Quality assurance and quality documentation for stationary plant components

MAN Energy Solutions

Table of Contents

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Change history

Edition	Department	Author	Changes
1.0	PSQO	Theresia Büschl	Transfer of the previous quality guideline and revision of contents

Review history

Edition	Department	Review by	Review issues
1.0	PSQO	Thomas Lauchner	Check of contents
1.0	PSQO	Erika Ott	Check of contents

Approval history

Edition	Department	Approver
1.0	PSQ	Dr. Peter Wilk

Former Number

Q10.09028-2101

Quality assurance and quality documentation for stationary plant components

1 Purpose

MAN Energy Solutions SE (MAN ES) orders the required scope of quality documentation for selected components. This scope can be ordered, among other things, as an additional order item subordinate to the component using the MAN ES material number 61.60000-0001. This instruction specifies the contents of the material number 61.60000-0001 in more detail.

The responsibilities relating to the components as well as the procedure with regard to quality assurance are usually defined in quality requirements between the customer (MAN ES) and the contractor (contractual partner).

Responsible for the content of the instruction: Head of Quality HSSE Product Line EPC, MAN Energy Solutions SE, Augsburg.

2 Scope

This instruction is an integral part of the order.

Specifications that the client makes to the contractor in the order for components or services shall apply additionally or shall take precedence. The liability of the contractor arising from warranties and claims for damages due to defective deliveries or services is not affected by this quality guideline. This guideline defines the technical and organizational framework and processes of the business partners in order to achieve the common quality goal of "zero defects". If the contractor does not comply with these requirements and the client suffers a disadvantage as a result, the contractor is obliged to pay compensation.

If the scope of the contract covers construction services, I2132 "Quality and HSSE requirements for construction services in plant engineering" shall apply.

This instruction applies to:

- Contractors of plant components
- Providers of benefits and services
- MAN Energy Solutions SE

This instruction does not apply to:

- Works
- Engine parts
- Turbocharger parts
- Parts for propellers made of MAN ES in-house production

This instruction is valid for all employees of companies and organizational units mentioned below, and is binding for all employees which are affected by this instruction within the scope of their duties. The superior has to ensure that the employees know and observe the determinations of this instruction.

Valid for the following company(ies): MAN Energy Solutions SE

Valid for the following organizational unit(s): PL Components; PL EPC; Sales & PrimeServ

Valid for the following location(s): All Locations

Valid for the following department(s): PSB; PSQ; SP

3 Terms and definitions

Term	Definition
Client	MAN Energy Solutions SE
Contractor	Supplier or service provider who provides a contractually guaranteed (service) service for the client
Contracting party	Supplier or service provider who provides a contractually guaranteed (service) service for the client
EU	European Union
Plant quality	Quality management area, which is assigned to the EPC product line and in this context takes on tasks for various areas of the company, in particular qualification and monitoring of contractual partners who provide plant components.
QM system	Quality Management System
FAT	Factory Acceptance Test
SAT	Site Acceptance Test
ITP	Inspection and test plans
QCP	Quality Control Plans
PSI	Pre-Shipment Inspection
MAN ES	MAN Energy Solutions SE

4 Content-related regulations

4.1 Producer responsibility

If the contracted scope of services and deliveries from the order is not based on any development, construction or design of MAN ES, production shall be carried out within the framework of an assignment of the contractor under its manufacturer's responsibility for the contracted scope. As a rule, the scope of delivery or services of the contractor consists of a number of components that are arranged in such a way that they function as a whole (corresponds to modular design) or one trade.

4.2 Quality system of the contractor

The contractor shall demonstrate a quality management system in accordance with the requirements of ISO 9001. If the contractor does not have ISO 9001 certification, he can alternatively prove to the client (MAN ES, plant quality) by means of suitable documents that he has a suitable quality management system. The client (MAN ES, Plant Quality) will then check the suitability and, if this is fulfilled, release the contractor. The products and services must be state-of-the-art. All manufacturing tasks (e.g. design, construction, procurement, assembly work, manufacturing, testing, etc.) are carried out in accordance with the requirements of ISO 9001. The client is entitled to determine by means of an audit whether the quality assurance measures of the contractual partner meet the requirements of the client.

4.3 Standards and Guidelines

The products, services and trades must comply with the current international (technical) standards, guidelines and norms. If order-specific national standards, guidelines, laws in the respective country of the end user are to be observed, these are listed in the order/specifications. The contractor shall prove conformity with these requirements in an appropriate form, see also additional document for explanations in section 5.6 Quality Documentation (order-specific). If special approvals are required for the execution of the order/contract and their maintenance (see order/specifications), the contractor is responsible for this. He will only accept the order if he has the necessary approvals and certifications and can prove this with appropriate documents. Proof of compliance with these requirements shall be handed over to the client at the client's request.

By accepting the order/contract, the contractor also undertakes to comply with the requirements of the Act on Corporate Due Diligence Obligations in Supply Chains.

4.3.1 EU laws and directives

The contractor ensures that all EU directives applicable to its product or service are complied with.

Preference shall be given to harmonized standards. He assumes the manufacturer's responsibility for his product or service, carries out the conformity assessment, prepares and hands over to the client an operating manual / assembly instruction with identification of the residual hazards. The associated risk assessments / risk analyses can be viewed by the client at the contractor. It confirms conformity or compliance with the EU directives by means of the documents required by law in the EU. In addition, he shall hand over to the client all individual documents/calculations and construction documents, test protocols and approvals, which he requires/prepares in connection with the proof of conformity. If acceptance by Notified Body (3rd party) is required for his product or services, the contractor shall ensure acceptance and hand over the protocols to the client. His performance shall only be deemed to have been fulfilled if the client has all documents complete and correct.

4.3.2 Special arrangement for power plants and installations located outside the EU

The contractor assumes the manufacturer's responsibility for his product or his contractually agreed service. The country of end-use shall be given to him when the order is placed. In any case, he prepares and hands over to the client an operating manual / assembly instruction with identification of the residual hazards. The associated risk assessments / risk analyses can be viewed by the client at the contractor. These must comply with the minimum standard of the requirements of the EU Machinery Regulation or EU Machinery Directive in the current version or, if this is not applicable to the product, the corresponding directives in the target country. If further documents, tests, proofs or the application of special standards for its product are required in the country of end use, the contractor shall hand them over to the client. His performance shall only be deemed to have been fulfilled if the client has received all the necessary documents completely and correctly.

4.3.3 Note for contractors based outside the EU

The contractual partner shall ensure that all EU directives applicable to its product or service to be provided are complied with.

If non-EU contractors supply CE-compliant components for power plant sites within the EU, they require an EU-based authorized representative/importer in accordance with EU law.

In any case, the requirements of the order must be complied with.

4.4 Quality Responsibility

Regardless of an inspection, construction supervision or even advice during the manufacturing and/or construction phase by the client, the manufacturer's responsibility for a design that complies with the order and the respective regulations lies with the contractor. The contractor undertakes to align its QM system with the "zero-defect strategy" and to carry out all necessary quality assurance measures. If the contractor detects deviations from the target state, he shall inform the client of this and immediately coordinate the planned remedial measures with the customer.

4.5 Quality Deviations

If the product or the service provided does not meet the agreed requirements or specifications, the customer (MAN ES) must be informed in writing by the contractual partner. For this purpose, the "FK0904 – Concession Application" must be used. Deviations, errors and damages are only to be retained if MAN ES has approved them in writing. Without this approval, the service shall be deemed to have been rejected.

4.6 Quality Inspection

The contractor carries out suitable tests on its own responsibility, records quality-influencing process parameters as well as the results of quality tests and keeps them in accordance with the state of the art or in accordance with the legal requirements.

4.7 Marking

The marking of products, components, parts and their quality documentation must enable secure and unambiguous identification. The traceability of the materials and sub-components used must be ensured. If there are special requirements of the client and/or the EU directives/standards or through contractual agreements, these must be complied with.

Each document, protocol, certificate, test report, confirmation or order-related record must comply with the requirements of the order, specifications and applicable laws and standards.

4.8 Changes in the processes

The contractor shall ensure that changes/disruptions in the processes, within the entire process of its order processing, have no impact on the commissioned overall system / product or its reliability (product lifetime).

If effects on order processing are to be expected, e.g. scheduling, capacity problems, deviations from the target state or other disruptions, these must be communicated to the customer immediately.

4.9 Production sites

If the contractor intends to carry out the production in whole or in part at third party production sites, he must inform the client sufficiently in advance. In any case, the contractor must ensure that the same criteria and contract contents also apply there and that the quality is adhered to without restriction.

The client reserves the right to reject individual production sites or to release them only after prior auditing.

4.10 Purchasing, engaging subcontractors

The purchasing of components/materials for the construction of the commissioned scope is carried out by the contractor. In individual cases, provision may also be provided by the client.

The contractor shall carry out an incoming goods inspection. In the event of deviations, he takes the necessary measures against his supplier.

If the client makes specifications to the contractor with regard to the purchase of certain individual components, the contractor shall comply with them. These specifications do not release the contractor from his manufacturer and/or quality responsibility, both for these individual components and for the overall order.

Unless the client has made any other specifications with regard to quality assurance, quality documentation and/or technical documentation for the purchasing of components/materials for the construction of the commissioned scope by the contractor, the contractor shall ensure that he receives sufficient quality documentation to prove the delivery quality of his subcontractors. If technical documentation (including operating and assembly instructions) and planning documentation (drawings, data sheets, terminal diagrams, etc.) are required for components, the contractor shall request these and forward them to the customer. In the standard, the following applies to purchasing: Components conform to the points 4.3.1 EU laws and directives or 4.3.2 Special arrangement for power plants and installations located outside the EU. Particular reference should be made to the regulations on safety components and equipment components with a safety function.

4.11 Compliance with regulations, standards and laws relating to environmental protection

The aim of the client is to avoid or minimize the negative effects of its products on people and the environment, taking into account technical and economic aspects. Legal and normative requirements must be complied with. The client has therefore set up an environmental management system in accordance with ISO 14001. The contractor is obliged to comply with measures to protect the environment.

4.11.1 Materials, Ingredients

The use of certain materials and ingredients is regulated by law (e.g. ban on heavy metals, asbestos, etc.). The contractor is obliged to comply with these provisions. For regulated and/or hazardous materials, the

contractor shall prepare material/safety data sheets in accordance with the applicable specifications and attach them to the technical documentation for the client.

4.11.2 Emission

The contractor must minimize exhaust gas, noise, substance emissions and radiation in accordance with the current state of the art and comply with the respective applicable regulations. The specifications and requirements from the order must be complied with.

4.11.3 Recycling

The use of non-reusable materials should be reduced as far as possible. Recyclable materials must be labelled as far as possible. The ability to dismantle must be ensured by design.

5 Procedure for order processing

5.1 General

In many cases, after completion of the order scope and picking at the contractor's premises, a direct shipment is made to the agreed delivery address.

The client is free to be present free of charge during intermediate inspections and final inspections (if necessary, also with his customer or a third party commissioned by the customer) on site (usually at the contractor or his subcontractors) and to carry out an inspection of the order (quality, schedules, shipping) and a review of the documents.

MAN ES also intends to carry out intermediate and final inspections via data glasses or other suitable devices/tools (remotely) whenever practicable. Remote inspections are an alternative method for inspecting modules, components, etc. For this purpose, an information exchange system is used, which enables interactive audio/video streaming. Preferably, the web-based application software "PrimeServ EyeTech" should be used. The software allows project participants to view the inspection object, regardless of location. The contractor must ensure that the use of such remote audio/video streaming technology is permitted and possible on its premises. An employee/representative of the contractor is responsible for the operation of the streaming device. There are several benefits for stakeholders, including increased security, reduced travel costs and time, and reduced disruptions. In addition, deviations detected at an early-stage lead to lower rework efforts.

The basis for quality monitoring on the part of the customer is a scope of testing agreed with the contractor, if applicable, the results of these tests (target/actual comparison), the results of the production tests/monitoring carried out by the contractor on his own responsibility, the quality documentation, an on-site inspection or remote inspection, if applicable, and the associated release for use of the components via the quality reports signed by the contractor.

5.2 Inspection Scope

The inspection scope consists of:

- Production-related tests (e.g. incoming goods inspections, non-destructive material tests, dimensional tests, performance tests, etc.)
- Functional tests, final inspections, etc., carried out by the contractor before delivery of the components/equipment in his factory (Factory Acceptance Tests - FAT)
- Completeness checks before shipment by the contractor and, if applicable, by the client
- Incoming goods inspection at the customer's premises or on the construction site
- Functional tests during assembly (Site Acceptance Test – SAT), e.g. on the construction site by the client or his representative.

5.3 Provision of Test Plans

In consultation with the client, the contractor shall draw up test plans that apply to the scope of the order. Inspection plans are also known as Inspection and Test Plans (ITP), Test Plans, or Quality Control Plans (QCP).

5.3.1 Contents of the Test Plans

The approval of the test plans is carried out by the system quality.

The following production / process steps must be carried out at least:

- Type of tests (what)
- References to applicable test and/or work instructions - Test procedures (how)
- Scope of test or test intensity (how often)
- Reference to applicable norms and standards
- Place, location, place of the test to be carried out (where)
- Expected results of the tests (value or condition) and applicable tolerances
- Documentation of the test results (target / actual value)
- Status of inspection point (Inspection Code, H = Hold point, W = Witness point, R = Review point)*, Inspection codes must be entered in the ITP for each production / process step (for the "Final Inspection of all modules" (FAT) production step, at least one "W" must be entered at MAN ES)
- If necessary, involvement of a Notified Body

*= Inspection Code:

H = Hold point: Client must be informed of the test date; without the customer's participation in the test or without his prior written approval for the test, production and other activities on the product must be stopped.

W = Witness point: Client must be informed of the test date

R = Review point: Document review

5.3.2 Inspections during Production

As a rule, the contractor carries out the tests and inspections during production in accordance with corresponding test plans drawn up internally and coordinated with MAN ES. The documentation of the results will be made available to MAN ES.

5.3.3 Pre-Shipment Inspection (PSI)

The completeness check before dispatch is the responsibility of the contractor. If necessary, the client or a person authorized by him will participate.

5.3.4 Incoming Goods Inspection at the Place of Delivery

The incoming goods inspection at the place of delivery is carried out by the client, limited to identification, transport damages and completeness.

5.3.5 Functional Test during Assembly

The client or his representative will carry out functional tests on the construction site. The scope of these tests is usually agreed in advance between the client and the contractor.

5.4 Approval of Use by the Contractor, Quality Report

The Quality Report (FK 0920) is an order-specific, binding document.

The Quality Report form (FK 0920) is sent to the contractor by the client or his representative on an order-specific basis. The Quality Report is signed by the contractor after completion and its release for use. The contractor thus bindingly confirms the conformity of its trades with the customer's order as well as the conformity of the test results of the overall system and its parts systems with the ordering and system requirements (target/actual comparison). His scope of services is thus released by him for use.

5.5 Order Fulfillment Process for Quality Monitoring

Immediately after receipt of the order, the contracting party shall contact the client (plant quality, see section 5.5.2 Contact person for quality issues of the client) to clarify whether the order requires test planning to be agreed upon between both parties.

If a Test Plan is required for coordination, the contractor shall prepare the Inspection and Test Plans (ITP) necessary for the scope of supply/services in accordance with section 5.3 Provision of Test Plans and terminates the hold and witness points (H = Hold point and W = Witness point).

These Test Plans must be submitted to the client or his representative for coordination/approval no later than five working days after receipt of the order (if necessary, in a first version; Subsequent versions are to be managed via revision indicators). The contractor shall take into account the customer's requirements and incorporate them into its inspection plans.

At least ten working days before the Hold point and/or Witness point (in accordance with ITP) reaches the deadline, the contractor shall inform the client (plant quality) of the actual date of the inspection. A coordinated appointment/visit is made between the client and the contractor.

Attention:

H = Hold point: The client must be informed of the test date. Without the client’s participation in the inspection or without his prior written approval for the inspection, production must be stopped.

If a participation/inspection by the client takes place, the contractual partner shall make the components accessible and support the inspection, e.g. measurement, etc., in accordance with the client's requirements. At the same time, he provides the protocols/test reports from the previous tests as well as material certificates, proofs, etc. ready for inspection. Subcontractors are to be obligated accordingly by the contractor.

If an inspection report (checklist / punch list) of MAN ES on the scope of supply/services of the contractor has been filled out, possibly with a list of remaining points (punch list), the contractor receives this from the client. The procedure for the remaining points list (punch list) must be regulated immediately between the client and the contractor.

5.5.1 Contact Person for the Contractor

In its protocol according to section 5.3 Provision of Test Plans the contractual partner shall appoint a permanent contact person for the order. This person takes over the entire coordination and communication with the client (Plant Quality) for the order.

5.5.2 Contact Person for Quality Issues of the Client

The contact person for all matters arising from this contract is the

Plant Quality

Telephone number:	+49 821 322 6592
Fax:	+49 821 322 3460
Email:	Power-Quality-HSE@man-es.com

5.6 Quality Documentation (order-specific)

In order to prove compliance with the quality characteristics and requirements, the contractor will prepare suitable documentation internally. As a rule, this includes the scope of the documentation to be transmitted to the client, cf. also order and specifications. In addition, the contractor must ensure that its internal documentation complies with the legal requirements and the state of the art. After prior notice, the client can view project/order-relevant documentation.

Whenever a Test Plan or an Inspection and Test Plan (ITP) has been agreed upon for the order, an agreement is also reached on the scope of the documentation to be handed over to the client.

5.6.1 Scope of Quality Documentation

The scope of the quality documentation shall be structured and delivered at least as follows:

0. Cover page with table of contents
1. MAN ES Quality Report
2. Identification of Modules (drawing, nameplate, ...)
3. Inspection and Test Plan (ITP, inspection plan, quality plan)
4. Welding documents (WPQR, WPS, welder, NDT inspectors)
5. Test reports (non-destructive testing – NDT, leak tests, pressure tests, test run, ...)
6. Non-Conformity Report
7. Conformity Certificates
8. Calibration Certificates
9. Material / Test certificates (material certificates according to DIN EN 10204 (at least 3.1 certificates))

For details, see "FK3979 - Requirements for the MAN ES Standard Final Q-Documentation" and the corresponding "Template for FK3979".

If the order does not require anything to the contrary, the contractual partner shall send the documentation to the client or his representative at short notice, max. two weeks after the last inspection.

5.6.2 Form of Documentation

In any case, the contractor will provide an order-specific document compilation for the scope of the documentation. This shows the order assignment and the marking of the module / component, see also section 4.7 Marking. The contents of the documentation comply with the requirements of FK3979 "Requirements for the MAN ES Standard Q Final Documentation", unless otherwise agreed. The quality documentation is always provided in PDF format with bookmark structure in a language coordinated with plant quality (project-specific).

Hint:

The order shall only be deemed to have been fulfilled if the agreed quality documentation is complete and correct for the client. For data processing reasons, it is possible that the quality documentation is ordered with a separate order item, assigned to the order (order confirmation for this item is then required).

Note:

Instructions for the operator as well as operating instructions with safety instructions are to be delivered without being asked. Ordered technical documentation must be handed over to MAN ES on an order-related basis. Quality documentation is not technical documentation, but it is an independent type of document. The technical documentation is specified in a separate policy (see separate item in the purchase order).

6 Procedure in case of delivery defects

Incoming goods inspection at the client's premises is carried out in accordance with section 5.3.4 Incoming Goods Inspection at the Place of Delivery and 5.3.5 Functional Test during Assembly. Known defects are to be handled according to section 4.4 Quality Responsibility. Approved deviations must be attached to the goods. Notices of defects that were already present at the time of the handover of the service, but can only be determined during use, will be reported to the contractor immediately, at the latest, within five working days after their discovery. The contractor acknowledges justified defects. Further provisions shall be laid down in the framework or delivery contract.

7 Procedure in case of service/performance deficiencies

The service is provided in accordance with the contractually agreed conditions and to the extent specified therein. Known defects are to be handled according to section 4.4 Quality Responsibility. Deviations from the specifications set out there must be reported to the client without delay. The contractor acknowledges justified defects. Further provisions are regulated by the framework or delivery contract.

8 Other

If the contractual partner does not have the FK 0920 Quality Report form, the contractual partner shall request it from the client or his representative.

The form is also available on the Internet at

https://www.man-es.com/documentation-/mandocumentation

retrievable.

9 Contact Details

Contact details for the provision of quality documentation:

MAN Energy Solutions SE

Plant quality

Telephone number:	+49 821 322 6592
Fax:	+49 821 322 3460
E-mail:	Power-Quality-HSE@man-es.com

10 References

Further applicable documents always refer to the current version unless stated otherwise.

FK0904
FK3979
FK0920
I2132

11 Appendices

The appendices always refer to the current version unless stated otherwise.

Appendix I Sample ITP

Appendix I

The information in the red box is mandatory!

ITP - Inspection & Test Plan

Supplier Name and Address
Location of Manufacturing

Supplier Logo

Version: xxxx
Date: xxxx
Issued by: xxxx
Checked by: xxxx
Approved by: xxxx

Customer: MAN Energy Solutions SE
Project No.: 530xxxxx
Product Name: xxxxxxxx
MAN Order No.: 450xxxxx
Supplier Order No.: xxxxxxxx

Pos. No.: xx

Project Name: xxxxxxxx
MAN Material No.: 11.xxxxx-xxxx
Quantity: xx
Serial no.: xxxxxxxx

Inspection Code
H Hold Point
W Witness Point
R Review Point

Pos.	Production- / Process Steps (Incl. Scope)	Ref. Doc.	Standard Norm	Subordinate Documents	Responsible Department	Inspection Code Manufacturer	Inspection Code MAN	Inspection Code Customer	Inspection Code Third party	Date	Name & Signature (Responsible person)	Remarks
1	Design Check					H						
2	Specification Check								H			
3	Material Specification					H						
4	Incoming Goods Inspection					H						
5	Visual Inspection before welding					H						
6	Welder qualification certificates					H						
7	Welding procedure					H						
8	Visual Inspection of welding seams					H						
9	NDT of welding seams					H						
10	Pressure test of complete system					H						
11	Dimensional control of steel construction, position components, flanges					H						
12	Check of surface treatment and painting					H						
13	Check of control panel and cabeling					H						
14	Functional Testing on testbed and simulation of signals					H						
15	Preparation and check of Test Reports					H						
16	Test Report Verification					H						
17	Initial Inspection of first module					H						
18	Final Inspection of all modules					H						
19	Create final QA documentation					H						
20	Check of size & quantity					H						
21	Conservation & Packing					H						
22	Marking					H						

Inspection Code must be filled in for each Production- / Process Step. (see Q10.09028-2101, Ch. 2.2.2)

For the Production Step "Final Inspection of all modules" (FAT), at least Inspection Code "W" Witness Point" must be marked for MAN

page 1 of 1