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**PROCESS OPERATION SHEET  
FOR MANUFACTURING PROCESS QUALITY CONTROL  
(STANDARD FORM)**

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## **Step-by-step manufacturing process quality control**

### **1. Field of application**

**1.1.** This operation sheet has been developed for step-by-step quality control of works, performed during construction of a pipeline in compliance with the requirements set forth in:

- **GOST<sup>1</sup> 5264-80\*** “Manual arc welding. Welded joints. Basic types, structural members and dimensions”.
- **GOST 9467-75\*** “Metal coated electrodes for manual arc welding of structural and thermal-resistant steel. Types”.
- **GOST P 51164-98** “Main steel pipelines. General requirements as to protection against corrosion”.
- **GOST 24297-87** “Incoming inspection of products. Basic provisions”.
- **SNiP<sup>2</sup> 3.05.05-84** “Process equipment and process pipelines”.
- **SNiP 2.05.13-90** “Oil-product pipelines, constructed within the territory of cities and other inhabited localities”.
- **SNiP 2.11.03-93** “Crude oil and petroleum products terminal stores. Fire protection regulations”.
- **SNiP 3.02.01-87\*** “Earthwork structures, bases and foundations”.
- **SNiP 12-01-2004** “Organization of construction”.
- **SNiP 12.03-2001** “Construction safety requirements. Part 1. General requirements”.
- **SNiP 12.04-2002** “Construction safety requirements. Part 2. Construction operations”.
- **SNiP 12-135-2003** “Construction safety requirements. Industrial standard instructions on occupational safety”.
- **RD 09-364-00** “Standard instruction on arrangement of safe hot works at explosive and flammable facilities”.
- **RD-11-02-2006** “Requirements to content of the as-built documentation and procedure of its keeping during construction, reconstruction and total overhaul of objects”.
- **RD-11-05-2007** “Procedure of keeping the general and (or) special log book for registration of works performed during construction and total overhaul of capital construction objects”.

### **2. General requirements to quality management system.**

Quality control of the works performed during pipeline construction shall be conducted in compliance with the requirements of the valid federal, industry regulatory documents, as well as according to the special technical specifications of a customer.

Quality control of the works performed during construction shall be arranged subject to “Standard provisions on arrangement of technical supervision over observance of design solutions and quality of construction, general overhaul and reconstruction”.

Prime contractor in charge of construction shall draw up a program on quality control during construction, containing procedures of quality control or plans of technical supervision and testing, applied for control of construction works’ quality.

Program of the quality control, drawn up by the prime contractor, shall contain the basic rules of quality assurance, which cover the set forth below types of activities:

- keeping the records, including reports, log books and permits for performing the works in compliance with the requirements of SNiP 12-01-2004, provisions, norms and regulations, being effective in the Russian Federation;
- incoming inspection of design documentation;

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<sup>1</sup> GOST – State Standard

<sup>2</sup> SNiP – Construction Norms & Regulations

- acceptance of set out geodetic control network;
- incoming inspection of applied products, materials and equipment;
- in-process inspection during execution of operations and upon their completion, as well as assessment of conformity of those works, which results become noninspectable after commencement of the subsequent works;
- execution, limitation and regulation of deviations from norms and regulations and taking corrective actions to prevent the non-conformities;
- regulatory review of construction documents in order to ensure that their last revision is applied, only;
- supervision over the operation of measuring and testing equipment and its checking-out;
- definition of certain job duties (job descriptions), field of competence, responsibilities and organizational structure of the quality assurance service staff.

### **Incoming inspection.**

Prior commencement and during the process of construction incoming inspection of materials and equipment shall be conducted by “BBBB” LLC., with direct involvement of the customer’s technical supervision and, if required, field supervision of designer and operating entities.

In the process of incoming inspection of materials and equipment, required for the pipeline construction, services of the contractor shall perform:

- acceptance, rejection and inspection of pipes, pipelines’ details and fittings, including:
- for their compliance with the specifications indicated in the certificates and envisaged by the relevant Technical specifications, GOST or OST<sup>1</sup>;
- for absence of inadmissible mechanical damages, metallurgical defects and corrosion, including laminations extended on the products’ edge and surface, handling marks, grooves, dents on the body and ends;
- for a value of wall thickness deviation from the standard parameter;
- for compliance of deviation value of angle of chamfer, ends’ cutting angle, out-of-roundness along the ends, pipe bending and inside weld flush finish with the requirements of the valid norms and regulations.

Specialists of contracting company shall perform visual inspection control for 100% of pipes, connecting pieces and shut-off valves. They also ensure:

- quality control of all incoming welding materials to be performed by the specialized incoming inspection services of the contractor or relevant commission:
- compliance of electrodes, wires, etc. to the requirements of the valid norms and regulations;
- availability of certificates, specifications and licenses (issued by the National Agency of Non-Destructive Testing and Welding) for each lot and grade of materials, compliance of marking and reference designation of welding materials with the ones indicated in the certificate and on the packaging;
- proper condition of packaging, surface electrodes’ coating, surface or welding rod, homogeneity and color of flux grains, etc.;
- compliance of the applied materials’ grades with the ones indicated in the welding process operation sheets;
- correct storage of welding materials, availability and good working condition of baking ovens for electrodes, as well as heated quivers for storing the electrodes at welding operator’s workplace;
- check of electrodes’ welding and processing properties.

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<sup>1</sup> OST – Industry Standard

Specialized incoming inspection service of “BBBB” LLC. shall check the quality of all incoming insulation materials, during which there should be ascertained the following:

- compliance of heat shrink sleeves (gaskets) with the requirements of the project, norms and regulations;
- compliance of insulation materials’ storage conditions with the requirements of norms and regulations;
- availability of certificates for each lot and grade of materials;
- compliance of applied insulation materials’ grades with the project requirements.

Specialized incoming inspection services of “BBBB” LLC. shall check the quality of all incoming materials, products and appliances, necessary for performance of civil and erection, electric installation and other works envisaged by the project.

In case if it is revealed that the arrived materials and equipment do not comply with their range, quality, quantity and completeness indicated in the accompanying documents of the supplier, as well as in case if the quality of material and technical resources does not meet the specified requirements (dents, scratches, failure to operate, breakage, leakage of fluid materials, etc.), commission shall issue the Report of materials’ acceptance, composed according to the set from.

#### **In-process inspection.**

In-process inspection shall be conducted by work performer, work superintendant, foreman; they shall check:

- compliance of sequence and content of the performed process operations with the process flow and regulatory documents, which cover such operations;
- observance of processing conditions, set forth in the process sheets and procedures;
- compliance of quality indices of performance of the operations and their results with the requirements of design and process documentation, as well as regulatory documents, which cover these process operations.

#### **Instrumental monitoring.**

During performance of the installation and construction works instrumental monitoring shall be carried out at all stages of the pipeline construction: securing the pipeline routes, earthwork operations, welding of pipe joints, works on insulating and stringing, and works on electrochemical protection.

Devices and tools (except for the simplest probes and gauges), designated for control of materials and works quality, should be plant-manufactured and have certificates, confirming their compliance with the requirements of the State standards or Technical specifications.