations within specified main areas	A	A	B	A	B
Enclosure	Submerged application	D	–	–	D	D
	Below floor plates in engine room	C	–	–	–	–
	All other locations	B	A	A	B	C

Extract from LR Test Specification Number 1:

Table 1.1.1 Environmental Categories (ENV)

Category	Description	Ambient temperature range
ENV1	Controlled environments	to Producer's specification
ENV2	Enclosed spaces subject to temperature, humidity and vibration	+5°C to +55°C
ENV3	Enclosed spaces subject to generated heat from other equipment	+5°C to +70°C
ENV4	Mounted on reciprocating machinery	+5°C to +55°C
ENV5	Open decks	–25°C to +70°C

Table 1.1.2 Basic ENV tests

Test	Environmental Category				
	ENV1	ENV2	ENV3	ENV4	ENV5
Visual inspection	X	X	X	X	X
Performance	X	X	X	X	X
Pressure	X	X	X	X	X
Insulation resistance	X	X	X	X	X
Power supply variation	X	X	X	X	X
Power supply failure	X	X	X	X	X
Inclination	X	X	X	X	X
Vibration: Test 1	X	X	X		X
Vibration: Test 2				X	
Humidity: Test 1		X	X	X	X
Humidity: Test 2	X				
Salt mist					X
Dry heat			X		X
Low temperature	X	X	X	X	X
High voltage	X	X	X	X	X
Enclosure					X
Electromagnetic compatibility tests for equipment incorporating active electronic components	X	X	X	X	X

MR TR versus class rules

Location/Environmental Classes/Categories

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Extract from RINA Rules Part C:

For severe vibration conditions such as, e. g., on
diesel engines, air compressors, etc.:

Extract from EU RO MR TR-Draft Position Switches:

a) Reliable operation of electric and electronic part shall be ensured at relative air humidity of 100% under the following ambient temperature conditions:
- 0°C to +55°C in enclosed spaces
- 0°C to +70°C (minimum) close to combustion engines, boilers and similar; in case of components intended to be mounted on machinery associated with, or in spaces subject to, higher temperature, the relevant ambient temperature range is to be in accordance with specific machinery and installation, or with specific ambient temperature
- -25°C to +45°C on open deck (-25°C to +55°C for electronic equipment)

No damage to electrical and electronic parts shall be caused by temperature up to +70°C;

Requirements could be also in the Technical requirements/Rules itself
→ Check all the Technical requirements, like for pilot devices

MR Technical requirements versus RO rules

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