

AMENDMENT No. 4

to the

Contract Agreement No BIDSF-020-02-01-00

Substation Bystričany – transformation 400/110 kV, Substation Horná Ždaňa – enlargement, Substation Križovany – enlargement

Financed by

**Bohunice International Decommissioning Support Fund (BIDSF),
administered by the European Bank for Reconstruction and Development
(EBRD)**

This Amendment No. 4 to the Contract made between:

Slovenská elektrizačná prenosová sústava, a.s.

*Mlynské nivy 59/A,
824 84 Bratislava,
Slovak Republic*

IČO: 35 829 141
Tax-No.: 2020261342
VAT reg. No.: SK2020261342
Bank: Tatra banka, a.s., IBAN: SK30 1100 0000 0026 2019 1900
SWIFT: TATRSKBX
Statutory body: Board of Directors, represented by:
Ing. Miroslav Obert, Chairman of Board of Directors
Ing. Miroslav Kolník, Vice-chairman of Board of Directors
Registered: in the Commercial Register of Bratislava I District Court, Section:
Sa, Insert No.: 2906/B

Person responsible to negotiate the technical issues: Mr. Ľubomír Maco

Person responsible to negotiate the contractual issues: Mrs. Anna Szer

(hereinafter called "the Employer") of the one part

and

Association SPIE Elektrovod, a.s. – Alter Energo, a.s.

Head of the Association:

SPIE Elektrovod, a.s.

Prievozská 4C,

824 66 Bratislava 26,

Slovak Republic

IČO: 36 863 513
Tax-No.: 2022840127

VAT reg. No.: SK2022840127
Bank: Tatra banka, a.s., IBAN: SK26 1100 0000 0026 2004 0555
SWIFT: TATRSKBX
Statutory body: Board of Directors, represented by:
Ing. Milan Ferenc, PhD., Member of Board of Directors
Ing. Helena Kořanová, Member of Board of Directors
Registered: in the Commercial Register of Bratislava I District Court, Section:
Sa, Insert No.: 5058/B

(hereinafter called "the Contractor") of the other part.

Whereas:

- (A) The Engineer made determinations regarding Variations to the Contract, namely:
- i. Variation Order 04.3 resulting from Changes to the Employer's Requirements: by letter dated 10 July 2017, the Employer informed the Contractor regarding the update of its operating procedures and requested the Contractor to adapt the distance protection equipment;
 - ii. Variation Order 15 resulting from Changes to the Employer's Requirements: the Employer issued new Internal standard IS-021 in December 2017 and requested the Contractor to modify design and construction of the cable ducts and fire stops;
by the decision of Technical Committee of SEPS dated 28 June 2017, the Employer requested the unification of the short circuit withstand capacity of the 400 kV switchyard;
 - iii. Variation Order 17 resulting from the Contractor's proposal for value engineering variation of 400 kV circuit breakers upgrade.
- (B) The necessary changes resulting from the above issues need to be incorporated into the Contract provisions.

The Employer and the Contractor agree to amend the Contract through the Amendment No. 4 as follows:

1. In this Amendment No. 4 words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. This Amendment No. 4 shall supersede the Amendment No. 3, Amendment No. 2, Amendment No. 1 and the Contract Agreement.
3. The Contract Agreement shall be amended as follows:

3.1 In article 2 delete the words:

- “(a) *Amendment No. 3 including Annex 1, Annex 2, Annex 3, Annex 4 and Annex 5 to Amendment No. 3*
- (b) *Amendment No. 2 including Annex 1, Annex 2 and Annex 3 to Amendment No. 2,*
- (c) *Amendment No. 1,*
- (d) *The Contract Agreement,*
- (e) *The Letter of Acceptance, dated 20 December 2016,*
- (f) *The Letter of Tender, dated 23 September 2016,*
- (g) *The Particular Conditions of Contract,*
- (h) *The General Conditions of Contract,*
- (i) *The Employer's Requirements,*
- (j) *The completed Price Schedules, Data Sheets and Schedules of Requirements,*
- (k) *The Contractors Tender with Appendices.”*

and replace them with words:

- “(a) *Amendment No. 4 including Annex 1, Annex 2, Annex 3, and Annex 4 to Amendment No. 4*
- (b) *Amendment No. 3 including Annex 1, Annex 2, Annex 3, Annex 4 and Annex 5 to Amendment No. 3*
- (c) *Amendment No. 2 including Annex 1, Annex 2 and Annex 3 to Amendment No. 2,*
- (d) *Amendment No. 1,*
- (e) *The Contract Agreement,*
- (f) *The Letter of Acceptance, dated 20 December 2016,*
- (g) *The Letter of Tender, dated 23 September 2016,*
- (h) *The Particular Conditions of Contract,*
- (i) *The General Conditions of Contract,*
- (j) *The Employer's Requirements,*
- (k) *The completed Price Schedules, Data Sheets and Schedules of Requirements,*
- (l) *The Contractors Tender with Appendices.”*

Addenda shall have the order of precedence of the document they are modifying.

3.2 Delete text of article 4 and replace with the following text:

“The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein the amount of:

15 133 613,91 EUR

(fifteen million one hundred and thirty three thousand six hundred and thirteen Euros and ninety one Cents)

or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract. VAT and other taxes shall not be paid on the funds originating from BIDSF funds."

4. The Employer's Requirements shall be supplemented with the following:

"The Engineer's Determinations of the Approved Variations to the Contract, series III (consisting of Variation Orders 4.3; 15 and 17), as provided in Annex 1 to Amendment No. 4;

Table of the Approved Variations to the Contract, series III (consisting of Variation Orders 4.3; 15 and 17), as provided in in Annex 2 to Amendment No. 4;

The Approved Variations to the contract, series III (consisting of Variation Orders 4.3; 15 and 17), as provided in Annex 3 to Amendment No. 4;

All the above shall be duly incorporated into the Employers Requirements and shall supersede respective provisions provided therein."

5. The completed Price Schedules, Data Sheets and Schedules of Requirements shall be supplemented with the following:

"The Engineer's Determinations of the Approved Variations to the Contract, series III (consisting of Variation Orders 4.3; 15 and 17), as provided in Annex 1 to Amendment No. 4;

Table of the Approved Variations to the Contract, series III (consisting of Variation Orders 4.3; 15 and 17), as provided in in Annex 2 to Amendment No. 4;

The Approved Variations to the contract, series III (consisting of Variation Orders 4.3; 15 and 17), as provided in Annex 3 to Amendment No. 4;

Contract Price Increase Summary as provided in Annex 4 to Amendment No. 4

All the above shall be duly be incorporated into the completed Price Schedules, Data Sheets and Schedules of Requirements and shall supersede respective provisions provided therein."

6. Since Slovenská elektrizačná prenosová sústava, a.s. is the obliged person pursuant to the Slovak Act No. 211/2000 Coll. on free access to information (hereafter as "Act on free access to information") and since this legal obligation is to be fulfilled regardless of the governing law of the agreement, the Parties to this Contract are informed, that this Amendment No. 4 and related tax documents will be published as foreseen in the Act on free access to information in § 5a and § 5b for agreements, orders and invoices.
7. All other terms and conditions unaffected by this Amendment No. 4 shall remain unchanged.
8. This Amendment No. 4 is made in four counterpart originals, two of them for each part of the Contract Agreement.

In Witness whereof the parties hereto have caused the Amendment No. 4. This Amendment No. 4 becomes valid and legally binding from the day of the last party has signed it and effective from the day following the day of the publication of the Contract pursuant to § 47a section 1 of the Act No. 40/1964 Coll. (Civil Code).

SIGNED by:

Ing. Miroslav Obert
Chairman of the Board
Slovenská elektrizačná prenosová
sústava, a.s.

Date: _____
for and on behalf of the Employer

SIGNED by:

Ing. Milan Ferenc, PhD.
Member of the Board
SPIE Elektrovod, a.s.

Date: _____
for and on behalf of the Contractor

SIGNED by:

Ing. Miroslav Kolník
Vice-chairman of the Board
Slovenská elektrizačná prenosová
sústava, a.s.

Date: _____
for and on behalf of the Employer

SIGNED by:

Ing. Helena Kořanová
Member of the Board
SPIE Elektrovod, a.s.

Date: _____
for and on behalf of the Contractor

Annex 1 to Amendment No. 4

The Engineer's Determinations of the Approved Variations to the Contract, series III (consisting of Variation Orders 4.3; 15 and 17)

ENGINEER'S DETERMINATION

Project: Substation Bystričany – Transformation 400/110 kV; Horná Ždaňa Substation – Enlargement; Křižovany Substation – Enlargement

Engineer's General Comments to Contractor's Requests for Variations Orders

Contract Reference:

General Conditions of Contract (GCC) Clause 13 as amended by the Particular Conditions of Contract (PCC) Clauses 13.1 and 13.3.

List of used abbreviations:

GCC - General Conditions of Contract
PCC - Particular Conditions of Contract
DDT – Detail Design for Tendering
DDI – Detail Design for Implementation
ER – Employers Requirements
VO – Variation Order

General comments:

The Requests for Variation Orders (VO's) arose during the implementation design phase and during the execution of civil and electrical works. In most cases, the variations are based on conflicts between actual circumstances and those indicated in the Tender Documentation, or even not indicated at all.

The Engineer has checked all the submitted VO's using the following criteria:

- Eligibility of the VO, i.e. checking if the required supplies and services are covered by the Contract or not;
- Is the VO covering an additional requirement from Employer's side or is it part of the specified reconstruction works?
- Technical solution and justification of Contractor's proposal;
- Price schedules and price calculations.

When, during review of a VO, it turned out that a claim was not justified because the supplies and/or services are covered by the Contract, the VO in question was rejected and excluded from the list of VO's presented for financing.

So far, the following VO's have been approved by the Engineer and Employer and are submitted to EBRD for Non-Objection:

- VO No 04 Part 3 - ČPS 30.3 Electric protections Křižovany	€ 6.618,15
- VO No 15 Modification in Substation Křižovany	€ - 2.854,03
- <u>VO No 17 PS07 400kV switchyard – Circuit breakers upgrade</u>	<u>€ 143.560,00</u>

The total value of the above variations amounts to **€ 147.324,12**

In all cases, the prices reached during negotiations with the Contractor are considered reasonable.

After the prices agreed between the Contractor and Employer were found suitable by the Engineer (Amendment to PCC Clause 13.3), he recommends the acceptance of the Variation Orders.

These additional works are over and above the original contractual scope of work and are considered necessary from an engineering point of view as vital for the satisfactory completion of the project in accordance with the contractual time schedule. Therefore, all the justified changes caused by the construction works for this project are recommended by the Engineer as eligible.

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GOPA-International Energy Consultants GmbH

Bernard Bolton

Project Manager, Bratislava

ENGINEER'S DETERMINATION

Project: Substation Bystričany - Transformation 400/110kV; Horná Ždaňa Substation – Enlargement; Křižovany Substation - Enlargement

Individual Project 5: Křižovany Substation - Enlargement

Subject: ČPS 30.3 Electrical Protections

Engineer's Determination on Contractor's Proposal/Request for Variation Order no. 04 Part 3

Contract Reference: GCC Clause 13 [Variations and Adjustments] as amended by PCC Clauses 13.1 and 13.3.

Variation Classification: Changes to the Employer's Requirements

Reason: The Employer has amended Employer's Requirements; Operation Procedures – in order to ensure safe operation, the adoption of the distance of protection equipment was requested

Rationale/Brief Description:

By letter dated 10 July 2017, the Employer informed the Contractor that the Employer had updated its Operation Procedure PI no. 933-7-2 as well as related internal standards and requested the Contractor to modify the distance protection equipment from that originally defined in the Employer's Requirements.

The update of the Employers Operation Procedure PI no. 933-7-2: "Renovation of Power Transmission System of Slovak Republic" results into the requirement to add a 3rd W3 busbar into the substation. The Operation Procedures provided during the tendering process and at the time DDT was prepared and/or contract was signed, defined operation of substations with 2 busbars. The update of the Operation Procedures was necessary due to power system requirements (higher demands for power transmission) which require substations to have 3 busbars to ensure readiness of the equipment for operation. Such requirement provides more options for manipulation of 400kV equipment (i.e. switching 400kV bays, distributing load over the busbars, creation of independent power supply, outages, maintenance options) higher safety of power supply from important sources to consumption, better possibilities for maintenance. Operation of substation with 3 busbars creates more signals and commands (inputs, outputs, signalling) received or sent by protection devices.

Each distant protection device therefore shall be modified as follows (differences between DDI and DDT):

- The module 1x IO208 shall be added,
- The module 2xIO205 without LED shall be replaced with 2 modules IO207 with LED signalling,
- The module 2xIO207 with LED signalling shall be added,
- 125FB shall be added.

As a result, by letter dated 23 July 2017, the Engineer instructed a Variation requesting the Contractor to prepare a proposal for Variation according to GCC Clause 13 [Variations and Adjustments]. The Contractor presented the first draft of his Proposal for Variation (Variation Order No. 04 Part 3), on 8 August 2017. Following review and scrutiny of the Proposal by the Engineer and subsequent determinations in accordance with the provisions of PCC 13.3, the Contractor prepared an updated version of the Variation Order no.04 Part 3 "ČPS 30.3 Electrical Protection" and submitted to the Engineer on 30 June 2018 (Annex 1) for its final review and approval.

The price under the Contract for the originally envisaged scope was €13.246,00 and the revised estimate as per the Contractor's Proposal is €19.549,00 (price breakdown as proposed by the Contractor is included in Annex 1 "Variation Order no.04 Part 3 ČPS 30.3 Electrical Protection"), this increase of cost for the scope is **€6.303,00**.

In accordance with the provisions of Clause 13.3 [Variation Procedure], the adjustments to a Contract Price shall also include reasonable profit as defined in PCC 1.2, therefore the amount of €315,15 representing 5% profit from the cost of the increased scope is calculated.

Eligibility:

The Employer/Engineer found the variation eligible for application under GCC clause 13 [Variations and Adjustments], since this solution ensures the Employer's compliance with the power system requirements and falls within the provisions of GCC clause 13.2, namely item (ii) reduces cost of maintenance and item (iii) provides improvement to the efficiency and value to the Employer,

Conclusion / Recommendation:

The technical documentation provided as per to Variation Order No 04 Part 3 and describing the modification of the distant protection system is compliant with the Employer's updated Operating Procedures and has been checked, approved and found eligible under GCC Clause 13 [Variations and Adjustments] by the Employer/Engineer.

Following the acceptance of the final technical solution, the Engineer checked the cost proposal submitted by the Contractor. In determining the cost of this Variation, all additions / deductions to the scope were valued at the rates and prices set out in the Contract (Price Schedule), and, where necessary, from other reliable sources (namely, UNIKA 2018 price list). Costs are summarised in the table below:

Calculations for Variation no.4.3:

The Engineer considers the price adjustment agreed between the Contractor and Employer is adequate, and, as the additional works will reduce the cost of maintenance and provide improvement to the efficiency and value to the Employer as well as will ensure safe operation of the facility, the Engineer, therefore, recommends acceptance of the Proposal/Request for Variation Order no. 04 Part 2 as eligible, with the total additional value of **€ 6.618,15**.

Bernard Bolton
Project Manager Bratislava

Annexes:

1. Variation order no.04.3 ČPS 30.3 Electrical Protections

ENGINEER'S DETERMINATION

Project: Bystričany Substation - Transformation 400/110kV; Horná Ždaňa Substation – Enlargement; Križovany Substation - Enlargement

**Engineer's Determination on Contractor's Proposal for the Variation Order no. 15
Subject: SO369 Firestops, SO522 400kV Switchyard, SO525 Cable Ducts, PS07 400kV Switchyard**

Individual Project 1: Križovany Substation - Enlargement

Contract Reference: GCC Clause13 [Variations and Adjustments] as amended by PCC Clauses 13.1 and 13.3.

Variation Classification: Change of the Scope of Work requested by the Employer subject to GCC Clause 13.1 [Right to Vary]

Reason: The Employers Requirements were amended due to:

1. the Incorporation into the Employer's Requirements of the Employer's request to change the scope of works based on the Employer's Technical Committee decision on unification of short circuit withstand capacity from 50kA to 40kA in Križovany substation, dated 28 June 2017; resulting that the original scope of work was reduced by the construction of intermediate gantry in bay ACA14.
2. the Incorporation into the Employer's Requirements of a new SEPS Internal Standard IS-021: "Requirements for New Cable Ducts dated 22 December 2017".

Rationale/Brief Description:

1. Originally the Employers requirements defined the switchyard short withstand capacity of 50kA and included construction of the intermediate gantry. During the project implementation of bay ACA 14 in Križovany substation, the technical committee of SEPS issued a decision on unification of short circuit conditions, in particular short circuit withstand capacity, from 50kA to 40kA in the Križovany 400kV switchyard substation on 28 June 2017. The decision was based on the short circuit conditions (40kA) in existing bays ACA 01-13.

Due to this decision, the original scope of work in the Employer's requirements was reduced by the construction of the intermediate gantry in bay ACA14 and modification of the 400kV substation foundations. Planned costs of the intermediate gantry construction are reflected in Price Schedules S522 400kV Switchyard and PS07 400kV Switchyard.

2. The Internal Standard IS-021: "Requirements for New Cable Ducts" (attached hereto as Annex 2) is introduced in order to ensure safe and reliable operation of substations through unification of standards at all substations owned by SEPS (the Employer). It defines minimum requirements for new surface cable ducts and describes their construction and technical execution within the following scope: cable ducts, cable conduit (pipeline), cable trays, cable draw pits, fire measures, water sealing and water discharge. The standard requires cable ducts to be accessible

from the surface and requires outlets from cable ducts to be executed in the form of cable conduits (pipelines). This standard must be applied:

- a) during construction of new substations owned by SEPS (the Employer);
- b) during complex reconstructions of substations owned by SEPS (the Employer),
- c) during construction or complex reconstructions of cable ducts owned by SEPS (the Employer).

The new Standard IS-021 was not available at the time of preparation of the DDT and, accordingly, at the time of concluding the Contract and therefore, was not included in Employers Requirements. However, after the issue of the new Standard IS-021 in December 2017, it became necessary to ensure that the extension of Križovany 400kV substation follows the new requirements identified therein. The technical solution described in the DDT did not envisage the new requirements of SEPS IS-021: "Requirements for New Cable Ducts" and thus the following modifications were requested:

- a) transfer of cable ducts to be designed through shaft's wall with sewerage PVC pipeline;
- b) The angle of cable ducts to be designed with segment pipeline;
- c) The depth of cable shafts, mass of concrete under shafts and concrete class to be changed;
- d) The cable end to cable end RSN4 with frame to be changed and modules Roxtec, for earthing to be designed;
- e) The reconstruction of existing cable channel to be designed;

Planned costs of the implementation of the SEPS internal standard IS-021 are reflected in Price Schedules SO369 Fire stops and SO525 Cable routes.

At the Employer's request, and based on the requirements for implementation of the SEPS technical committee decision and for the implementation of Internal Standard IS-021 imposing modification to the design and construction of the cable ducts under the Project, the Engineer, by letter dated 15 January 2018 instructed the Contractor to prepare the Variation Proposal according to GCC Clause 13, Variations and Adjustments.

The Contractor presented his proposal (Variation Order No. 15), first draft version, on 11 February 2018, where the design of new solution of the 400kV substation (without intermediate gantry) and implementation of the SEPS Internal Standard IS-021 were updated in parallel. The Contractor's designer prepared the technical solution that composed both issues to the modified version of the DDI. Based on the updated DDI the Contractor prepared the update to the Price Schedules.

Following scrutiny and review of the Proposal by the Engineer and subsequent determinations in accordance with the provisions of PCC 13.3, the Contractor prepared an updated version of Variation Order no.15 "Omission of intermediate gantry" and submitted it to the Engineer on 17 October 2019 (Annex 1) for its final review and approval.

The price under the Contract for the original scope of SO522 400kV Switchyard and PS07 400kV Switchyard was €913.409,15 and the revised estimation as per the Contractor's Proposal is €843.041,60.

The price under the Contract for the original scope of SO369 Fire stops and SO525 Cable ducts was €25.730,72 and the revised estimation as per the Contractor's Proposal is €93.244,24.

Therefore, the price under the Contract for the original scope of SO522 400kV Switchyard, PS07 400kV Switchyard, SO369 Fire stops and SO525 Cable ducts was € 939.139,87 and the revised estimation as per the Contractor's Proposal is € 936.285,84. Thus, the total decrease of cost for the scope is €2.854,03. The price breakdown is stated below in the Calculations for Variation no.15.

Eligibility:

Due to the fact that the Employer introduced the new Standard and thus changed the Employer's Requirements after the Contract was signed, the Employer/Engineer found the variation eligible for application under GCC Clause 13 [Variations and Adjustments], and instructed the Contractor to prepare the Proposal for Variation.

Conclusion / Recommendation:

The technical documentation submitted by the Contractor as part of the Proposal/Request for Variation Order no.15 has been checked, approved and found eligible under GCC Clause 13 by the Employer/Engineer

Following the acceptance of the final technical solution, the Engineer checked the cost proposal submitted by the Contractor. In determining the cost of this Variation, all deductions/additions to the scope were valued at the rates and prices set out in the Contract (Price Schedules), and, where necessary, from other reliable sources (namely, UNIKA 2018 price list).

Calculations for Variation no.15:

The Engineer considers that the price adjustment agreed between the Contractor and Employer is adequate, and, as the additional works are considered necessary for the satisfactory completion of the project, the Engineer therefore recommends acceptance of the Proposal for Variation Order no.15 as eligible, in the amount of € -2.854,03.

Bernard Bolton
Project Manager Bratislava

Annexes:

1. Variation order no.15
2. SEPS Internal Standard IS-021: "Requirements for New Cable Ducts dated 22.12.2017

ENGINEER`S DETERMINATION

Project: Substation Bystričany - Transformation 400/110kV; Horná Ždaňa Substation – Enlargement; Křižovany Substation - Enlargement

Engineer's Comment to Contractor's Request for Variation Order no. 17

Subject: PS07 400kV Switchyard – 400kV Circuit Breaker upgrade

Individual project 1: Substation Bystričany - Transformation 400/110kV

Contract Reference: GCC Clause13 [Variations and Adjustments] as amended by PCC Clauses 13.1, 13.2 and 13.3.

Variation Classification: Contractors proposal according to GCC13.2

Reason: to reduce costs of operation and maintenance of Works (GCC 13.2 (ii)) and to improve efficiency and value to the Employer of the completed Works (GCC 13.2 (iii)).

Rationale/Brief Description:

During the implementation of the project, the Contractor, on 15 January 2019, suggested an improvement of 400kV circuit breakers in Bystričany substation, by providing the Engineer with a written proposal. The original Employers requirements required the Contractor adequately to account for the space requirements and road clearance requirements defined for substations and thus by definition the Circuit breaker construction was designed and installed by the Contractor at height in accordance with STN EN 62 271-1 and STN EN 33 2000-5-53 which is accessible from the ground however only by using work at height equipment only.

The Contractors written proposal highlighted the inadequacies associated with the height of the circuit breaker's motor-drive cubicle: even though that at this height the cubicle is accessible for operation and maintenance, nevertheless such placement of a circuit motor drive will make standard work procedures very difficult and costly.

Additionally, the originally envisaged height for motor drive will drastically impede the access to the circuit breaker's motor-drive due to the access restrictions and will increase the response time of the management of an emergency event such as crisis management, black out events, which have to be responded within shortest possible time.

Further, the current installed position of circuit breaker's motor-drive cubicle, will require the delivery of the special platforms to any of the 12 locations to enable personnel to access the circuit motor drive and to remedy the emergency event. The utilisation of such a platform will increase the risk of injury of the maintenance / operation workers working at these heights.

Due to the above highlighted concerns the Contractor, in accordance with GCC 13.2 (ii) and (iii), provided a written proposal to the Engineer to improve the design issues associated with the height of the circuit breakers motor drive cubicle.

Please refer to the Eligibility section, below, for further details relating to future cost reductions in operation and maintenance of Works and for the improved efficiency of the completed Works.

The initial Contractor's proposal was presented to the Engineer on 15 January 2019 and was extensively considered / discussed by the Engineer, Employer and the Contractor. Following these considerations / discussions, on 9 of April 2019, the Engineer requested the Contractor to further elaborate three possible solutions. The Contractor, on 20 May 2019, provided the requested technical details and on 4 June 2019 provided his assessment of the financial impact of the proposed improvements under these 3 solutions. The Contractor submitted its proposals for the 3 solutions to the Employers technical committee; who is the only entity in Slovak Republic that may authorise the modification of already approved substation design. The technical committee concluded that the replacement of the bottom insulator, trigger rod and support steel structure presented by the Contractor in the proposed solution No. 3 is the most viable. The Technical Committee approved the proposed solution No.3 on 19 July 2019. Based upon this decision the Contractor presented their final proposal for Contract Variation Order No.17 on 12 August 2019 for an amount of €143,560.00.

The price under the Contract for the originally envisaged scope was € 2,798,009.64 and the revised estimate as per the Contractor's Proposal is €2.941.569,64 (price breakdown as proposed by the Contractor is included in Annex 1 "Variation Order no.17 – PS07 400kV – Circuit Breaker upgrade"), this represents an increase in the total Contract Price of **€ 143.560,00**.

Eligibility:

The Engineer concluded that the variation is eligible for application under GCC clause 13 [Variations and Adjustments], since this solution ensures the Employer's compliance with the power system requirements and falls within the provisions of GCC clause 13.2, namely item (ii) reduces cost of maintenance and operation as follows:

- As the new higher surface insulation path (31,5mm/kV in comparison with the original envisaged 25 mm/kV) will extend the required maintenance intervals (cleaning) from 3 months (currently envisaged) to 1 year which is also in line with electrical installation standard STN EN 33 2000-5-53.
- The increase of the circuit breaker insulation surface path from originally envisaged 25mm/kV to 31,5mm/kV will place the motor drive cubicle into the level accessible from the ground and thus will decrease the response time of the operation/maintenance personnel;
- Motor drive cubicle will be accessible from the ground (bottom edge in height of 752 mm – compliance with technical standard STN EN 33 2000-5-53).
- Easy access in case of dealing with critical activities (crisis management in case of unforeseen circumstances, remedy actions, emergencies) – shortens access and remedy time as no delivery and installation time for the platform will be needed to enable personnel to access the cubicle;
- Increases the safety of the workers – no work at heights required and thus no specific authorisations / certifications will be required from the personnel

and item (iii) provides improvement to the efficiency and value to the Employer,

- The increase of the circuit breaker insulation surface path from originally envisaged 25mm/kV to 31,5mm/kV will improve operational safety of the substation due to the increased insulation path
- The solution will enable unification of the layout with the future bays which SEPS will have to undertake in order to comply with the standards of the Slovak Republic and which the current layout did not encompass.
- No modification to the tubular conductor – the proposed straight tubular busbar conductor provides a better transfer and attenuation of the dynamic forces caused by circuit breaker switching or short circuit forces.
- Road clearance height remains at 3700mm which allows unrestricted access of maintenance vehicles through the live substation.
- Road width remains unchanged at 3500mm

The presented and chosen solution has no known or identified disadvantages.

Conclusion / Recommendation:

The technical documentation provided as per to Variation Order No 17 and describing the modification of the 400kV Circuit breaker is compliant with the conclusions and recommendations of the Employer's Technical Committee and has been checked, approved and found eligible under GCC Clause 13 [Variations and Adjustments] by the Employer/Engineer.

Following the acceptance of the final technical solution, the Engineer checked the cost proposal submitted by the Contractor. In determining the cost of this Variation, all additions / deductions to the scope were valued at the rates and prices set out in the Contract (Price Schedule), and, where necessary, from other reliable sources (namely, UNIKA 2018 price list). Costs are summarised in the table below:

Calculations for Variation no 17:

The Engineer considers the price adjustment agreed between the Contractor and Employer is adequate, and, as the additional works will reduce the cost of maintenance and provide improvement to the efficiency and value to the Employer as well as will ensure safe operation of the facility, the Engineer, therefore, recommends acceptance of the Proposal/Request for Variation Order no. 1 as eligible, with the total additional value of **€ 143.560,00**.

Bernard Bolton
Project Manager Bratislava

Attachments:

1. Circuit breaker construction
2. Updated financial proposal for Variation Order 17
3. Variation order no.17 PS07 400kV Switchyard

Annex 2 to Amendment No. 4

**Table of the Approved Variations to the Contract, series III
(consisting of Variation Orders 4.3; 15 and 17)**

Annex 2 to Amendment No. 4

Project: Substation Bystričany - transformation 400/110 kV / Rozvodňa 400 kV Bystričany
Substation Horná Ždaňa - enlargement / Rozvodňa 400 kV H. Ždaňa - rozšírenie
Substation Križovany - enlargement / Rozvodňa 400 kV Križovany - rozšírenie

**Table of the Approved Variations to the Contract, series III/
Tabuľka schválených zmenových návrhov, séria III**

No. / č.	Title / Názov	Price / Cena
		EUR
Variation Order No. 4.3	ČPS 30.3 Electric protections, Križovany / ČPS 30.3 Zmena špecifikácie elektrických ochrán, Križovany	6 618,15
Variation Order No. 15	Modifications in Substation Križovany / Úpravy v Est Križovany	-2 854,03
Variation Order No. 17	PS 07 Rozvodňa 400 kV - Vylepšenie vypínača 400 kV, Bystričany / PS 07 400 kV Switchyard - 400 kV circuit breaker upgrade, Bystričany	143 560,00
Total – Approved Variations to the Contract, series III / Spolu – Schválené Zmenové návrhy, séria III		147 324,12 €

Annex 3 to Amendment No. 4

**The Approved Variations to the contract, series II (consisting of
Variation Orders 4.3; 15 and 17)**



Complex ES Bystričany – Transformation 400/110kV

Rozvodňa Križovany– enlargement

Variation Order no. 4.3 – ČPS 30.3 Electric protections Križovany

Created by Ing. Bálint

Checked by Ing. Pastefák

Approved by Ing. Szombath

Contract	Document No.	Date
22 16 112		06 / 2018

Release	Status	Copy
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Obsah

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5. Financial summary	4
6. Completion Date Impact	5
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1. Identification data

Construction:	Substation Križovany – Enlargement
Site location:	400kV Substation Križovany region: Trnavsky district: Trnava village: Križovany nad Dudváhom cadastral area: Križovany nad Dudváhom
Employer:	Slovenská elektrizačná prenosová sústava, a. s. Mlynské Nivy 59/A 824 84 Bratislava Slovak Republic
Operator:	Slovenská elektrizačná prenosová sústava, a. s. Mlynské Nivy 59/A 824 84 Bratislava Slovak Republic

2. Reasons for the Variation

During preparation of detail design for implementation of substation Križovany – enlargement electrical part ČPS30.3 Electric protection, some we found insufficiencies in secondary distance protection requirements.

We found that required parameters of the secondary distance protection in the Table of Technical Specifications (hereinafter referred to as TTS) states insufficient number of protection functions, analogue inputs, binary inputs and outputs to adapt Employers additional requirement of future operations of the substation with 3 main busbar systems in comparison with Tender Documents where specification of busbar protection settled to substation with 2 busbar systems only.

Requested parameters of distance protection according to TTS:

- Analogue inputs: 4xI,5xU,
- Binary inputs and outputs: 30BI, 35BO
- Protection functions in the scope of 225FB,
- Signal LED – 15 pieces
- Communication IEC 61850 optic.

Parameters of distance protection offered in the tender:

- Analogue inputs: 8xI,8xU,
- Binary inputs and outputs: 31BI, 37BO

- Protection functions in the scope of 225FB,
- Signal LED – 16 pieces
- Communication IEC 61850 optic.

3. Reasoning

With regard to the found out facts related to adding of bus bar W3, we as the responsible designer, proposed the solution reflecting the aforementioned adverse findings. We propose such parameters of the protection that will fully comply also after adding the bus bar W3 and related instrumentation. If change of protection is required, it will be possible to change settings of the protection without any additional costs for hardware and software.

Since digital protections fulfil an important function at protection of equipment, reliability of operation, minimise duration of adverse impacts on the equipment, switch off only a failed section, and ensure continuous supply of energy in undamaged parts of the grid, we propose to increase the considered parameters.

We propose the change of parameters in compliance with FIDIC – *Conditions of Contract for Plant And Design-Build Contract*, Clause 13.2.

Proposed parameters of distance protection:

- Analogue inputs: 8xI 8xU
- Binary inputs and outputs: 63BI, 44BO
- Protection functions in the scope of 350FB,
- Signal LED – 80 pieces
- Communication IEC 61850 optic

4. Variation description

Differences between DDI and DDT are as follows:

- Replace the module 1xIO214 with module IO208,
- Replace the module 2xIO205 without LED with 2 modules IO207 with LED,
- Replace the module 2xIO206 without LED with 2 modules IO207 with LED,
- Add the module 2xIO207 with LED,
- Add 125FB.

The variation of specification relates to 1 piece of distance protection.

5. Financial summary

Detail budget and bill of quantity (BoQ) is attached to this document.

- a) Original budget BoQ from Tender – Annex No. 1.
- b) DDI Budget and BoQ – Annex No. 2.

c) Comparative Budget and BoQ DDI-TD – Annex No. 3.

Financial summary for the electric system – ČPS 30.3 Electric Protection Križovany:

Variation order budget costs:	114.854,15 EUR
<u>Original budget BoQ from Tender:</u>	<u>-108.551,15 EUR</u>
Costs difference:	6.303,00 EUR
<u>Reasonable profit according to PCC 1.2 (5% of costs difference):</u>	<u>315,15 EUR</u>
Variation order no. 4.2 – total costs	6.618,15 EUR

6. Completion Date Impact

This Variation does not influence overall completion date.

7. Attachments

Attachment no. 1 – Preliminary approval by Managing Director of Division of Development and Investment, SEPS

Attachment no. 2 – Original budget BoQ from Tender ES Križovany CPS30.3

Attachment no. 3 – DDI Budget and BoQ for proposed solution ES Križovany CPS30.3

Attachment no. 4 – Comparative Budget and BoQ DDI-TD ES Križovany CPS30.3

Attachment no. 5 – Specification 7SA87_P1A146719_Kriz

Attachment no. 6 – Approval of general designer

Attachment no. 7 – Approval of SEPS operator, e-mail dated 10/07/2017

Attachment no. 8 – TTS of the second distance protection of line

Attachment no. 9 – Placing of binary inputs and outputs of the second distance protection

Attachment No.1

Preliminary approval by Managing Director of Division of Development and Investment,
SEPS

Vec : Vydanie predbežného súhlasu na zmenu špecifikácie druhého ochranného terminálu – dištančná ochrana

Vážený pán vrchný riaditeľ,

dovoľujeme si Vás požiadať o vydanie predbežného súhlasu na zmenu špecifikácie druhého ochranného terminálu – dištančná ochrana, ktorá sa realizuje v Rozvodni 400 kV Bystričany, Rozvodni 400 kV H. Ždaňa – rozšírenie a v Rozvodni 400 kV Križovany – rozšírenie, ako súčasť stavby „Súbor stavieb Bystričany – transformácia 400/110 kV“. Nakoľko je v požiadavkách objednávateľa chybný počet binárnych vstupov a výstupov druhého ochranného terminálu – dištančnej ochrany, Objednávateľ požiadaval navýšiť počet vstupov a výstupov z pôvodných 24 vstupov a 35 výstupov na vyhovujúci počet 48 vstupov a 48 výstupov. Nová realizačná dokumentácia pre dištančnú ochranu bola prerokovaná a odsúhlasená prevádzkovateľom (SEPS) a s generálnym projektantom VUJE, a.s. Zhotoviteľ vypracoval nový rozpočet a vyčíslil jednotlivé položky navyše prác, viď Prílohu 1 Rozpočtové náklady a 2 Výkaz výmer. Celková cena diela je vyššia o 38 268,00 € bez DPH. Touto zmenou nevzniká žiadny dopad na termíny, či stavebné a územné konania. Týmto Vás v zmysle SM 09/2009 Prílohy D časť B, bod 3 žiadame vydať predbežný súhlas so zmenovým konaním – viď Prílohu č. 9.

Za kladné vybavenie tejto žiadosti Vám vopred ďakujeme.

S pozdravom,

RNDr. J. Juraj Došek
vedúci samostatného odboru investícií

- Prílohy: 1, Rozpočtové náklady,
2-3, Výkaz výmer,
4, Špecifikácia zariadenia,
5, Špecifikácia zariadenia,
6, Súhlas generálneho projektanta,
7, Súhlas prevádzkovateľa SEPS,
8, Žiadosť zhotoviteľa na realizáciu zmeny,
9, Návrh textu predbežného súhlasu so zmenovým konaním.

**Vydanie predbežného súhlasu na zmenu špecifikácie druhého ochranného terminálu –
dištančná ochrana v Rozvodni 400 kV Bystričany, Rozvodni 400 kV H. Ždaňa –
rozšírenie a v Rozvodni 400 kV Križovany – rozšírenie.**

Na základe predloženej realizačnej dokumentácie a potrebných súhlasov a vyjadrení o jej prerokovaní vydávam v zmysle SM 09/2009 Prílohy D časť B, bod 3

predbežný súhlas

na zrealizovanie **zmeny špecifikácie druhého ochranného terminálu s celkovým
navýšením ceny stavby o 38 268,00 € bez DPH.**

Súčasne ukladám v zmysle ZoD 2016-0295-1177501, podpísanej dňa 6. február 2017,
vypracovať Dodatok č.1 k tejto ZoD pre zmenu špecifikácie druhého ochranného terminálu –
dištančná ochrana.

V Bratislave dňa 9.8.2017

Ing. Miroslav Stejskal
vrchný riaditeľ úseku rozvoja a investícií

Issuance of the preliminary approval to change of the specification of the second protective terminal - distance protection – all substations

On the basis of the submitted implementation dossier and the necessary consents and statements of its deliberation, I issue, pursuant to SM 09/2009, Annex D, Part B, point 3, I issue the

preliminary approval

to realize the change of the specification of the second protective terminal - distance protection

with a total increase of the construction price by 38 268,00 € excluding VAT.

At the same time, I impose, in the sense of the Contract for Works 2016-0295-1177501, signed on February 6, 2017, to prepare Amendment No.1 to this Contract to change the implementation of the Earthworks.

In Bratislava, 9.8. 2017

Ing. Miroslav Stejskal
Managing director for the Investment section

Attachment No.2

Original budget BoQ from Tender ES Križovany CPS30.3

Attachment No.3

DDI Budget and BoQ for proposed solution ES Križovany CPS30.3

Attachment no. 4

Comparative Budget and BoQ DDI-TD ES Križovany CPS30.3

Attachment No.5

Specification 7SA87_P1A146719_Kriz

Attachment No.6

Approval of general designer

Príloha č.6-stanovisko GP ku ZK-04 PS30: 2.ochranný terminál Siemens

From: Michal.Dekys@vuje.sk [mailto:Michal.Dekys@vuje.sk]

Sent: Tuesday, July 11, 2017 9:01 AM

To: lubor.melovic@alterenergo.sk

Subject: RE: 170616 Complex Bystricany - Substation 400 kV Bystričany - zmena špecifikácie ochrán Siemens

Ahoj,

S požadovanou zmenou špecifikácie druhého ochranného terminálu súhlasíme, nakoľko parametre po zmene sa zhodujú z požiadavkami ktoré sme uvádzali v TTS nášho projektu. Len pripomínam že požadovanú zmenu musí schváliť aj investor.

Michal Dekys

Odoslané z môjho smartphonu Sony Xperia™

---- Ľubor Melovič píše ----

Ahoj Michal

Na základe nášho telefonického dohovoru, ťa prosím o **vyjadrenie zмене** špecifikácií druhého ochranného terminálu - dištančnej ochrany a zмене rozdielovej ochrany prípojnic samostatne. S pozdravom

Ľubor Melovič

projektový manažér stavieb

Alter Energo, a.s.

Hlavná 561, 951 78 Koliňany

Mob.: +421 915 793 520

@: lubor.melovic@alterenergo.sk

 Myslíte na prírodu ... Skutočne potrebujete vytlačiť tento e-mail?

Attachment No.7

Approval of SEPS operator, e-mail dated 10/07/2017

e-mail 10.7.2017:

Pekný deň prajem,

ako doplnenie e-mailu z 14.6.2017, preposielam schválenie špecifikácie ochrán (Ing. Podmanický).

S pozdravom

Peter Merschitz

Príloha: 1 súbor
Marian.Podmanicky@sepsas.sk

Od: Podmanický Marián <Marian.Podmanicky@sepsas.sk>

Odoslané: 6. júla 2017 16:42

Komu: Merschitz, Peter; Došek Juraj

Predmet: FW: Complex Bystricany - Substation 400 kV Bystričany - zmena špecifikácie ochrán Siemens

Dobrý deň,

znovu posielam vyjadrenie k technickej špecifikácii ochrán Siemens. Priložené špecifikácie sú vyhovujúce.

Zo zmenou typu ROP z Siemens na ABB súhlasíme.

S pozdravom

Marián Podmanický

From: Podmanický Marián

Sent: Tuesday, June 20, 2017 2:37 PM

To: Došek Juraj (Juraj.Dosek@sepsas.sk) <Juraj.Dosek@sepsas.sk>

Subject: FW: Complex Bystricany - Substation 400 kV Bystričany - zmena špecifikácie ochrán Siemens

Dobrý deň,

špecifikácie navrhnuté projektantom sú vyhovujúce.

S pozdravom

Marián Podmanický

From: Matej Bjalončík [<mailto:matej.bjaloncik@alterenergo.sk>]

Sent: Monday, June 19, 2017 1:19 PM

To: Podmanický Marián <Marian.Podmanicky@sepsas.sk>

Cc: lubor <lubor.melovic@alterenergo.sk>

Subject: Complex Bystricany - Substation 400 kV Bystričany - zmena špecifikácie ochrán Siemens

Dobrý deň,

Chcel by som Vás poprosiť o odsúhlasenie zmeny špecifikácie ochrán Siemens pre akciu Complex Bystričany:

V TTŠ je v požiadavkách objednávateľa chybné uvedení počet binárnych vstupov a výstupov druhého ochranného terminálu - dištančnej ochrany. Objednávateľ požaduje počet vstupov a výstupov navýšiť - požaduje min. 48 vstupov a 48 výstupov (oproti TD 24 vstupov a 35 výstupov)

Z tohto dôvodu je potrebné zmeniť finálnu špecifikáciu ochrán Siemens 7SA87 s vyhovujúcim počtom vstupov a výstupov – presná špecifikácia ochrany odsúhlasená SEPSom je v prílohe. Zmena špecifikácie ochrán sa jedná pre stavby *Bystričany – 3ks, Horná Ždaňa – 2ks a Križovany – 1ks ochrán.*

Presná špecifikácia ochrán je v prílohe.

Dané riešenie má vplyv na cenu, nemá vplyv na termín realizácie.

Ďakujem

Ing. Matej Bjalončík
Projektant

tel.: +421 918 743513

email: matej.bjaloncik@alterenergo.sk



Upozornenie:

Tento e-mail a jeho prílohy môžu obsahovať dôverné informácie! Akékoľvek neoprávnené rozšírenie alebo použitie obsahu je prísne zakázané. Ak ste dostali tento e-mail omylom, upozornite prosím odosielateľa a vymažte ho z Vášho systému. Odosielateľ neprijíma zodpovednosť za žiadne chyby pri prenose e-mailu ani za stratu alebo škodu spôsobenú jeho prijatím alebo použitím. Bitte, prosím, eliminujte zbytočné platiťedie a zvážte potrebu úče tohto e-mailu.

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Attachment No.8

TTS of the second distance protection of line

Attachment No.9

Placing of binary inputs and outputs of the second distance protection



Complex ES Bystričany – Transformation 400/110kV

Substation Križovany - enlargement

*Variation Order no. 15 - part enlargement SO369, SO522, SO525
- part PS07 Substation 400kV omission of
intermediate gantry*

Created by **Ing. Kurpaš**

Checked by **Ing. Pastelák**

Approved by **Ing. Szombath**

<i>Contract</i>	<i>Document No.</i>	<i>Date</i>
222 16 112		09/2019

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6. Completion Date Impact	7
7. Attachments	7

1. Identification data

Construction:	Substation 400 kV Križovany - enlargement
Site location:	Electric Station 400 kV Križovany region: Trnavsky kraj district: Trnava village: Križovany cadastral area: Križovany
Employer:	Slovenská elektrizačná prenosová sústava, a. s. Mlynské Nivy 59/A 824 84 Bratislava Slovak Republic
Operator:	Slovenská elektrizačná prenosová sústava, a. s. Mlynské Nivy 59/A 824 84 Bratislava Slovak Republic

2. Reasons for the Variation

Part enlargement SO369, SO522, SO525

SO 369 Fire-stops

During preparation of the detail design for implementation (DDI), based on the requirements of the Employer – SEPS a.s. Bratislava standards, to include Internal Standard IS-021, where is required to terminate cable routes in bays by frame fire stops Roxtec in contradiction to DDT where ordinary fire stop was required. Complete specification, design and technical solution is included SO 369 Fire-stops.

SO 522 Substation 400 kV

During preparation of the detail design for implementation (DDI), based on the requirements of the Employer – SEPS a.s. Bratislava standards, to omit intermediate gantry, which appears to be unnecessary due to update of the short circuit requirements in bay ACA14 by SEPS technical committee. Below described measures have been taken.

SO 525 Cable channels

During preparation of the detail design for implementation (DDI), based on the requirements of the Employer – SEPS a.s. Bratislava standards, to include Internal Standard IS-021.

PS07 Substation 400 kV

During preparation of the detail design for implementation (DDI), based on the requirements of the Employer – SEPS a.s. Bratislava standards, to omit intermediate gantry, which appears to be unnecessary due to update of the short circuit requirements in bay ACA14 by SEPS technical committee. Below described measures have been taken.

3. Reasoning

Part enlargement SO369, SO522, SO525

SO 369 Fire-stops

Due to implementation of SEPS internal standard IS-021, new passages through the existing cable channel were designed by ROXTEC sealing modules. As required by the standard also bay termination were made by RSN4 cable termination (SO525) with ROXTEC sealing modules specified herein. Detail description of modification is included in DDI – SO369 Fire stops.

SO 522 Substation 400 kV

Detail design for Tendering (DDI) requested installations of intermediate gantry in bay ACA14 due to short circuit requirements of 50kA, and bay length of 93500mm. Due to the change in the technical requirements by SEPS technical committee and re-evaluation of the short circuit withstand capacity to 40kA, the foundations for the intermediate gantry shall be omitted. Omission of the intermediate gantry required strengthening of all steel structures remaining in the substation.

This omission allowed to improve the passage from existing cable channel by fitting the passage of the duction routes through the existing cable channel was solved by making the hole, fitting the cable route (HDPE pipes) according to SEPS internal standard IS-021 passages through the existing cable channel are designed by fitting locksmith products 6 out of 2 pieces (ROXTEC sealing modules are installed in them and designed in SO 369 Fire-stops).

Due to unexpected high level of underground water and wet basements water pumping was installed and basic concrete layer was made to improve the foundation basis.

SO 525 Cable channels

Detail design for Tendering (DDI) requested installations the cable route terminations using PVC pipes, PVC fittings. Internal standard IS-021 requires HDPE pipes, HDPE fittings and ROXTEC module cable route termination in RSN4 cable termination frame.

This request initiated following changes:

- supply and installation of RSN4 cable terminations including sealing
- earthing of RSN4 endings
- construction of foundations for RSN4 (groundworks, concrete for foundations, foundation concrete under foundations, surface treatment of foundations, expansion between foundations and shafts)

Changes of cable routes and shafts according to SEPS internal standard IS-021 requires:

- Detail design for Tendering (DDI) requested installations of the cable route transfer into the shaft by fitting a direct insertion pipeline into the shaft. SEPS internal standard IS-021 requires cable route transfer through water proof sealing.
- Change of PVC pipe type (SN4) to HDPE pipes
- change of water drainage from the shaft, originally solved by 50 mm diameter hole. IS-021 requires installation of water stop inlet.
- The change of the hatch type and addition of the earthing strip
- addition of inductive charge reducing conductors

PS07 Substation 400 kV

The upper connections of the existing V439 and V425 lines are designed for a short-circuit current of 40kA. The upper connection of the new field no. 14 was designed for a short-circuit current of 50kA in accordance with the current project for building permit and contractor selection documentation.

Local increase in the required parameters for only one bay requires a different technical solution for such a outlet bay from the existing outlet bay - thereby disrupting a certain substation uniformity.

In order to unify the short-circuit resistance requirements of the upper connection of the new field no.14 with existing upper connections in the original substation, which are designed at 40kA and in order to maintain the uniformity of the substation, it was necessary to decrease the short-circuit resistance to 40 kA and omission intermediate gantry and related insulator strings.

These reasons were considered by the SEPS technical committee. SEPS technical committee changed the requirement for short circuit withstand capacity from 50kA to 40kA.

The change of the required short-circuit current of the upper connection has an impact on the modification of the solution within PS07 – Substation 400kV and SO522 – Substation 400kV.

4. Variation description

Part enlargement SO369, SO522, SO525

Differences between DRS and DVZ are as follows:

SO 369 Fire-stops

- a) Addition of fire-stops and specification of the number and type of ROXTEC sealing modules

SO 522 Substation 400 kV

- b) Addition of water pumping from the pits
- c) Addition of excavation fencing during the implementation
- d) Addition of locksmith products 6/z - the passage of cable routes through the existing cable channel

- e) The change in number of foundations for HOK
- f) Addition of concrete for the foundations for POK and HOK

SO 525 Cable channels

- g) Conversion of cable ending to RSN4 ending - supply, assembly, surface treatment, sealing, anchoring
- h) Construction of foundations under the RSN4 ending - groundworks, concrete for foundations, concrete under foundations, surface treatment of foundations, expansion between foundations and shafts
- i) Change of hatch shaft type, addition in number of hatches (+1 pcs), earthing of hatches
- j) Pipeline routes- change in the type of pipes, fittings and their quantities used
- k) Design of the passage of pipe routes through the shaft wall by means of the sewer pipe or slips + waterproofing with a swelling strip
- l) Adding drainage outlets to cable shafts
- m) Earthing of shaft hatches and RSN4 cable outlets

PS 07 Substation 400 kV

- a) Omission of intermediate gantry and related insulator strings

5. Financial summary

Detailed budget and bill of quantity (BoQ) is attached to this document.

Part enlargement SO369, SO522, SO525

- b) Original budget DVZ – attachment no.1
- c) Budget for proposed solutions – attachment no.2
- d) Comparative Budget DRS - DVZ– attachment no.3

Part PS 07 Substation 400kV omission of intermediate gantry

- a) Original budget DVZ – attachment no.7
- b) DDI Budget and BoQ – attachment no.8
- c) Comparative Budget DRS - DVZ– attachment no.9

Financial summary for part SO enlargement SO369, SO522, SO525:

Variation order budgeted costs:	296.640,84 EUR
<u>Original budgeted BoQ from Tender:</u>	<u>-244.245,07 EUR</u>
Costs difference	52 395,77 EUR

Financial summary for part PS 07 Substation 400kV Omission of intermediate gantry:

Variation order budgeted costs:	639.645,00 EUR
<u>Original budgeted BoQ from Tender:</u>	<u>- 694.894,80 EUR</u>
Costs difference	- 55.249,80 EUR

Total costs for the Variation order no. 15: - **2 854,03 EUR**

6. Completion Date Impact

This variation does not influence overall completion date.

7. Attachments

- Attachment no.1 - Original budget DVZ
- Attachment no.2 - DDI budget and BoQ
- Attachment no.3 - Comparative Budget and BoQ DDI-TD
- Attachment no.4 - DVZ + DRS SO 522 - Substation 400 kV - Plan and section,
Archive no. KRIZ=CCA+SO522&CLH_DB02
- Attachment no.5 - DVS + DRS - SO 525 Cable channels - Plan and section, archive no.
KRIZ=CCA+SO525&CLH_DB01
- Attachment no.6 - DRS earthing of shaft hatches and cable outlets RSM4 - Planimetric drawing
ACA14, archive no. KRIZ=PS07&ELD_DB02
- Attachment no.7 - Original budget BoQ from Tender
- Attachment no.8 - DDI Budget and BoQ
- Attachment no.9 - Comparative Budget and BoQ DDI-TD
- Attachment no.10 - Planimetric drawing ACA14, archive no. 1209414/SPVZ/PS07/07
- Attachment no.11 - Planimetric drawing ACA14, archive no. KRIZ=PS07&ELD_DB01

Attachment no.1 - Original budget DVZ

Attachment no.2 - DDI budget and BoQ

Attachment no.3 - Comparative Budget and BoQ DDI-TD

Attachment no.4 - DVZ + DRS SO 522 - Substation 400 kV - Plan and section,
Archive no. KRIZ=CCA+SO522&CLH_DB02

Attachment no.5 - DVS + DRS - SO 525 Cable channels - Plan and section,
archive no. KRIZ=CCA+SO525&CLH_DB01

Attachment no.6 - DRS earthing of shaft hatches and cable outlets RSM4 -
Planimetric drawing ACA14, archive no. KRIZ=PS07&ELD_DB02

Attachment no.7 - Original budget BoQ from Tender

Attachment no.8 - DDI Budget and BoQ

Attachment no.9 - Comparative Budget and BoQ DDI-TD

Attachment no.10 - Planimetric drawing ACA14, archive no.
1209414/SPVZ/PS07/07

Attachment no.11 - Planimetric drawing ACA14, archive no.
KRIZ=PS07&ELD_DB01

Attachment no.1 - VO17
Circuit breaker construction

Attachment no.2 - VO17
Updated financial proposal for Variation Order 17

GOPA – INTEC, GmbH
Office Bratislava
SEPS, a.s.
Mlynské Nivy 59/A
824 84 Bratislava 26

Bratislava, 20.06.2019

Subject: 400kV Circuit breaker upgrade „Substation Bystričany – transformation 400/110kV “

Following your request and the assumptions of technical meeting held on 4 June 2019 at SEPS office, Bratislava, we hereby enclose the price breakdown of 400kV Circuit breaker upgrade (Alternative 3) for the project „Substation Bystričany – transformation 400/110kV “as follows:

<i>Material</i>				35 890,00 €
Insulator	pcs	3,000	6 690,000	20 070,00 €
Trigger rod	pcs	3,000	3 950,000	11 850,00 €
Assembly material	set	1,000	460,000	460,00 €
Steel support structure	pcs	3,000	1 170,000	3 510,00 €
<i>Electro-assembly</i>				0,00 €
ABB Supervision	pcs	3,000	0,000	0,00 €
Transportation	set	1,000	0,000	0,00 €
CB disassembly 3 phases	set	1,000	0,000	0,00 €
CB assembly 3 phases	set	1,000	0,000	0,00 €
<i>Design and engineering</i>				0,00 €
Design	%	5,000	0,000	0,00 €
1pc - 400kV Circuit breaker (3 phases)				35 890,00 €

Total - 4pcs of 400kV Circuit breaker	pcs	4,000	35 890,000	143 560,00 €
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Spoločnosť je zapísaná v obchodnom registri Okresného súdu Bratislava I, Oddiel Sa, Vložka číslo 5058/B

Vybavuje: Ing. Ľubomír Rubint
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Bankové spojenie:
TATRA BANKA a.s.
IBAN: SK26 1100 0000 0026 2004 0555
SWIFT: TATRSKBX



Above stated data are part of trade secret and therefore confidential. These data can be used for purpose of cost justification for 400kV Circuit breaker upgrade (Alternative 3) for the project „Substation Bystričany – transformation 400/110kV “only.

Ing. Ľubomír Rubint
projektový manažér

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www.spie.com



Súbor stavieb „Transformácia 400/110kV Bystričany“

Complex ES Bystričany – Transformation 400/110kV

Rozvodňa Bystričany - transformácia 400/110kV

Substation Bystričany - transformation 400/110kV

Zmenové konanie č. 17 – PS07 rozvodňa 400kV

Vylepšenie vypínača 400kV

Variation Order no. 17 – PS 07 Distribution 400kV

400kV circuit breaker upgrade

Vypracoval / Created by **Ing. Bálint**

Kontroloval / Checked by **Ing. Arnold**

Schválil / Approved by **Ing. Rubint**

Zákazka č. / Contract

Označenie / Document No.

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1. Identification Data

Construction:	Substation 400kV Bystričany
Site:	Electric station 220/110 kV Bystričany Region: Trenčín District: Prievidza Village: Bystričany Cadastral Area: Bystričany
Investor:	Slovenská elektrizačná prenosová sústava, a. s. Mlynské Nivy 59/A 824 84 Bratislava Slovak Republic
Future operator:	Slovenská elektrizačná prenosová sústava, a. s. Mlynské Nivy 59/A 824 84 Bratislava Slovak Republic Slovak Republic

2. Reasons for Variation

The variation deals with improvement of parameters of the substation in line with Art. 13.2 of the Contract for Works that will enhance safety of operators and efficiency of maintenance of operation of the finished construction for the investor. The improved parameters will comply with technical parameters of circuit breakers supplied within the next construction of extension of the substation by the transformation 400/110 kV.

3. Reasoning

R400 kV is almost completely constructed. In line with tender documentation, circuit breakers with surface path 25 mm/kV were proposed in detail design documentation. There is a service road of the substation situated near the circuit breaker below the tube line from the circuit breaker. The tube line is situated in the height of 7,500 mm above the road to enable safe passage of large vehicles with the maximum height of 3,500 mm. Thus, higher steel chairs were used at installation of the circuit breakers to maintain the clearance under the tube lines. If taking into account the existing design, cabinets of circuit breaker actuators are situated in the height not accessible by the personnel from the ground. The actuator cabinet is firmly connected with the circuit breaker drive through an insulation rod, and it cannot be separated. To enable operation, such design requires use of a service platform with the height of 1

m. From the safety viewpoint, such design is considered to be risky, and at adverse weather, such as snow, black ice, wind, high and low temperatures, a high probability of accident exists.

Therefore, we propose to replace the lower part of the circuit breaker (lower insulator and insulation rod of the circuit breaker) with the one longer by one meter. The replacement of these parts will increase a surface path of the circuit breaker to 31,5 mm/kV which will result in better technical parameters of the circuit breakers, and thus they will have the surface path as circuit breakers that will be delivered during next extension of the substation by transformation 400/110 kV, i.e. they will have the surface path 31 mm/kV. The cabinets of circuit breaker actuators will be accessible from the ground, and therefore a visual examination of actuator cabinets can be made without any aids needed.

Advantages of the new design (31,5mm kV) are:

- The solution does not require any additional interventions (modifications) to foundations, cable routes, terminals of cable lines, steel structures, roads, tube connection between the circuit breaker and the instrument current transformer.
- Use of the steel structure normally supplied with the circuit breaker without any enforced interventions to the structure, its anchoring etc.
- Possibility of usage of original clamps on instruments, not needed to specify and order any new clamps.
- Lowering of position of the actuator cabinets in each phase of the circuit breaker (lower edge of the cabinet will be at the height of 752 mm, upper in the height of 2,492 mm):
 - Not needed to spend any costs for handling the platform;
 - Better accessibility of the cabinet;
 - Enhancement of safety of operators who can reach the circuit breaker actuator cabinet from the ground without the necessity to use any climbing gears.
- Keeping the required height of the bus bar (7,500 mm):
 - Not needed to spend any costs for modification of existing tube bus bars;
 - Necessary to replace the road clearance for passage of vehicles with the height up to 3,500 mm that the general designer does not agree with.
- Extension of the insulator cleaning interval, and thus reduction of operating costs.

Because of operation reliability, ceramic insulators require regular cleaning and disconnection of a respective field of the substation. In the Bystričany site, this necessity is increased because of close proximity of several companies releasing chemical emissions and also dust particles to atmosphere at their operation (Nováky coal power plant, PORFIX, Fortischem that has extended its production during the construction phase). The proposed solution considers improved parameters of insulators (increase of surface path from 25 to 31,5 mm/kV, which enables to extend the insulator cleaning interval).

- “Piece for piece” exchange:
 - Simpler and faster replacement of support “I” insulators;
 - Lower risk of potential complaints in future (e.g. release of SF6 gas, increased humidity in the insulator chamber, contamination of the insulation rod etc.).

Summary of main reasons:

- Enhancement of safety of operators at operation and in-service actions at circuit breaker actuator cabinets according to STN EN 62 271-1 and STN EN 33 2000-5-53;
- Reduction of operating costs for cleaning and maintenance of circuit breaker insulators – increased surface path (from 25 to 31 mm/kV) – extension of the cleaning interval;
- Harmonisation of parameters of substation circuit breakers with parameters of the future transformer station – enhancement of operation reliability.

4. Description of Variation

The variation consists in replacement of the lower part of the circuit breaker (lower part of the insulator and insulation rod) with the insulator and rod longer by 1 m, and replacement of the steel structure below the circuit breaker with the one lower by 1 m.

- Disassembly of existing circuit breakers.
- Replacement of the short insulator 25 mm/kV with the longer one – 31 mm/kV.
- Replacement of the long support chain with the lower one.
- Reassembly of the circuit breaker.

5. Financial Summary of Variation

Detail specification of financial costs is mentioned in Attachments hereto.

- a) Original budget BoQ of Tender – Attachment No. 5.
- b) DDI budget and BoQ – Attachment No. 6.
- c) Comparative Budget and BoQ DDI-TD – Attachment No. 7.

Summary of costs for PS 07 Substation 400 kV:

Variation order budgeted costs:	2.941.569,64 EUR
<u>Original BoQ budgeted costs:</u>	<u>2.798.009,64 EUR</u>
Cost Difference:	143.560,00 EUR

6. Impact on Completion Deadline

The affected changes do not have any impact on final commissioning deadline.

7. Attachments

Attachment No. 1 – Preliminary approval by Managing Director of Division of Development and Investment, SEPS

Attachment No. 2 – Construction General designer statement

Attachment No. 3 – Circuit breaker's layout – original situation

Attachment No. 4 – Circuit breaker's layout – new situation

Attachment No. 5 – Original budget BoQ from Tender

Attachment No. 6 – DDI budget and BoQ

Attachment No. 7 – Circuit breaker cost to be paid by the Employer Breakdown

Attachment No.1

*Preliminary approval by Managing Director of Division of Development and Investment,
SEPS*

Vydanie predbežného súhlasu na vylepšenie vypínača 400kV – Rozvodňa Bystričany – transformácia 400/110kV

Na základe predloženej realizačnej dokumentácie a potrebných súhlasov a vyjadrení o jej prerokovaní vydávam v zmysle SM 09/2009 Prílohy D časť B, bod 3

predbežný súhlas

na zrealizovanie **vylepšenia vypínača 400kV – Rozvodňa Bystričany – transformácia 400/110kV s celkovým navýšením ceny stavby o 150 738,00 € bez DPH.**

Súčasne ukladám v zmysle ZoD 2016-0295-1177501, podpísanej dňa 6. február 2017, vypracovať Dodatok č 4 k tejto ZoD.

V Bratislave dňa 14.8.2019

Ing. Miroslav Stejskal
vrchný riaditeľ úseku rozvoja a investícií

Attachment No.2

Stanovisko Generálneho projektanta

Construction General designer statement.

SPIE Elektrovod, a.s.
 Ing. Tomáš Bálint
 Prievozska 4C
 824 66 Bratislava 26

VÁŠ LIST ČÍSLO / ZO DŇA	NAŠE ČÍSLO	KÓD CITLIVOSTI ¹⁾	VYBAVUJE / LINKA	DÁTUM
e-mail/9.8.2019	14139/2019	3	Ing. Dekýš/0905587318	12.8.2019

VEC

Vyjadrenie generálneho projektanta k zmenovému konaniu č.17 PS07 - rozvodňa 400kV pre stavbu „Rozvodňa Bystričany - transformácia 400/110kV“

Dňa 9.8.2019 sme obdržali Vašu žiadosť o vyjadrenie k predmetnému zmenovému konaniu. Predmetom zmenového konania je výmena spodných dielov vypínačov za účelom zníženia výšky pohonových skríň pri zachovaní prejazdového profilu popod rúrové vedenie k vypínaču. Danou zmenou dochádza k nárastu povrchovej izolačnej dráhy vypínača, ako aj k vytvoreniu lepšieho prístupu k pohonovým skriniam. Nakoľko tieto zmeny zvyšujú bezpečnosť a úžitkovú hodnotu diela, nemáme proti nim žiadne námietky a súhlasíme s ich realizáciou v zmysle popisu v predloženom zmenovom konaní.

Ing. Michal Dekýš
 Vedúci oddelenia 1240

TEL: 0905587318 / EMAIL: michal.dekys@vuje.sk
 IČO: 31450474 / DIČ: 2020392539 / IČ DPH: SK2020392539
 Zapísaná v OR OS Trnava, odd. Ss, vložka č. 164/T
 BANKOVÉ SPOJENIE: Tatra banka, a.s., č. ú. 2626004387/1100
 IBAN: SK54 1100 0000 0026 2600 4387 / BIC: TATRSKBX



Attachment No.3

Circuit breaker's layout – original situation – 25mm/KV

Attachment No.4

Circuit breaker's layout – new situation – 31,5mm/kV

Attachment No.5

Original budget BoQ from Tender

Attachment No.6

VO17 budget and BoQ

Attachment No.7

Circuit breaker cost to be paid by the Employer Breakdown



GOPA – INTEC, GmbH
Office Bratislava
SEPS, a.s.
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Design	%	5,000	0,000	0,00 €
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Total - 4pcs of 400kV Circuit breaker	pcs	4,000	35 890,000	143 560,00 €
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projektový manažér

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**Annex 4 to Amendment No. 4
Contract Price Increase Summary**

Annex 4 to Amendment No. 4

Project: Substation Bystričany - transformation 400/110 kV / Rozvodňa 400 kV Bystričany
Substation Horná Ždaňa - enlargement / Rozvodňa 400 kV H. Ždaňa - rozšírenie
Substation Križovany - enlargement / Rozvodňa 400 kV Križovany - rozšírenie

Contract Price Increase Summary

Contract Price as signed	13 900 104,56 €
Approved Variations to the Contract, series I as per Annex 2 to Amendment No. 2	390 542,57 €
The Contract Price as per Amendment No. 2	14 290 647,13 €
Rectified Values of the Approved Variations to the Contract, series I as per Annex 1 to Amendment No. 3 (increase above the determined values in Amendment No. 2)	620,84 €
Approved Variations to the Contract, series II as per Annex 3 to Amendment No. 3	695 021,82 €
The Contract Price as per Amendment No. 3	14 986 289,79 €
Approved Variations to the Contract, series III as per Annex 2 to Amendment No. 4	147 324,12 €
Amendment No. 4 total price increase	147 324,12 €
The Contract Price as per Amendment No. 4	15 133 613,91 €