Lloyd's Register

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Lloyd's Register Type Approval System

Procedure TA14

Version 03 (July 2017)

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MARINE – TA14 version 03 – 07/17
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Report by: LR Marine & Offshore

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1. Foreword

This guide outlines the provisions for Lloyd's Register Type Approval Services and supersedes previous Lloyd's Register publications on LR Type Approval.

Lloyd's Register Type Approval Certificates for products issued under the Lloyd's Register Type Approval System, Procedures 1990, 1996 and TA02 (2002 & 2015) remain valid under the terms and conditions stated on those Certificates. Renewing such Certificates shall be subject to the provisions made in this document.

It should be noted that a Type Approved product does not remove (as required by LR Rules) the requirements for further review or for the product to be further inspected and/or surveyed to be installed in ships classed or intended to be classed with LR.

Works Approvals and approval of products under the scope of the Rules for Materials involve existing approval procedures which remain applicable.

2. Background

LR has been certifying / approving products since the last century. LR's service has evolved with experience focussing on safety, consistency and quality. The need for a systematic product certification system in the marine industry was driven by its stakeholders, ship owners along with component and equipment manufacturers demanding confidence in the supply chain. Commonly known as 'LR Type Approval System', in the early days it was focused mainly on control and electrical equipment and it was a requirement that type approved equipment should comply with LR's Rules, especially to assure the use of the product in harsher marine environment (to cope with vibrations, moisture, etc.). However, the scope of the 'LR type approval system' expanded over time to cover a vast range of products, including structural, electrical and mechanical items, and has recently incorporated welding consumables and works approvals, not just under LR Rules but also National, Regional and International regulatory requirements (e.g. MED).

The approach to approve products has evolved with experience, adapting to the ever evolving marine industry. Lloyd's Register Type Approval is available for a wide range of products with applications in:

1. Marine.
2. Offshore industry
3. Renewable energy
4. Industrial plants and processes.
5. Information technology.
6. Commercial and domestic use.

3. Main Strands of LR Certification

LR Certification

Is an impartial system representing product's conformance to the requirements of specified standard(s) and/or LR Rules, based on our examination (which includes, design review and testing of the product or testing of representative samples of the product) and verification of satisfactory control of production (when produced in quantity). For some applications the manufacturing process may need to be qualified before the products are certified, which results in a Works Approval being in place as a prerequisite for product certification.

Approval Options

While items will be approved under various regimes / categories depending on the nature of the item; it will follow one or more of the following three options (certificate type). See also Figure 1.

1. Works Approval, i.e. approval of a specific manufacturing location for producing materials (steel plate, castings, forgings, etc.) by qualification of a defined manufacturing process which comprises, as appropriate, Manufacturing Review and Type Testing;

2. Type Approval, i.e. approval of product type for items of equipment & components, systems and welding consumables which comprises, as appropriate, Design Review and Type Testing and Production Quality Assurance;
3. Product Certification, i.e. certification of produced items of Materials Components & Equipment (MC&E) of specific items (or batches) which allow items to be placed on-board LR Classed vessels, which comprises, as appropriate, Design Review, Type Testing, and Product Testing & Inspection. Depending on the product the Works Approval and/or Type Approval may or must be part of the Product Certification.

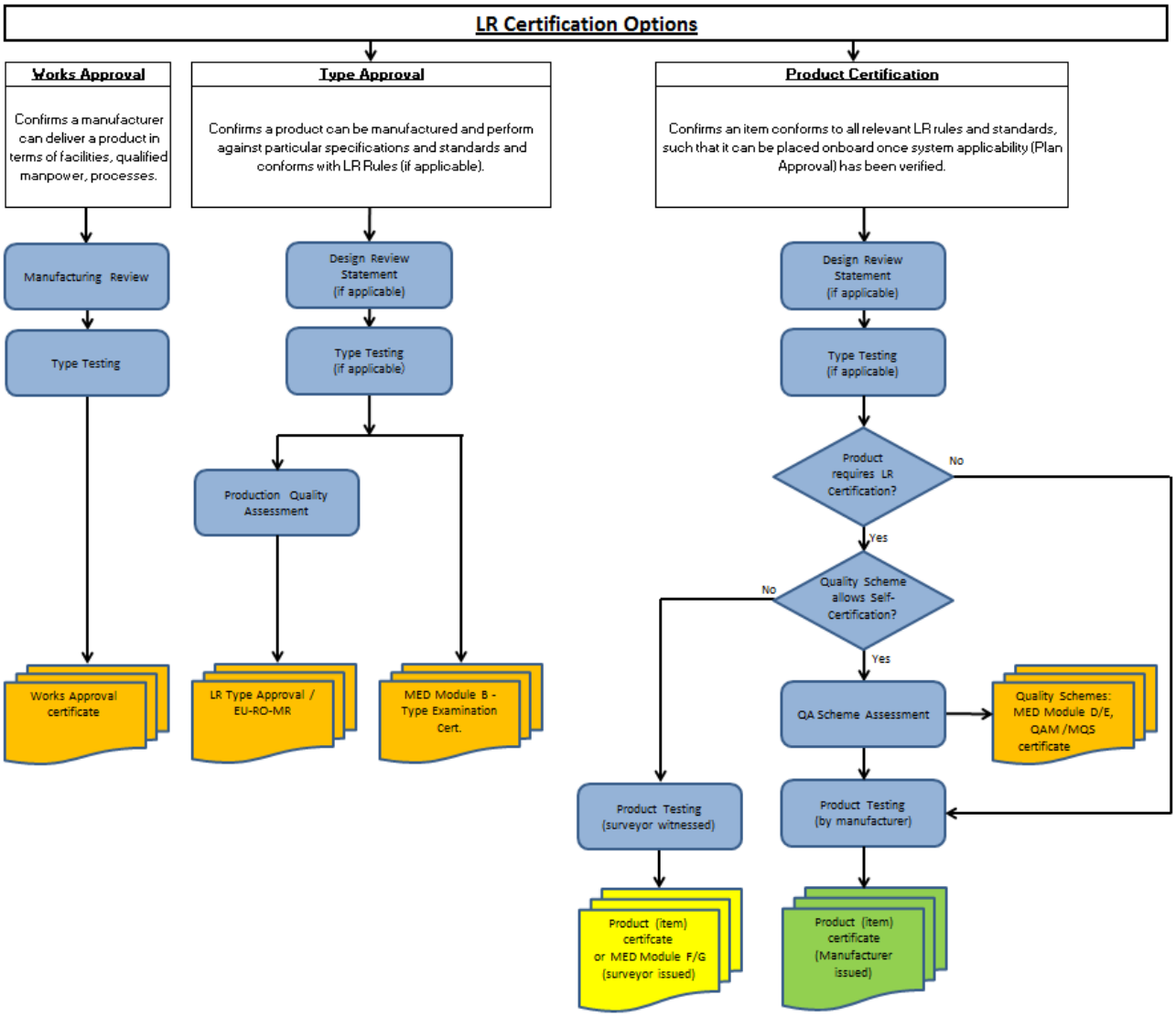

Figure 1

For Works- and Type Approval, LR has to be fully satisfied that the manufacturer has a quality assurance system in place to ensure the conformity of the products during the various production stages. The place of manufacturing shall be inspected by Lloyd's Register in order to establish the existence of adequate Quality Assurance controls for the type approved product(s). Also to ensure conformity of the product throughout the life of the certificate, the place of the manufacturing should be annually inspected. The manufacturer is responsible for implementing a production quality control system to ensure conformity of the product, including the maintenance of quality records e.g. complaints, feedback, etc.

For Product Certification, when being certified for specific application (i.e. on-board a vessel or series of vessels), Product Testing is to verify the quality of the item (or batch) and all testing and inspection required by the appropriate Rules and Regulations have been complied with.

For Works Approvals, the relevant requirements of the Rules for Materials are to be followed together with the Materials and Qualification Procedures for Ships.

The Quality Assurance Schemes (MQS & QAM) enable part or full certification of products by the manufacturer without LR witnessing product testing & inspection (Self-Certification). Detailed information can be found in the Rules and Regulations for Classification of Ships, Part 5, Chapter 1, Section 6 and Rules for Materials, Chapter 1, Section 2 and the Materials and Qualification Procedures for Ships.

4. Different categories of Type Approval

Generally the strands follow the above given sequence. However they may be carried out in a different order. For example the type testing may be done (by selecting samples from the production line) alongside when the QA Assessment is carried out. Therefore the steps will not necessarily follow the specified classical sequence in every case but can be tailored on case by case basis.

Irrespective of the type of Works- or Type Approval Certificate, the product(s) used for Type Testing need to be representative of the subsequently produced individual products. For Works Approval this also includes ensuring that the manufacturing process parameters are qualified by the products selected for testing. So a 'type approved' product produced in quantity should have the same performance and quality level when compared to an individually certified product. The approach can be adapted to accommodate different necessities of the applicant.

It is essential to remember that when LR Type Approves a product, LR confirms that the product type complies with the requirements of the stated standard(s) and/or LR Rules, which is explicitly mentioned in the certificate. The key is to review and verify, to the satisfaction of LR, that what has been specified in the certificate, and what remains to be verified during production and/or installation and identify any limitations and/or other conditions which effect its installation or performance.

One significant difference approving a product in isolation (approving the type not as part of its final configuration) compared to final situation (i.e. on-board the ship), is the interactions the product needs to function or operate; consequently any limitations to the use of a product will be stated in the approval certification.

Also LR can further add value to clients by assisting them in optimizing the required testing, especially for complex or a range of products, incorporating any client specific needs.

Depending on the product and applicant's preference, the product can be certified under various categories. Even though different terminology has been used in different categories, the overall approach remains the same for Type Approval Certification in all categories.

The four main certificates of the Type Approval categories are:-

1. Works Approval Certificate;
2. LR Type Approval Certificate;
3. MED Type Examination Certificate, Module B;
4. EU MR Type Approval certificate.

More information can be found on our website.

Works Approval Certificate

Works Approval involves qualification of a manufacturing process(es) and assessment of a company's quality assurance practices to confirm capability to manufacture products to LR Rules and/or National/International Standards, where applicable.

Before being considered for Works Approval, a company undergoes a Preliminary Review of their manufacturing capabilities by the LR local office surveyor. If this confirms their general capability then the firm submits information covering their Quality Management System, manufacturing controls, statistics of relevant products, inspection procedures, together with a test plan for the tests which are specified for the particular product(s) they are seeking approval.

Following LR's review and agreement with the test plan the company commences the approval testing under survey and submit the results to LR for review and approval. If the results are found to be satisfactory a certificate of approval is issued to the company by LR.

The approval certificate specifies the manufacturing process(es) approved and the scope of products approved, which may include limitations on, for example, dimensions, product weight, etc. Works Approval certificates are valid for three years and are only applicable to the manufacturing location stated on the certificate.

Following approval, the surveyor will make regular visits to check the manufacturing process controls remain effective (this may be at the same time as product surveys), this is in addition to witnessing batch / piece testing for product certification. A triennial assessment of the works is required after a duration not exceeding three years.

Procedures for Works Approval can be found on Class Direct under Materials and Qualification Procedures for Ships.

LR Type Approval Certificate

This category is the approval against requirements of agreed standard(s) and/or LR Rules.

In LR Rules, there are some products for which LR requires the Type Approval process to have been followed and a Works- or Type Approval Certificate issued before they can be accepted for use on LR classed ships. However it should be noted that LR Type Approval does not remove the requirements for;

- Inspection and survey procedures required by the LR Rules for Materials, Components & Equipment (MC&E) intended for ships classed with LR or,
- for plan appraisal of a system that incorporates Type Approved MC&E as required by the LR Rules; [note: notwithstanding this requirement, for any products which are covered by the LR Rules, the relevant Class requirements should also be considered as part of the scope of the design review during the Type Approval process];

Additionally LR has produced performance and environmental test specifications which define the minimum requirements to be followed for products including electrical equipment, piping system components, diesel engines and gas turbines. The test specifications are made freely available to third parties through the Lloyd's Register website.

LR may also issue certification to a manufacturer who wishes their products to meet the requirements of a National Standard (e.g. flag administration standard), for example LR has been authorised by the Maritime & Coastguard Agency (MCA) and Transport Canada to issue certificates on their behalf in accordance with the relevant flag state requirements.

The manufacturer may wish to have his product type approved against some other standard (e.g. manufacturer's own standard). However for any such requests to be considered, an initial decision needs to be made that (a) the standard is appropriate and (b) LR has applicable expertise to undertake review against the standard(s) against which the Type Approval process will be applied and (c) the required resources are available in the timeframe required by the manufacturer.

Marine Equipment Directive (MED)

This covers defined equipment, required under International Conventions, carried and used on ships registered under the flag of a European Union member state. The products and the applicable standards are explicitly listed in the directive and mainly applicable to European Flagged ships, irrespective of where they are built.

The MED scheme defines conformity routes from which the manufacturer may choose the most appropriate option in consultation with LR. See Figure 2.

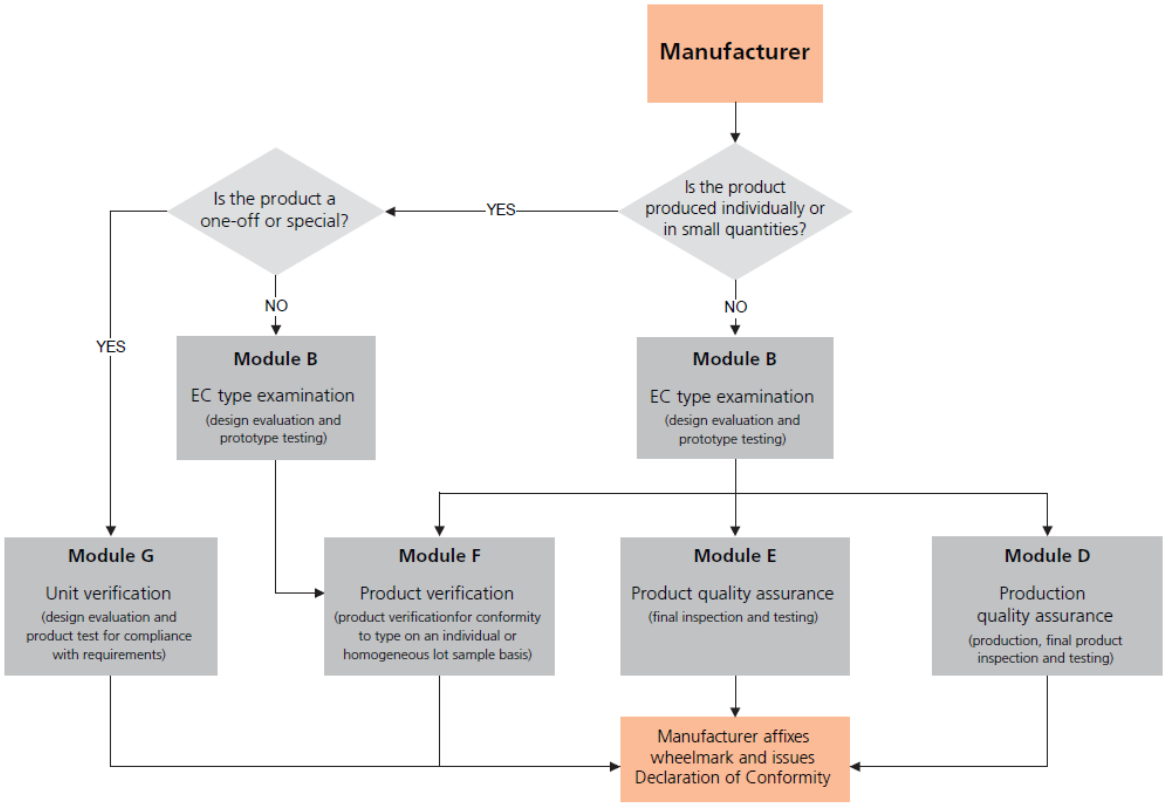

Figure 2

An equivalent scheme is operated by the US Coastguard and an agreement has been made between the United States and the European Union to create an EC-US Mutual Recognition Agreement (MRA) on defined marine equipment upon which a common set of requirements is applied.

Further information for MED is available on our website .

Mutual Recognition of Type Approval Certificates

The EU RO Mutual Recognition scheme covers type approval certification on selected components and equipment for which mutually agreed technical requirements have been developed and agreed by all European Union (EU) Recognised Organisations (ROs).

Each EU RO is obliged to accept Mutual Recognition type approval certificates issued by any one of the other EU ROs when such certificates relate to one of the products on the agreed list (e.g. Tier 1, Tier 2,Tier 3,Tier 4, Tier 5 and subsequent Tiers will follow) and for which the class society classing the ship has a requirement. Further information is available on the EU RO Mutual Recognition Group .

5. The Type Approval Process

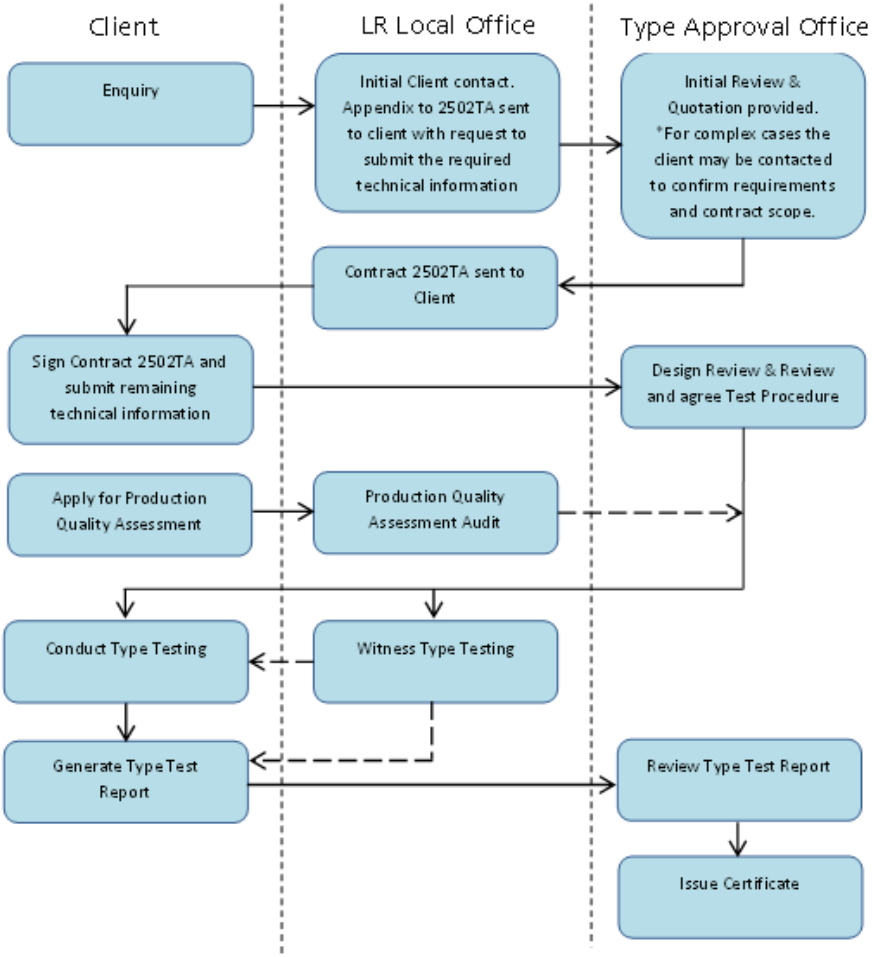

Figure 3

General

The process described in this Section follows the normal procedures for Type Approval. For MED and Mutual Recognition Type Approval certificates the process will follow in general the same lines but typical requirements imposed by the EU must be complied with. The procedures for the Approval of a Works and Approval of Welding Consumables and other materials under the scope of the Rules for Materials, which can be found in the *Materials and Qualification Procedures for Ships*, must be followed.

Enquiry and Initial Review with Client contact

The application should either be made to the Type Approval Office or to the LR Local Office, by the manufacturer or from manufacturers producing under licence. The LR Local Office should dispatch the Appendix to 2502TA to the client. When returned to the LR Local Office if the manufacturer is producing under licence this shall be accompanied by a written statement from the licensor confirming that there is no objection to the licensee making the application and shall state the manufacturer's name responsible for the application. Where the licensor already holds Lloyd's Register Type Approval certification for the product, details should be included with the application. The application together with the documents submitted must contain sufficient information to allow the product to be assessed against the design criteria. Typical documentation is listed below:

1. Product specification.
2. Relevant design / assembly drawings with materials specified, catalogues / brochures, data sheets, calculations, functional descriptions and parts lists where necessary.
3. Proposed field of application and operational limitations.

4. Proposed test programme to demonstrate that the performance provisions of the specified standard(s) may be fulfilled.
5. Certificates and reports for relevant tests obtained for the product.

Type Approval cases, after being received in the Type Approval Office, will be assigned to a 'designated co-ordinator' who shall:

- Coordinate all of the contributing stakeholders, ensuring work is completed in a timely manner;
- Assist and guide the client through the process;
- Provide technical support to the client and LR Local Office if requested.

The initial review will cover the following:-

1. Check if the Type Approval is possible and that the Type Approval is not prohibited by Rules, International Conventions or Standards;
2. Check additional technical documentation to be submitted;
3. Check if proposed test standards are acceptable.

Upon completion of our initial review by the TA office the client may be contacted to discuss essential details required for the Type Approval process and to finalise application details. The main intention of this LR-Client contact is to discuss the intended application in relation to the proposed standards and the technical details of the product(s) such as rating and product ranges. Besides that LR will help with the application process by explaining the approval process and the additional documentation that is required to be submitted, along with advising the type test requirements and proposed standards. If the proposed standards are not suitable for use on-board of a ship classed by LR more appropriate standards or equivalents may be discussed.

For applications other than in a Marine environment the required standards may depend on project- and/or National requirements. The coverage of the Lloyd's Register Type Approval Certificate will be limited to the relevant scope of the Specified Standards and acceptance thereof by the local authorities.

Design Review and review of Test Procedure

In this step the evaluation of a design of the product to determine compliance with the agreed technical requirements and review of the test proposal (if submitted) will be completed. The review of the test proposals is to confirm that testing will adequately demonstrate compliance of the products(s) with the relevant standards. Any comments or recommendations on these tests will be advised.

The comments or recommendations resulting from the Design Review will be advised together with the preliminary conditions and/or limitations that will be applicable to the Type Approval certificate.

For the acceptance of a product on-board of a ship classed by LR it is mandatory that the LR Rules are complied with as applicable. During the Design Review the design will also be assessed against the applicable Rules unless the LR rules have been explicitly excluded from the intended application.

Type Testing

General: Testing is to verify that the material, equipment or component meets the specified requirements from the standard(s).

The type testing shall be undertaken at an (accredited) laboratory or at the manufacturer's premises where authorised by LR.

A design analysis may be used to assess performance where:

1. Evidence exists, in the form of performance measurements from similar products, to substantiate the findings of the analysis.
2. The analysis method is recognised by Lloyd's Register and well established.
3. It is mutually agreed that type tests cannot be performed or are inappropriate.

Selection: Samples for inspection and testing should be selected in accordance with the standard(s) and be representative of the entire range of products to be certified. In case the test standard(s) does not indicate any requirements for the selection of samples for a range of products, the selection need to be agreed with between client and LR. Samples are to be selected at random and where possible, should cover a series of production batches. The samples must be positively identified so as to indicate any tampering. Samples that have been tampered with should be replaced and the tests repeated. The manufacturer should provide a statement defining how the samples are selected to be representative of the product. The samples should be produced using the same methods and tools established for the production run, except where the sample is a prototype. Where inspection and testing are based on prototype samples, LR reserves the right to repeat the inspection and testing, as appropriate, on production samples.

Test Report: On completion of the tests a report shall be issued by the client or testing facilities. The report is to be identified by number and date which accurately and unambiguously presents the test results and all other relevant information. As applicable, the content of test report(s) should include the following information as a minimum:-

- Type of products with type number/serial number(s) and quantity tested;
- Test Specification for the product identified by number, revision and date;
- Information required by the test standard;
- Details of the test equipment and measuring instruments stating serial numbers and calibration certificates;
- Names of the test engineer and the engineer approving the report;
- Ambient environmental conditions during the test;
- The test results with a description of any failures encountered;
- Conclusion;
- The test report(s) should be signed by test personnel and verified by the LR surveyor or the agreed independent representative witnessing the test;
- The complete product test report(s) shall be submitted in one package to LR.

The comments or recommendations resulting from the review of the test report(s) will be advised and where necessary the client will be invited to consider (or act on) it accordingly.

Depending on the complexity and product type a review of the Type Approval certificate, prior to issue, may be beneficial. Upon request LR will forward a draft version of the Type Approval certificate.

The draft version of the certificate enables the client to agree with the details of the Type Approval certificate, such as application, product- and type designation, ratings and the mentioned conditions

Production Quality Assurance

Initial Assessment: The initial assessment of the Production Quality Assurance system is to ensure that the product(s) can be consistently produced in accordance with the Type Approval Certificate(s) for the product(s) concerned.

The application for assessment of the Production Quality Assurance system must include the following:

1. Relevant information for the product(s) envisaged;
2. Name & address the place(s) of production other than the TA applicant site;
3. Documentation of the quality management system including the quality management system certificate.

The assessment procedure will include a visit to the client and other place(s) of production and a review of the quality management system documentation available in these locations.

Other places of production need a visit when:-

1. The entire product may be manufactured in other locations;
2. Key components are not handled through the client's Quality Assurance system with respect to the inspection and testing of incoming components and materials.

The objectives of the initial assessment are to:

1. Verify that information provided on the products, facilities and procedures is correct.
2. Verify that the quality management system is being maintained and audited to the requirements of ISO 9001 or industry-specific equivalent standard.
3. Verify that the manufacture of products and implementation of controls are performed in accordance with the quality management system. Audits will focus on technical aspects of product realisation and determine whether process variables are adequately controlled.
4. Verify product quality and performance characteristics by auditing manufacturer's records on non-conforming products and processes, warranty data and client complaints.
5. Verify arrangements for acceptance and certification of purchased materials, components and equipment and services at the manufacturer's works.

A report of the audit assessment is provided to the client for each place of production.

Periodical Assessment: The manufacturer is to apply for periodical assessment to verify that the quality system Production Quality Assurance scheme is maintained and applied. The periodical assessment will be required 30 months ± 3 months after issue of the Type Approval certificate or at renewal of the Type Approval certificate whichever comes first. The periodical assessment may be harmonised with other surveys and/or audits carried out by Lloyd's Register for the relevant products and production facilities.

The objectives of the periodical assessment are:-

1. Verify that the production and quality system(s) continue to ensure that the product(s) can be consistently produced in accordance with the Type Approval Certificate(s) for the product(s) concerned;
2. Verify that the design, the material and the performance of the product have not been changed;
3. Review records on non-conforming products and processes, warranty data and client complaints.

A report of the audit assessment is provided to the client for each place of production.

Periodical Assessment for EU MR type Approval certificates: The manufacturer is to apply for periodical assessment to the EU RO at an annual frequency to verify that the quality system Production Quality Assurance scheme is maintained and applied in accordance with the EU RO Framework Document for the Mutual Recognition of Type Approval.

The manufacturer must allow access for inspection purposes to the locations of manufacture, inspection and testing and storage and must provide it with all necessary information, in particular:

1. the Production Quality Assurance scheme documentation and the design evaluation documentation;
2. the quality records, such as inspection reports and test data, calibration data, damage and claims records, qualification reports of the personnel concerned, etc.;
3. additional testing as per the Technical Requirements may be required by the EU

A report of the audit assessment is provided to the client for each place of production.

6. Certificate

For MED and EU RO MR Certificates, the established format must be used, but apart from these externally determined certificate formats, a LR Type Approval certificate should contain the following information:-

- *Name and address of the producer;*
- *Description of product;*
- *Product designation;*
- *Product Type;*
- *Application;*
- *Specified standard(s) against which the product conforms to (including the appropriate Rules);*
- *Ratings (if applicable);*
- *Additional environmental tests (if applicable)*
- *Limitations or other conditions, including if applicable:-*
  - *If the product will not be examined against LR rules (even when the rules are available) it will be specified that within the scope of the Type Approval certificate Marine applications are excluded;*
  - *Any limitations and/or conditions applicable for the product.*
- *Place(s) of production (other than the Producer's site);*
- *Certificate number;*
- *Date of issue;*
- *Date of expiry;*

All certificates must include the following comments in the section for Limitations or other conditions:-

- *Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.*
- *If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.*
- *(In case of applications other than Marine) The application of this Type Approval Certificate will be limited to the relevant scope of the Specified Standards and acceptance thereof by the local authorities.*

The certificate will be issued for a period of maximum five years from the date of issue.

Renewal Certificates

Application should be submitted to LR Local Office at least six months prior to the existing certificate expiry date. No additional documentation is required if the product (including range and ratings), place of production and specified standards are unchanged. If any of these aspects will be changed prior to the expiry date, as required by the LR terms and conditions, LR must be informed. Depending on the changes made, the same process may need to be followed as for the original certificate.

Cancellation or Withdrawal of Certificates

LR reserves the right to cancel a Type Approval Certificate if:

- Any design and /or construction changes are made to a certified product which is deemed to adversely affect the descriptive or performance provisions under which LR Type Approval was granted.
- Safety or any other feature of a certified product is found to be unsatisfactory in service.
- Improper use is made of the Certificate, or the LR Approval Mark, or of LR's name, in marketing the product.
- Settlement of fees for LR's services associated with the Type Approval certification is not completed.
- The client changes any of the addresses stipulated on the Certificate, without informing LR.
- Periodical Quality Assurance audits have not taken place.

LR will withdraw a Certificate if:

- The client does not wish to renew the certification.
- The product is no longer produced.
- The specific relationship between a manufacturer producing a product under licence and the licensor no longer applies.

If LR considers that a Type Approval certificate should be cancelled or withdrawn, the client will be informed in writing and given the opportunity to take appropriate corrective action, or give notice of appeal.

LR reserves the right to publish details of cancelled or withdrawn certificates, together with reasons, if considered necessary.

7. Manufacturer's Responsibility

It is the manufacturer's responsibility to ensure that each product is supplied is in strict conformity with the corresponding Lloyd's Register Certificate;

The manufacturer shall only make reference to Lloyd's Register Type Approval, the Lloyd's Register Type Approval Mark, or Lloyd's Register's name in advertising or otherwise, for products that have been certified by Lloyd's Register.

The manufacturer must not mislead purchasers by claiming performance not covered by the certification.

The manufacturer shall maintain a record of all complaints and any remedial action relative to each product certified. Such records must be available for Lloyd's Register's review on request.

8. Declaration

Lloyd's Register undertakes to ensure that current issues of the Lloyd's Register Type Approval System Procedure and other appropriate documentation are available to all its representatives, located in exclusive and non-exclusive offices worldwide.

Lloyd's Register undertakes to maintain records of relevant documentation, such as design drawings and test reports, for the duration of the Type Approval (i.e. while certification remains valid).

Lloyd's Register undertakes to protect the confidentiality of information received in the course of its services.

Lloyd's Register's affairs are under the overall direction of Lloyd's Register's General Committee, which is composed of persons nominated or elected to represent the world community and the industry which Lloyd's Register serves.

Any appeal to Lloyd's Register from decisions or recommendations made with respect to Lloyd's Register Type Approval may be referred to Lloyd's Register's General Committee, who may direct a special examination to be held.

The interpretation of these procedures is the sole responsibility, and the sole discretion, of Lloyd's Register.

9. Use of the LR Approval Marks

When a LR Type Approval- or Works Approval certificate has been issued and whilst it remains valid, the manufacturer is authorised to use a LR Approval Mark under the terms and conditions agreed at the time of approval. This mark may be used by the manufacturer on any packaging for the product, promotional material or to the product itself.

Upon request, the Mark is made available by LR in electronic format in accordance with the Corporate Identity Guidelines.

10. Definitions

Assessment	Process of evaluating a design, product service or process and judging the specified standards;
Certification	a procedure whereby a design, product, service or process is assessed for compliance with agreed technical requirements;
Conformity	The fulfilment by a product, or group of products, of all requirements specified;
Design Analysis	A method of proven reliability to assess that safety and/or performance provisions of a specified standard are fulfilled;
Design Review	Review of a design of a type of the product to determine compliance with the agreed technical requirements;
International Conventions	IMO Publications and Documents, e.g. SOLAS, MARPOL, MSC, etc;
LR	Lloyd's Register Group including all its members;
LR Rules	Lloyd's Register Rules, including those for Naval Ships, Inland Waterway vessels and Special Service Craft;
Manufacturer	a company producing and/or assembling final products and is responsible for such products;
MC&E	Materials, Components & Equipment;
MED	EU Council Directive 2014/90/EU – Marine Equipment Directive;
MQS	Material Quality Scheme;
QAM	Quality Assurance Scheme for Machinery;
RfS	Request for Marine Services Form 2502TA / 2502 TA MR;
Standard	- National standard, e.g. British Standards, German Standards; - International standard, e.g. ISO, IEC; - Any other type of specific requirements, e.g. flag administration requirements or Manufacturer's Standards;
Type Approval Certificate	A document indicating that adequate confidence is provided that a product, or group of products, is in conformity with the specified LR Rules and/or standard(s);
Type Testing	A method under which a sample of a product or group of products is tested in order to assess the performance of a specified standard, either directly or by simulation of the influencing conditions that may occur in service;
Witness	to be physically present at a test in accordance with the agreed technical requirements and be able to give evidence about its outcome;

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