

QRS-105 Management of Leonardo Helicopters Equipments and Tools



 **LEONARDO**
HELICOPTERS

QRS-105

Management of Leonardo Helicopters Equipments and Tools

Issue Date: June 2018 Issue: 00

CHANGES LOG

Issue	Approval Date	Main changes	Interested Paragraphs
00	June 2018	First Issue	All

APPLICABLE DOCUMENTS

This document *shall* be applied together with the main document (QRS-01 Quality Requirements for Suppliers) and with the other applicable modules

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1 Purpose

The purpose of this procedure is to provide requirements to be complied by the Suppliers of equipment or tools required by a Leonardo Helicopters drawing/specification.

Such equipment and tools can be provided to the Suppliers by Leonardo Helicopters on loan or manufactured by the Supplier on behalf of Leonardo Helicopters.

Requirements detailed in this procedure are related to Quality aspects.

Additional requirements (such as type, endurance, performance, periodical checks) can be specified in the orders/contracts/drawings and/or associated documents.

2 Applicability

This procedure applies to all those equipment/tools that are subject to initial checks, periodical and on condition checks, during their lifetime, such as:

- Machining equipment/tools
- Manufacturing and control equipment/tools
- Jigs and yards
- Software and numerical control programs, or testing machines
- Masters
- Test benches

3 Effective date

Issue date

4 Acronyms, definitions and abbreviations

4.1 Acronyms and abbreviations

LH Leonardo Helicopters

4.2 Definitions

Counter-master: Equipment ensuring masters and tools interchangeability.

Equipment Machine: tools, hand tools, inspections tools used to manufacture and/or check articles and assemblies in conformity with the drawings.

Inspection Tools: Tools used to provide geometrical references to facilitate the check the conformity of articles in compliance with the applicable technical documentation.

Jig/Yard: Working equipment used to assemble and to check the components that constitute a set.

Machining Tools: Tools used to provide geometrical references to facilitate the manufacture of articles in compliance with the applicable drawings.

Manufacture and Control Tools: Tools that fully comply with the requirements of manufacture and check of the items.

Master: Equipment not intended for production use, but used as references for shapes and dimensions during the manufacture of machining and tools and series of tools in order to ensure interchangeability.

Test Benches (static, dynamic and functional test): Equipment used to test the functionality and performance of articles and assemblies.

5 Requirements

5.1 Leonardo Helicopters equipment received by Suppliers on loan

Suppliers *shall* perform incoming inspections on Leonardo Helicopters equipment provided on loan.

All the defects discovered that can prevent the use of the equipment *shall* be notified to LH and *shall* be segregated waiting for disposal by LH.

The Supplier *shall* highlight the receipt of the equipment/tool through the application of the control stamp on the incoming document. Upon acceptance of an equipment/tool, the Supplier becomes responsible for it from the physical condition, qualitative, maintenance and management points of view.

Suppliers *shall* take full responsibility for the conformity of articles produced by the loaned tooling.

5.2 Equipment/tools manufactured by the Supplier on behalf of LH

The sequence of activities required for an equipment/tool consists of:

- Check of manufacturing and control documents for the new equipment/tool (provided by LH or developed by the Supplier, in accordance with the contract).
- Manufacture of the equipment/tool
- Control and initial qualification of the equipment/tool (by the Supplier and/or LH)
- Use of the equipment/tool
- Periodical and extraordinary checks.

Every new equipment/tool, even if manufactured to replace or to duplicate an existing one, *shall* be qualified prior to be used.

Equipment/Tools *shall* be manufactured by an LH approved tooling supplier, or manufactured by the approved supplier of the production article.

5.3 Design of equipment/tools

The detail drawing *shall* be developed by the Supplier in compliance with the technical specification/drawing or any other document (such as operative instruction linked to a specific traveller item) provided by LH.

Consideration *should* be given to tool design to allow manufacture according the anticipated production rate. Consideration *should* be given to tool durability according to anticipated production lifetime.

The detail drawing *shall* list, at least, the following information:

- Identification method
- Identification ([ref. paragraph 5.3.1](#))
- Area where identification *shall* be indicated
- If periodical checks are required and which characteristics are subject to periodical checks ([ref. paragraph 5.7](#))
- If final check is required
- If coordination is required (mandatory for jigs)

Note: coordination is required to grant equipment/tools or assemblies that interface with other ones (manufactured with other tools) to be assembled each other's.

- If preservation is required

In case of equipment/tool made by several parts, design activities *shall*:

- Reduce moving parts
- Grant the physical identification of all the loose parts,
 - In case physical identification is not possible, physical constraints among loose parts are required (or specific boxes to group them in case constraints are not possible).
 - If the above situations cannot be put in place, the drawing leads
- For equipment/tools funded by LH, the designer/supplier *shall* acknowledge and register to LH that tooling and designs are owned by LH.

5.3.1 Identification

Identification of the equipment/tool *shall* be granted by the application of a metal plate on the equipment/tool itself (if allowed by the dimensions), except for these cases:

- Equipment/tool dimensions are not sufficient
- The plate can be damaged

- The plate can cause injuries to operators or can have an impact on the operative functionality of the equipment/tool itself
- The plate can have an impact on the activity

In these cases identification can be done through alternative methods such through the application of a permanent marking, self-adhesive label, etc.

Metal plate *shall* include at least the following informations:

- Part Number
- Serial Number (if applicable)
- Drawing issue
- Final acceptance evidence (if physical marking is not possible, alternative methods can be agreed with LH)
- Periodical check evidence
- Weight (if more than 15 kg – for equipment/tool with several parts, refer to the total weight)

All the other information *shall* be recorded on the equipment box.

In case the equipment/tool is composed by several parts, the link between each part and the final equipment/tool *shall* always be granted (drawing part list of the equipment/tool *shall* list all the parts, including standard parts).

5.4 Initial Qualification

The initial qualification of a new equipment/tool required the following actions:

- Check the equipment/tool conformity to drawings and manufacturing documentation
- Check that the equipment/tool is properly identified (metal plate or alternative approved methods in accordance with paragraph 5.3.1)
- Check the conformity of the article manufactured with the new equipment/tool
- Definition of the need of periodical checks, periodical checks and expiration date
- Compilation of the relevant cards of the equipment/tool and relevant identification in the equipment/tool register

Qualification steps *shall* be documented by the supplier that, at the end of the qualification process, *shall* put a conformity stamp on the documentation and on the equipment/tool.

LH takes right to participate to the qualification phases, to perform acceptance activities and to plan any audit during significant phases of the manufacturing process.

5.5 Equipment/tool validation

Equipment validation is part of the manufacturing process validation.

In case a First Article Inspection is requested, it *shall* be performed in accordance with QRS-101.

In case FAI is not requested, the final acceptance of the articles implies the validation of the equipment/tool.

A negative FAI (which failure is related to the equipment), *shall* require a Quality Notice and subsequent corrective actions.

5.6 Register and identification cards

Any equipment/tool used to manufacture LH articles *shall* be part of a register that contains the references to identification, location and (if applicable), the periodical checks to be performed and expiring date, as well as any change from the initial configuration.

Significant equipment/tools (such as assembling jigs, control and working equipment/tool, masters, test benches or special equipment/tools for single articles) *shall* have their own cards with the identification references, reference to the articles they can be used for, initial qualification, periodical checks (in terms of timescale and/or number of manufactured articles), expiring date and type of control to be repeated for the re-qualification after modification/repair.

For equipment/tools owned by LH, registers *shall* show that tooling and designs are owned by LH.

For equipment/tools owned by LH, the supplier *shall* transfer tools with LH written permission and any such transfer *will* be documented and recorded.

On request, for equipment/tools owned by LH, the supplier *shall* supply a copy of the register.

5.7 Periodical checks

Equipment/tools *shall* be subject to periodical inspections, executed by a qualified Inspector, to verify their status: the results of these inspections *shall* be recorded.

A Periodical Check can be expected based on the following factors:

- Precision requirements of the tool
- Complexity of the tool
- Frequency of use of the tool
- Type of tool
- Costs of periodical checks and potential non-compliance

The periodicity of periodical checks, if applicable, may be based on a time period measured in months or on the quantity of manufactured articles. The “calendar criterion” is based on the likelihood of environmental deterioration; the “quantity criterion” is based on the wear caused by the workmanship.

The re-check is mandatory upon modification, repair, overhaul or following to equipment/tool removal fixed on ground, with consequent coordination in case the modification had an impact on the coupling articles (such as profiles, drilling, etc.).

The evidence of the periodical checks *shall* be provided:

- On the card through stamp, signature and date.
- On the metal plate or on the container according to the equipment dimension.

The documentation issued or received together with the equipment/tool *shall* be kept updated.

Note: in case of equipment/tool modification, the new expiration date of the periodical checks shall be calculated from the final acceptance date related to the modification.

Equipment/Tools, that are used for acceptance of articles, *shall* be controlled as a calibrated article.

5.8 Equipment coordination

Equipment coordination, performed through the master, is necessary to avoid that articles interface with other articles manufactured with separate equipment, result not fitting each other.

Coordination *shall* be performed, if applicable, every time that one of these conditions occurs:

- Before final acceptance of the equipment/tool
- Upon modification/repair of the equipment, when this modification has affected interchangeability / coupling of produced items /assemblies
- Upon equipment/tool movement
- During periodical checks

Regarding the performance of coordination during the re-qualification after modification, repair or overhaul, it *shall* be performed in those cases in which modifications have affected even only one of the two articles (e.g. profiles, drillings, etc.)

The evidence of the coordination check performance *shall* be recorded on the documents relevant to all the involved equipment.

For equipment/tools owned by LH, the supplier *shall* only modify tools with LH tool design authority written permission and any such action *will* be documented and recorded.

5.9 Interchangeability

Full interchangeability is a requirement for each component or assembly classified as spare part or replaceable part and it is achieved when both geometrical and functional requirements are satisfied.

Equipment manufactured and procured by the Supplier for components on which interchangeability characteristics *shall* be checked and assured, *shall* be manufactured, qualified and therefore maintained according to a standard which allows tolerances for the involved characteristics and their next assemblies.

5.10 Equipment/tool usage

The Supplier operator *shall*:

- Before to use the equipment/tool verify the physical conditions
- Before to use the equipment/tool verify the initial validation
- Before to use the equipment/tool verify the performance of periodical checks, where applicable
- Store the equipment/tool and relevant documents in a suitable location to grant their efficacy
- Perform and validate preservation of the equipment/tool
- If applicable, ask for the performance of periodical checks
- Ask for the coordination after the movement of equipment/tool
- If applicable, ask for modification or repair of the equipment/tool

5.11 Subcontracted activities

The supplier *shall* ensure that its subcontractors work in accordance with the requirement of this procedure, further to the orders/contracts in place with LH.

Suppliers are not authorized to subcontract any activity without formal approval by LH and any authorized transfer *shall* be recorded.

5.12 Equipment storage

Equipment *shall* be stored in a suitable place, in efficient state and properly preserved with the record on the control documentation of the preservation performed and date of performance.

Storage in open air is not allowed.

The equipment *shall* be used exclusively in relation with the activities required by LH orders/contracts.

5.13 Packing and Shipment

It is supplier responsibility to deliver equipment to LH with proper preservation, packing and shipment, together with suitable identifying and conformity documentation according to the applicable specifications or the order/contract requirement.

In any case the equipment *shall* be protected against corrosion, contamination and damages.

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Masters *shall* be provided with dedicated packing and containers.

5.14 Delivery Documentation

The manufactured equipment/tool, *shall* be delivered with the dedicated Certificate of Conformance, dimensional report, functional tests, calculation reports, management handbook, assembly instructions, warnings and limitations, manufacturing documentation.