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Special Equipment Safety Specifications

TSG D7001-2013

Pressure Piping Components Manufacture

Supervision Inspection Regulation

压力管道元件制造监督检验规则

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Pressure Piping Components Manufacture Supervision Inspection Regulation

Article 1 In order to standardize the supervision-inspection of pressure piping components, this Regulation is formulated in accordance with the *Special Equipment Safety Supervision Regulations*.

Article 2 This Regulation applies to the manufacturing supervision-inspection of the pressure piping components (hereinafter referred to as the products) that are subject to the implementation of the *Pressure Pipe Component Manufacturing License Rules* (hereinafter referred to as the supervision-inspection).

Article 3 The product supervision-inspection shall be undertaken by the special equipment inspection agency (hereinafter referred to as the supervision-inspection agency) with corresponding qualifications at the local manufacturer.

Article 4 The supervision-inspection refers to the conformity verification of the product by the inspection and inspection institution on the basis of the qualification of the product quality inspection and test (hereinafter referred to as self-test) in the manufacturing process of the product. The supervision-inspection cannot replace the self-test of the manufacturer.

Article 5 The supervision-inspection specified in this Regulation is divided into three methods: one-by-one, batch-by-batch and annual.

The scopes of products for implementing one-by-one and batch-by-batch inspections are shown in Annex A. The products not listed in Annex A shall be subject to annual supervision-inspection.

Article 6 For the supervision-inspection items and requirements, please refer to the "Supervisory Inspection and Inspection Outline for Pressure Piping Components" (Annex B, hereinafter referred to as the "Supervision-inspection Outline").

The inspector who undertakes the supervision-inspection (hereinafter referred to as the supervision-inspection personnel) shall fill in the results of the supervision-inspection results in the "Pressure Piping Component Manufacturing Supervision-inspection Items List" (see Annex C, hereinafter referred to as the "Supervisory and Inspection Project List").

Article 7 The supervision-inspection agency shall, on the basis of the

- VI** List of certified welders for welding products (listing license items, expiration date, welder code, etc.), list of product quality inspectors, list of nondestructive testing products (listing of certificates, grades, expiration date, qualification number, etc.);
- VII** Qualified (subcontracted) party list and evaluation report, subcontract and subcontractor qualification and relevant personnel qualification certificate (with administrative license requirements);
- VIII** Relevant records of quality assurance system implementation such as management review, non-conforming product (item) control, quality improvement and service;
- IX** Related product standards, design documents (where applicable), process documentation, and inspection and test records;
- X** Welding procedure assessment list;
- XI** Type test report and type test certificate;
- XII** Product contract and technical agreement;
- XIII** Other materials required by the supervision-inspection.

When the information specified in the preceding paragraph changes, the manufacturer shall promptly notify the supervision-inspection personnel and replace it with a valid version.

Article 16 The supervision-inspection personnel shall carry out the supervision-inspection in accordance with the provisions of this Regulation and the instructions for the supervision-inspection, record the supervision carried out, and timely provide relevant witness information (design materials, inspection and test reports, etc.) provided by the manufacturer, sign for confirmation on the form of the record, card, etc.)

Article 17 If the supervision-inspection personnel has doubts about the relevant witness information provided by the manufacturer or finds that it does not meet the relevant safety technical specifications and the corresponding standard requirements, he has the right to request the manufacturer to carry out re-inspection or supplementary inspection.

Article 18 When the supervision-inspection personnel fill out the "Supervision-inspection Project List", they shall record the supervision inspection process and results. Fill in "conformity", "non-conformity" or "no such item" in the "Supervisory Inspection Results" column of the "Supervision-inspection Project List". Fill in the name of the inspection witness or the name of the supervision record in the "Work Witness" column. In the "Notes" column,

supervision-inspection within 6 months before April 5, 2014. The next supervision-inspection date shall be scheduled for the first 6 months of April 5, 2015 (not according to the implementation date of the supervision-inspection), and so on. However, it cannot exceed the validity period of the special equipment manufacturing license, that is, April 5, 2017 (according to the special equipment manufacturing license valid for 4 years).

Article 21 For the products that have passed the one-by-one, batch-by-batch inspections and comply with relevant safety technical specification and corresponding standards, the supervision-inspection agency shall adopt the appropriate method according to the technical characteristics of the products and the actual situation of the production and management of the product of the manufacturer, mark the inspection mark on the obvious part of the product.

Article 22 For products that are subject to batch-by-batch inspection, if the inspection items do not comply with the relevant safety technical specifications and their corresponding standards, the batch shall be inspected one by one (set, piece).

Article 23 In the implementation of annual supervision, the inspection and inspection agency shall, in accordance with the annual period specified in Article 20, conduct at least a batch of products for each product of each category (scope) for supervision-inspection. If the sampled products can be covered downwards in accordance with the relevant provisions of the manufacturing license, the high-grade products of the variety shall be checked. When the supervision-inspection items of products that cannot be covered by each other do not comply with the relevant safety technical specifications and their corresponding standards, the current annual inspection results of the products (variety, scope) represented by this level shall be concluded as “non-conformity”.

When the supervision-inspection items of the products that can be covered downwards do not meet the relevant safety technical specifications and their corresponding standards, the current annual inspection results of the products (variety, scope) represented by the level shall be “non-conformity”. And it shall also conduct a spot check on the next level of the product, and so on.

Article 24 When the product leaves the factory, the manufacturer shall provide the supervision-inspection certificate if it implements the inspection of the product quality and the approval of the product in accordance with the relevant safety technical specifications.

Article 25 The supervision-inspection agency shall keep the "One-by-one, batch-by-batch supervision-inspection certificate", the "Annual Supervision-inspection Report", the "Supervisory and Inspection Project List", the "Quality Insurance System Inspection Project List", the "Supervisory Inspection Liaison Form" and the "Supervisory Opinions" as well as other materials deemed

Annex B

Supervisory Inspection and Inspection Outline for Pressure Piping Components

B.1 Data review

B.1.1 Implementation specifications, standards (for products that can be produced according to product standards, no design documents required): review whether the safety technical specifications selected for the product and their corresponding product standards are current and effective.

B.1.2 Design documents

B.1.2.1 Design pattern

Review whether the safety technical specifications selected for the design and their corresponding product standards are current and effective, whether the marked inspection and test requirements meet the product standards and technical requirements of the contract, and whether the pattern signing procedures are in compliance with the regulations.

B.1.2.2 Design calculation book

Review whether the strength check has been carried out, whether there is compensation amount calculation (applicable to the metal bellows expansion joint), check whether the signature procedure meets the requirements.

B.1.2.3 Design change

Review whether the design change (including material substitution) procedures are in compliance with the regulations.

B.1.3 License, type test documents

Review whether the license, type test (including design review, inspection and test) certification documents and their results meet the requirements, whether cover this batch of products.

B.1.4 Stereotype test report

Review whether the stereotype test report is valid and whether it can cover this batch of products.

B.1.5 Process documents

Review whether the product process documentation is complete and complete,

Including raw materials for pressure components, main parts and materials, sealing components, welding materials and purchased parts. The raw materials of polyethylene and polyethylene composite pipes also include compounding ingredients.

B.2.2.1 Material acceptance

- (1) Review whether the material quality certificate is valid, whether the content meets the relevant standards and technical requirements of the contract, and whether the data is complete, correct and clear.
- (2) Check whether the physical mark of the material meets the material standard, whether it is consistent with the material quality certificate, and whether it is inspected according to the regulations.

B.2.2.2 Material performance check

If the manufacturer adds other necessary additives or reuse materials to the polyethylene base resin, review the performance test report or the return material addition record, check whether the basic properties of the compound or the added amount of the recycled materials meet the requirements.

B.2.2.3 Material mark

Check whether the preparation, marking method, location and mark implant of the manufacturer material mark (traceability mark) comply with the provisions.

B.2.2.4 Material reinspection

If material reinspection is required or if the supervision-inspection personnel deems it necessary to require the manufacturer to carry out reinspection, it shall examine whether the project re-inspected by the manufacturer and its results meet the relevant standards and technical requirements of the contract.

B.2.3 Manufacturing process implementation

Review product manufacturing process operation records and inspection records for compliance with relevant safety technical specifications and their corresponding standards. Check the implementation of the product manufacturing process if necessary.

NOTE B-1 Some product manufacturing process is as follows (for reference):

- (1) Polyethylene pipe, including raw material drying, extrusion, traction, sizing, etc.;
- (2) Polyethylene composite pipe with metal skeleton, including processing technology and injection process of compounding;

NOTE B-3 Some products physical and chemical inspection items are as follows (for reference):

- (1) Seamless steel pipe: chemical composition, metallography, hardness, tensile, Charpy impact, intergranular corrosion, non-metallic inclusions, actual grain size, etc.;
- (2) Welded steel pipe: chemical composition, metallographic, tensile, Charpy impact (when applicable), drop hammer (when applicable); for stainless steel, it also includes grain size determination and corrosion resistance test;
- (3) Cast iron pipe: chemical composition, hardness, stretching, etc.;
- (4) Polyethylene pipe: elongation at break, thermal stability (oxidation induction time), melt mass flow rate, etc.;
- (5) Polyethylene composite pipe with metal skeleton: tube longitudinal dimensional shrinkage test, etc.;
- (6) Steel butt joint pipe fittings, steel butt jointed pipe fittings and valves (for valves suitable for castings and forgings of self-casting and self-forging manufacturing units): chemical composition, metallographic, hardness, tensile, Charpy impact, etc.;
- (7) Power station combination device: metallography, spectrum, hardness, etc.

B.2.10 Performance test

Review the performance test report and check whether the product performance test meets the product standard and the technical requirements of the contract as follows:

- (1) For the implementation of batch-by-batch inspection, at least extract one (set, piece) from each batch of products for the performance test.
- (2) For the implementation of one-by-one inspection, perform the performance test one by one.
- (3) For the implementation of annual inspection, it only perform the performance test for the extracted products.

NOTE B-4 Some product performance test items are as follows (for reference):

- (1) Seamless steel pipe: process performance test including flattening and flaring; guided bending test for submerged arc welded steel pipe;
- (2) Gas pressure regulating device: simulation working condition debugging;
- (3) Regulating valve: basic error, rated stroke deviation, always point deviation, dead zone, hysteresis.

NOTE B-6 Leakage test is divided into air tightness test and ammonia leakage test, halogen leakage test, kerosene leakage test and nitrogen leakage test according to different test media. The test method used shall be in accordance with relevant standards and drawings. The various terms of the partial pressure piping component leakage test are as follows:

- (1) Air tightness test for cast iron pipe, gas pressure regulator;
- (2) Kerosene leakage test, air tightness test for metal bellows expansion joint;
- (3) Seal test for valve in general; halogen leak test, kerosene leak test and nitrogen leak test are also available on special requirements.

B.2.13 Coating quality

Review the supervision-inspection record. And check whether the product coating quality meets the product standard requirements according to the following regulations:

- (1) For the implementation of batch-by-batch inspection, at least follow and extract one (set, piece) from each batch of products for the inspection of coating quality.
- (2) For the implementation of one-by-one inspection, perform the inspection of coating quality one by one.
- (3) For the implementation of annual inspection, it only perform the inspection of coating quality for the extracted products.

B.2.14 Safety accessory

If it is necessary to configure the safety accessories, check whether the quantity, model specifications and product quality certification documents meet the requirements.

B.3 Product exit-factory inspection

B.3.1 Product mark

Check whether the product mark meets the relevant requirements in accordance with the following regulations.

- (1) For the implementation of batch-by-batch inspection, at least follow and extract one (set, piece) from each batch of products for the mark inspection.
- (2) For the implementation of one-by-one inspection, perform the mark inspection one by one.
- (3) For the implementation of annual inspection, it only perform the mark

Piping Component Manufacturing Permit Regulations" (TSG D2001).

D.2 Implementation inspection items and requirements for quality control elements

D.2.1 Product manufacturing control

Extract 1 to 3 representative product materials that have been shipped this year for retrospective review, and check system implementation from design, process, materials, welding, heat treatment, non-destructive testing, final inspection, etc. The main contents are as follows:

- (1) Check the control of product design input, output, review, change, verification, etc. Check whether the drawings comply with the corresponding specifications and standards, and whether the drawings and design changes of the external design documents meet the requirements of the design control procedures.
- (2) Check whether the technical documents such as the quality plan of the manufacturer meet the requirements of the product standard, and whether the implementation of the main or key processes is carried out.
- (3) Check the controls of procurement, acceptance, storage, issuance, and substitution of materials (including welding consumables, pipes, forgings, etc.) Randomly check whether the acceptance, storage, receipt, drying, and recycling records of the welding materials, the storage conditions and drying conditions meet the requirements of the program documents.
- (4) Check whether the controls of welding (including welding process qualification report and specimens, welding process, welder qualification, welding record, welding inspection, welding rework, etc.) comply with the requirements of relevant standards, specifications, quality assurance system documents.
- (5) Spot check product physical and chemical inspection report. Review whether the inspection methods, inspection conditions and indicators meet the technical requirements of the product standards and contracts, and whether the signature procedures are in compliance with the regulations.
- (6) Check the consistency of the heat treatment temperature automatic recording curve and the heat treatment process. Review the heat treatment report and check whether the signature procedure is in compliance with the regulations.
- (7) Check whether the controls of non-destructive testing (including equipment capability, equipment calibration, testing process, testing

manufacturing license conditions of the corresponding products. If subcontracting is allowed, the following shall be checked:

- (1) Whether the subcontractor is evaluated according to the provisions of the procedure document;
- (2) Whether the subcontracted non-destructive testing organization and its personnel have corresponding qualifications and qualifications;
- (3) Whether the physical and chemical inspection, heat treatment and loss detection report are reviewed by the responsible personnel of the subcontractor according to the provisions of the procedure documents;
- (4) Whether the personnel responsible for physical and chemical testing, heat treatment and non-destructive testing have confirmed the quality of the subcontractor's process and inspection;
- (5) Review the inspection and inspection work of the subcontractor (if necessary).

D.2.7 Equipment and inspection as well as test equipment control

View device files and ledgers. Check that the main equipment, tooling, and mold used in manufacturing are in good condition. Check the measuring instruments on the product manufacturing equipment (such as ammeter, voltmeter, pressure gauge, thermometer, etc.) Check for a certified (calibrated) pass mark and whether it is within the validity period. Spot check the measuring instruments, devices and measuring tools for inspection and testing. Check whether the relevant provisions of the measurement procedure document are met.

D.2.8 Control of rejected product (item)

Review rejected product (item) report. Check whether the evaluation and disposal meet the requirements of the program documents.

D.2.9 Quality improvement and service

Check internal quality audit records and reports. View quality information feedback, data analysis, and processing. Track and check whether the problems raised by the "Supervisory Inspection Liaison Form" and "Notice of Supervisory Opinions" concerning the products have been improved in time.

D.2.10 Personnel training, assessment and management

Examine the newly-employed quality system responsible personnel, inspectors, product performance testers and other personnel who have an important impact on product quality. Check the renewal of the certificate holder and the further education.