Siempelkamp
Prüf- und Gutachter-Gesellschaft

Dresden, April 01, 2025

Offer No. 106556

to

NPP Kozloduy, Bulgaria

about

Identification of product analogues of Russian steels and welding materials (Part 1) and material tests on welded structures (Part 2)

(Technical and commercial part)

Approved test body of the TÜV SÜD
Industrie Service GmbH

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Siempelkamp
Prüf- und Gutachter-Gesellschaft

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1 Company Description

Siempelkamp Prüf- und Gutachter-Gesellschaft mbH (following named as SPG) is a subsidiary of Siempelkamp Maschinen- und Anlagenbau GmbH with head office in Krefeld. The scope of supply and services of SPG comprises industrial services on the areas of material and component testing, plant inspection as well as strength calculation of components and power plant assemblies.

2 Statement of Facts and Subject Matter

The company NPP Kozloduy, Bulgaria (following named as Purchaser) has published a call No. 55765 for identification of product analogues of Russian steels and welding materials (part 1) and material tests on delivered welded specimens (part 2).

Our offer is based on E-Mail with the technical requirement from Mr. Aleksandrov, 20th March 2025.

3 Scope of Supply and Services of SPG

The scope of supply and services of SPG include:

Part 1: Market consultation (call No. 55765)_Identification of product analogues of Russian steels and welding materials

The aim of the proposal is to generate a technical paper to compare different GOST steel grades with analogue steel grades standardized in current European and American standards and rules for replacement, repair, maintenance and welding procedures onsite the NPP Kozloduy in Bulgaria.

The proposal includes the research, collection and documentation of steel grades of European, German and American standards, that are comparable to:

- Steel grade VSt3sp according GOST 380,
- Steel grade VSt3sp5 according GOST 380,
- Steel grade 20 according GOST 1050,
- Steel grade 08X18N10T according GOST 5632,
- Steel grade CB-08X19H10XXX according GOST 2246-70,
- Steel grade CB-04X19H11M3 according GOST 2246-70,
- if possible, the issue period 1971 to 2014 as well as available.

The products of interest are rolled steel grades, pipes, forgings and steel sheets/plates as well as weld materials used for this steel grades. The weld materials have to be useable for weld process 141 according DIN EN ISO 4063:2023-07 (TIG welding).

The report includes:

- Documentation of two steel grades for each GOST steel, one whose properties best fit to the design properties and a general-purpose steel grade (incl. limiting operation conditions for the steel grades), one steel grade with best fitted mechanical properties and second grade with similar or general purpose to the mentioned steel grades
- Listing of requirements of the steel grades (e. g. tabular comparison of chemical composition, mechanical properties, delivery requirements, required data and tests according to the product standards and/or certificate according to DIN EN 10204:2005-01 (including advantages and disadvantages of GOST materials compared to other rules)
- Identification of differences in the material properties between various editions of standards for semifinished products of the named GOST steel grades from 1971 to 2014.
- Evaluation of the influence of the carbon content (if there are any indication in the rules)
- Evaluation of the influence of the grain size, if applicable and required for a 10204 certificate
- Differences in properties in the respective editions of the standards in the years 1971 to 2014 (if available)
- Documentation in English.

The following GOST standards are already available at SPG (digital and paper):

GOST 380: Carbon steel of ordinary quality. Types and general technical requirements, Issue Years 1960, 1971, 1994

GOST 1050: Carbon structural steel, Issue Years 1974, 1988, 2013

GOST 5632: High-alloy steels and alloys corrosion-resistant, heat resistant and heat-proof, Issue Years 1972, 2014

GOST 2246: Steel welding wire. Technical specifications, Issue Years 1970

GOST R 50.04.01-2018: Conformity assessment system for the use of nuclear energy. Conformity assessment in the form of testing. Qualification testing. General provisions, Issue Year 2018

GOST R 50.04.03-2018: Conformity assessment system for the use of nuclear energy. Conformity assessment in the form of testing. Qualification testing of welding (cladding) technologies, Issue Year 2018

GOST R 50.04.06-2018: Conformity assessment system for the use of nuclear energy. Conformity assessment in the form of testing. Qualification testing for new material (base or welding), Issue Year 2018

NP-104-18 Welding and surfacing equipment and nuclear power pipelines installations. Issue Year 2018.

Part 2: Material tests on delivered welded components (Test plan without own material procurement and own welding activities by SPG)

After acceptance of the report of part 1, a test program will be developed according GOST R 50.04.06-2018 Appendix A, GOST R 50.04.03-2018 page 6 and NP-104-18. The standard ISO 15614-1:2017 + Amd 1:2019 will be a reference as well.

According to the requirement of GOST R 50.04.06-2018 Appendix A the following investigations both on base metal and weld joints should be considered. The tests A4, A6, A7 and A8 are omitted due to yield strength under 600 MPa (A6) respectively due to lower operation temperature (A7, A8).

A4: Determination of physical properties:
Temperature range 20°C up to design temperature +50°C in 100 K steps. (has to be discussed with client)

A5: Determination of mechanical properties in tensile test and bending tests (at least 3 batches, Temperature range 20°C up to design temperature +50°C. Bending test only at 20°C, thermal aging)

A9: Determination of corrosion resistance.

Sampling: The supply of the materials (as-delivered) and from the welding joints have to be done by the customer. This includes all necessary material certifications (3.1 or 3.2 according EN 10204:2004), welding procedure specification (WPS). Further, a welding procedure qualification according ISO 15614-1:2017 + Amd 1:2019 is needed. Here the welding processes have to be supervised by a notified body. The range of non-destructive testing (NDT) and the scope of manufacture have to be discussed with the client. The mechanical test program has to be discussed and agreed with the notified body as well. Therefore, the following test program is only informative.

The test program for one group of welding joints resp. one type of welding material is shown in Table 1. The type and number of specimens is defined in the respective standards.

Standards (selection):

DIN EN ISO 15614-1:2020-05: Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2017 + Amd 1:2019);

DIN EN ISO 6892-1:2020-06: Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1:2019);

DIN EN ISO 4136:2022-09: Destructive tests on welds in metallic materials - Transverse tensile test (ISO 4136:2022);

DIN EN ISO 5173:2023-05: Destructive tests on welds in metallic materials - Bend tests (ISO 5173:2023);

DIN EN ISO 148-1:2017-05: Metallic materials - Charpy pendulum impact test - Part 1: Test method (ISO 148-1:2016);

DIN EN ISO 9016:2022-07: Destructive tests on welds in metallic materials – Impact tests – Test specimen location, notch orientation and examination (ISO 9016:2022);

DIN EN ISO 17639:2022-05: Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds (ISO 17639:2022);

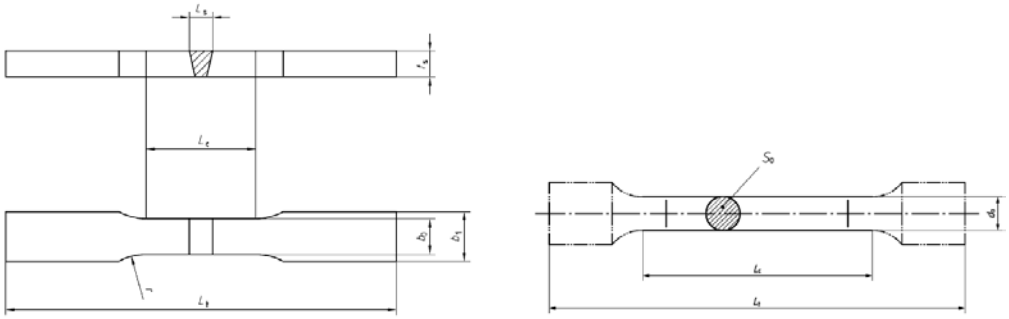
DIN EN ISO 6507-1:2018-07: Metallic materials - Vickers hardness test - Part 1: Test method (ISO 6507-1:2018);

DIN EN ISO 9015-1:2011-05: Destructive tests on welds in metallic materials - Hardness testing - Part 1: Hardness test on arc welded joints (ISO 9015-1:2001).

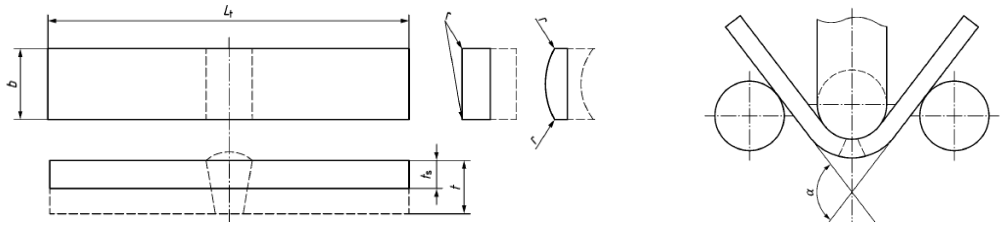
	Material/ weld joint/ standard						
		VSt3sp base metal + weld joint with S235JR GOST 380	VSt3sp5 base metal + weld joint with S235J0 GOST 380	grade 20 base metal + weld joint with C22E GOST 1050	grade 08X18H10T base metal + weld joint with X6CrNiTi18.10 GOST 5632	Welding consumables CB-08X19H10G2B wire, electrodes GOST 2246	Welding consumables CB-04X19H11M3 wire, electrodes GOST 2246
Test method/ Number of baches	Temperature	3 batches	3 batches	3 batches	3 batches	3 batches	3 batches
Analysis, Chemical composition (method OES)	+20°C	3	3	3	3	3	3
Tensile test at room temperature on base metal	+20°C	3	3	3	3	3	3
Tensile test at room temperature on welded joint	+20°C	3	3	3	3	-	-
Bending test at room temperature on base metal (1 specimen per batch)	+20°C	3	3	3	3	-	-
Bending test at room temperature on welded joints (2 specimen per batch, roof and top)	+20°C	6	3	3	3	-	-
Impact test at room temperature on base metal (3 series with 3 specimen per batch)	+20°C	9	9	9	9	9	9
Impact test at room temperature on welded joint (3 series with 3 specimen per batch and location: weld seam, fusion line)	+20°C	18	18	18	18	-	-
Impact test at minus temperature on base metal (3 series with 3 specimen per batch)	-20°C	-	9	-	9	-	-
Impact test at room temperature on base metal after aging treatment (3 series with 3 specimen per batch)	+20°C	-	9	-	9	9	9
Impact test at room temperature on welded joint after aging treatment (3 series with 3 specimen per batch and location: weld seam, fusion line)	+20°C	18	18	18	18	-	-
Microstructure investigation (complete weld including HAZ and base metal)	-	3	3	3	3	-	-
Hardness measurement (Vickers HV or other)	+20°C	3	3	3	3	-	-
Corrosion resistance test (DIN EN ISO 3651, ASTM G48)	-	-	-	-	3	-	-

Table 1: Overview about tests program and number of specimens (proposal), for one group of welding joints resp. one type of welding material

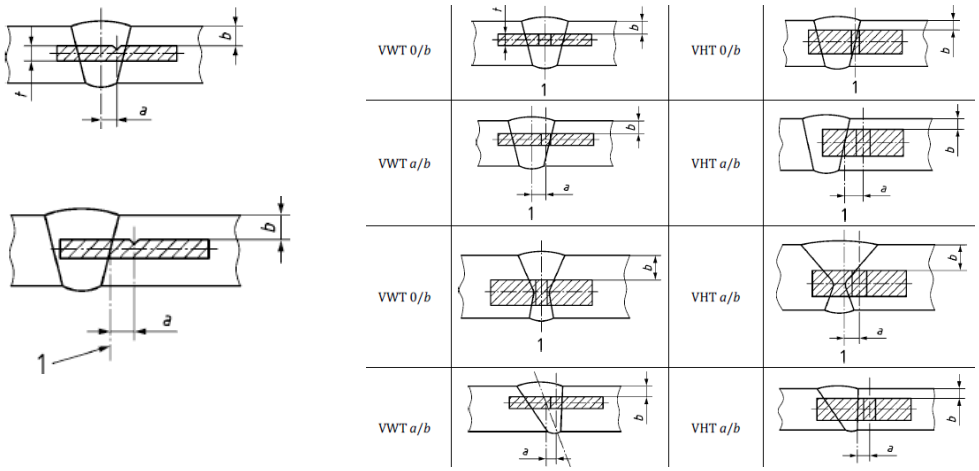
The following pictures show selected drawings of samples:



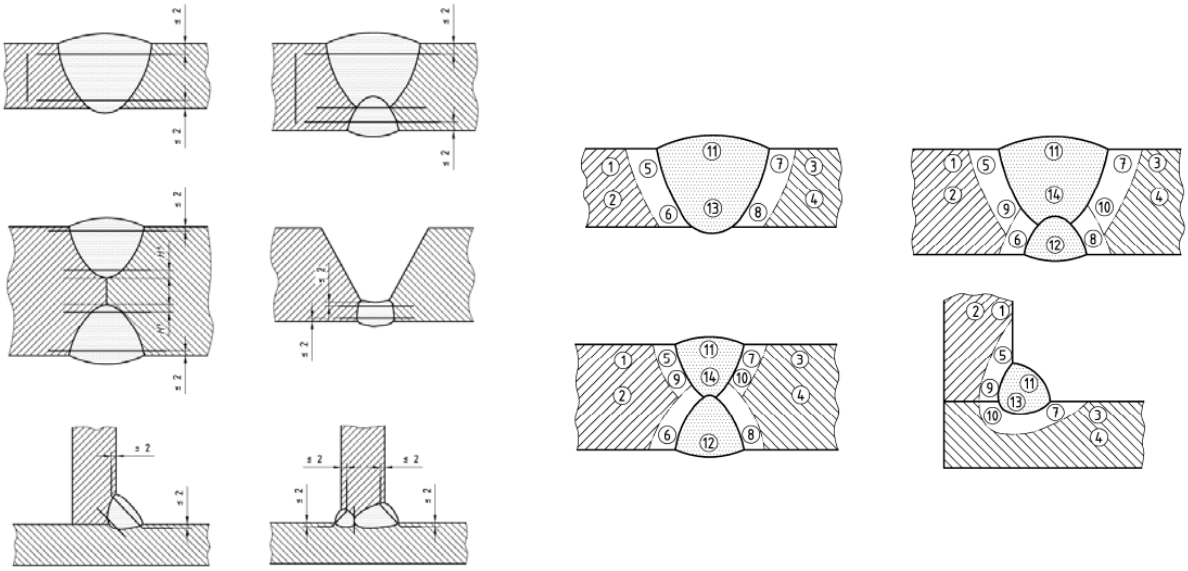
Drawing: Tensile specimen (examples), DIN EN ISO 4136



Drawing: Bend specimen (example), DIN EN ISO 5173



Drawing: Impact test specimen (examples), DIN EN ISO 9016



Drawing: Hardness test specimen (examples), DIN EN ISO 9015

The accreditations are only valid for the scope of accreditation of the testing laboratory listed in the document attachment D-PL-19424-01-00.

At all-time SPG shall be entitled to subcontract the scope of supply and service in whole or in part. The final test conditions are to be agreed between the purchaser and SPG before manufacturing and starting the tests.

4 Scope of Supply and Services of Purchaser

The purchaser is particularly obligated to the following but not limited and determined participations.

- Providing all documents being required for the investigation of the order;
- Delivery of materials (providing the materials manufactured according to GOST, welding consumables and all welded joints for testing according GOST respectively DIN EN ISO 15614-1);
- Providing a contractor for welding and control operations
- Acceptance of any import fees/customs duties that may arise.
- Collection of the test samples from the contractor or assumption of the shipping costs for the return (if necessary; not includes in the offer price);
- Information about the VAT Identification Number (ID) of purchaser.

5 Prices

Our price for the scope of supply and services specified in section 3 amounts to

Part 1: Market consultation

Costs for research, collection of information and documentation

16.500,00 €

Part 2: Material tests (see table 1)

Costs for sampling from delivered welded joints, testing, documentation

estimated price: approx.: 48.500,00 €

(has to be define after complete the test program)

Euro shall be the contractually agreed currency.

In case an additional supply or service will be agreed upon and justified between the parties and not intended after conclusion of the contract or the offer, SPG may demand an additional payment. Before transaction of additional services, the scope of service and the amount of payment have to be stipulated in written form.

6 Rules of Payment

All invoices are payable due upon receipt and the payment shall be done fourteen (14) days after receipt without reduction of cash discount and including the respective statutory VAT of 19 %.

7 Applicability and validity

This General Terms of Purchase (in the following: TP) of Siempelkamp Maschinen- und Anlagenbau GmbH are applicable on any business of supply and/or services to each purchaser (in following: Purchaser) if the Purchaser is a merchant (sec. 14 BGB - German Civil Code), governmental entity, or a special governmental estate.

As part of contracts or proposals the TP shall also apply to all supply and/or services of Siempelkamp Maschinen- und Anlagenbau GmbH affiliated and associated companies: Siempelkamp Prüf- und Gutachter-Gesellschaft mbH (SPG), Siempelkamp NIS Ingenieurgesellschaft mbH (NIS) and Siempelkamp Krantechnik GmbH (SKT), hereafter also referred as Siempelkamp Maschinen- und Anlagenbau GmbH.

Unless SPG expressly agrees, specific and/or general business terms and conditions of the Purchaser which conflict with or deviate from the TP shall not apply. The provision of supply and/or services by SPG without express reservation of rights under the TP does not imply recognition of Purchaser's business terms and conditions.

Individual Agreements with the Purchaser made case by case shall prevail to the TP. For validation of precedence the individual agreement shall be a contract or as a minimum a written affirmation of SPG.

Any declaration and notifications made by Purchaser to SPG after signing the contract (e. g. deadlines, notices of defect, termination) shall only apply if approved in writing.

The TP shall also apply to all future legal business transactions with the Purchaser involving supplies and/or services provided by SPG, even in cases in which these TP are not specifically cited. Notes to application of laws (e. g. BGB) as mentioned in the TP are only for a clarified meaning. But also, without a clarified meaning the laws shall apply if not otherwise amended or expressly excluded in the TP.

If non-compliance with the performance and delivery time is due to force majeure, the performance and delivery time shall be extended accordingly.

Force majeure ("Force Majeure") in terms of this contract shall mean any extraordinary event, which cannot be reasonably foreseen at the execution of the contract and which, despite application of all reasonable and acknowledged state-of-the-art precautions could not /cannot be reasonably avoided by the aggrieved party including but not limited to war, warlike conditions, pandemics, epidemics, embargo, boycott, exceptional weather, delivery or transport situations, strike, lock-out, etc.

8 Liability of SPG

Irrespective of the legal grounds our liability shall always be limited to the amount of the contract with a sum of 65.000,00 €. All indirect and consequential damages are excluded.

We shall also not be liable for any damage which is caused of nuclear incidents; therefore, the purchaser shall hold SPG harmless for all its own claims and claims of third person including the insurance companies. Consequently, the purchaser shall waive of all its claims against SPG.

The articles above shall also apply to our board member, legal representatives, agents, employees, factors, subcontractors or other assignees and servants.

Regarding to exclusion and limitation of liability our liability under the Product Liability Act, liability caused by intention or guaranteed characteristics of state shall remain unaffected and mandatory law shall apply.

All technical information and accepts shall only be the agreed description of completion of the scope of supply and shall in no case constitute a right of guarantee regarding to the German BGB (Bürgerliches Gesetzbuch).

9 Preliminary Milestone Plan

The performance of our scope of supply and services is currently not based on a preliminary milestone plan. The schedule of testing will be agreed between the parties after written order income and material delivery.

10 Quality assurance

As a test centre which has been approved by TÜV Industrie Service GmbH, a test laboratory which has been accredited by DAkkS GmbH according to DIN EN ISO/IEC 17025:2018, an inspection unit which has been accredited according to DIN EN ISO/IEC 17020:2012 as well as a test centre approved according to KTA 4101 we assure high quality performance of our services and absolute confidentiality with the information received during processing.

11 Confidentiality and intellectual property rights

Each Party shall maintain in strict confidence any proprietary or confidential Information and material disclosed by the other party in connection with this contract.

All information and know-how including drawings, specifications and other data provided by Purchaser in connection with the contract as well as the test results derived from the tests are the property only of the Purchaser. Any publication or disclosure of results to third party by SPG needs a written authorization of the Purchaser.

Purchaser shall have the irrevocable, royalty free and unrestricted world-wide exclusive right to use all test results in connection with this contract.

SPG warrants that the performance of the services and any deliverables and/or test works or information provided by or on behalf of SPG does not infringe any intellectual property right of a third party.

12 Applicable Law

The contract and this offer shall be governed by the civil laws of Germany excluding the Convention on Contracts for the International Sale of Goods and any other conflict rules. Exclusive place of jurisdiction for all disputes arising out of or in connection with the contract or this offer shall be Dresden (Germany).

13 Conclusion of the Contract

The purchaser is obliged to submit all information and documents required by export control and costumers' law, especially name and address of end-users and end-use certificates, specifying especially the use of the services and the country of final destination. If the purchaser does not submit these information/documents within a reasonable time set by client, the client is entitled to rescind and claim compensation for current investments from the purchaser, without obligation to pay any damages.

Delays caused by export control checks and licensing procedures by competent export control agencies will extend the delivery time and the agreed deadlines.

If required exports licenses cannot be obtained or if the contract for export control or costumer's reasons cannot be fulfilled ultimately, this supply contract is void and any related contract shall be considered as not concluded. However, the client is entitled to rescind and claim compensation for current investments from the purchaser his past expenses, if he was entitled to rely on the absence of such export control restrictions.

Any claims for compensation by the purchase in connection with the refusal or delay of export licenses or any similar export restrictions is excluded, unless such damages were caused by intention by the client. Before concluding the contract, the client will make a comparison of the name and address of the purchaser with the applicable sanction lists using screening.

Thus, the contractor fulfills his obligation under the Foreign Trade Act and the EU Anti-Terror Regulations (2580/2001/EC, 881/2002/EC and 753/2011/EC).

In the case, that the customer is mentioned of these lists, this supply contract is void and any related contract shall be considered as not concluded.

14 Correspondence and validity of Offer

Shipping address:

Siempelkamp Prüf- und Gutachter-Gesellschaft mbH
Am Lagerplatz 6 a
01099 Dresden
Germany

This offer is valid until 31 may 2025.

Siempelkamp Prüf- und Gutachter-Gesellschaft mbH

Заличено на основание ЗЗЛД

Managing director
Head of material and component testing

Head of commercial department