

**PE “ELECTRIC POWER INDUSTRY OF SERBIA - EPS”
BRANCH “DRINSKO - LIMSKE HPPs”
HPP “BAJINA BAŠTA” - PERUĆAC**

PSPP “BAJINA BAŠTA”

**Public Procurement Procedure
No. JN VV-BB 28/2015**

**TENDER DOCUMENTS
FOR PURCHASING OF TURBINE GOVERNOR
FOR UNITS NO.1 AND NO.2 AT PSPP “BAJINA BAŠTA”**



August 2015

**TENDER DOCUMENTS
FOR PURCHASING OF TURBINE GOVERNOR
FOR UNITS NO.1 AND NO.2 AT PSPP "BAJINA BAŠTA"**

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VOLUME 0: INVITATION AND INSTRUCTIONS TO TENDERERS

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0. Invitation to Tenderers

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11000 Beograd
Branch DRINSKO - LIMSKE HPPs
Trg Dušana Jerkovića 1
31250 Bajina Bašta
Tel + 381 (0)31 863 866**

Pursuant to the Article 55, Paragraph 1, Clause 2, the Article 57 and the Article 60, Paragraph 1, Clause 1 of the Law on Public Procurements ("Official Gazette of the Republic of Serbia", No. 124/12),

Announces:

INVITATION FOR SUBMISSION OF TENDERS No. JN VV-BB 28/2015

For collection of Tenders in the open procedure for Public Procurement of goods No. JN VV-BB 28/2015 – Purchasing of the Turbine Governor for Units No.1 and No.2 at PSPP "Bajina Bašta".

Subject matter of this Public procurement is:

- Delivery of goods and
- Technical Services for Governor, AFC/JC Rehabilitation

Description of subject matter of the Public Procurement and the Employer's requirements have been defined in the Tender Documents. Tenders have to be prepared and submitted in compliance with the Tender Documents, as well as this Invitation.

NAME AND CODE TAKEN FROM THE GENERAL PROCUREMENT VOCABULARY

- Name – „**Purchasing of the Turbine Governor for Units No.1 and No.2 at PSPP "Bajina Bašta"**”
- Code – **31161000**

The criterion for the award of contract in the relevant public procurement is the most economically advantageous offer, and is based on the following elements of criterions:

| Criterion | Points |
|---------------------------------------|---------------|
| Price [K1] | 70 |
| Technical characteristics [K2] | 25 |
| Time of Delivery [K3] | 5 |

Any interested local or foreign legal entity or natural person, which/who meets the conditions specified under the Article 75 of the Law on Public Procurements (hereinafter referred to as: LPP), has the right to participate in this procedure.

Fulfilment of the conditions shall be proved by the mandatory documents, foreseen under the Article 77 of the Law on Public Procurements, as follows:

| No. | Conditions for Participation in Public Procurement Procedure | Evidence of Fulfilment of Conditions |
|-----|---|--|
| 1. | The Tenderer's registration with the competent authority i.e. entry in the relevant register | <p align="center">Excerpt from the register of the competent authority</p> <p align="center">1) Fore legal entity:</p> <p>Excerpt from the register of the Business Registers Agency</p> <p>Excerpt from the register of the competent Commercial Court (authority)</p> <p align="center">2) For natural entity:</p> <p>Excerpt from the register of the Business Registers Agency</p> <p>Excerpt from the relevant register</p> |
| 2. | The Tenderer and his legal representative must not be convicted of a criminal deed as members of a criminal organization, they must not be convicted of criminal deeds against industry, criminal deeds against environment, corruption or bribery, fraud | <p align="center">Certificate of the competent court</p> <p align="center">1) Fore legal entity:</p> <p>Excerpt from penal records:</p> <p>- Legal representative - Certificate of the competent police administration of the Ministry of Interior</p> <p>- Legal entity - Certificate of the competent court</p> <p align="center">2) For natural entity:</p> <p>Excerpt from penal records - Certificate of the competent police administration of the Ministry of Interior</p> |
| 3. | <ul style="list-style-type: none"> - A measure of prohibition of performance of activities must not be imposed on the Tenderer and valid at the time of the publishing of the Invitation to Tender, or in case of foreign tenderer: - Declaration signed by the company representative and certified by competent authority for lack of circumstances preventing the bidder from performing economic activity by any measure, | <p align="center">Certificated of the competent court or authority competent for registration of business entities</p> <p align="center">1) Fore legal entity:</p> <p>- Certificates of the Commercial and Magistrates Court or Certificate of the Business Registers Agency, or</p> <p>- Cerificates by competent authority (notary, etc) - certify that declaration is signed by authorized company representative</p> <p align="center">2) For natural entity:</p> <p>Certificate of the Magistrates Court</p> |
| 4. | The Tenderer must have due taxes, contributions and other public levies paid in accordance with the regulations of the Republic of Serbia | <p align="center">Certificates of the competent tax authority and compulsory social insurance organisation or certificates of the competent authority that the Tenderer is</p> |

| | | |
|-----------|---|---|
| | <p>or of a foreign state if his head office is located in its territory</p> | <p style="text-align: center;">undergoing privatization process</p> <p style="text-align: center;">1) Fore legal entity:</p> <p>Certificate of the Tax Administration of the Ministry of Finance and Economy (taxes and contributions)</p> <p>Certificate of the local self-government (original local public revenues)</p> <p style="text-align: center;">2) For natural entity:</p> <p>Certificate of the Tax Administration of the Ministry of Finance and Economy (taxes and contributions)</p> <p>Certificate of the local self-government (original local public revenues)</p> |
| <p>5.</p> | <p>General Experience The average annual turnover as prime contractor (defined as billing for contracts in progress or completed) for the last four (4) years in amount not less than EUR 5 million equivalent.</p> | <p>Audited balance sheets or if not required by the law of the tenderer's country – copies of financial statements with confirmation of receipt of their originals by the tenderer's tax authorities for the last four (4) years including the last reporting period of 2014 shall be submitted and must demonstrate the soundness of the tenderer's financial position, showing its long-term profitability</p> |
| <p>6.</p> | <p>Specific Experience Successful experience as a contractor in the execution of at least five (5) contracts related to rehabilitation of electrical and hydraulic equipment of turbine governors of PSPPs and HPPs within the last 3 years.</p> | <p>Reference list which Supplier certificate rehabilitation of at least five (5) turbine governors, electric (regulator) and hydraulic (actuator) part, within the last three years, counting from the date of publishing of the Invitation.</p> <p>The Reference List has to be certified and signed by the responsible person.</p> <p>The references have to be fully verifiable and the data stated about the Buyers/Employers (name, address, e-mail address, contact, number and type of the delivered units, etc.) have to be full and accurate.</p> <p>As a reference, the rehabilitation of turbine governors, electric (regulator) and hydraulic (actuator) part employed in PSPPs and HPPs shall be considered.</p> |

Required evidence must not be older than six months from the date of publishing of the Invitation.

The Tenderer has to fulfil all conditions stipulated in the above Table i.e. he shall provide all relevant evidence depending on whether the Tender is submitted by a legal or natural entity. If the

Tenderer fails to fulfil any condition from the above Table, the Tender will be evaluated as unacceptable.

The Tenderer is not obliged to provide evidence that is publicly available on the web sites of the competent authorities but in such a case he shall specify such evidence and the web sites where it is available when submitting his Tender, otherwise he shall submitted all evidence stipulated in the above Table in order for his Tender to be considered acceptable.

Evidence of fulfilment of conditions may be submitted in unverified copies and the Employer may request the Tenderer whose Tender has been evaluated as the successful Tender based on the Report of the Committee for Public Procurement to provide for insight the original or verified copy of all or particular evidence before reaching a Decision on Contract Award.

If the Tenderer does not provide for insight the original or verified copy of the requested evidence within the specified, appropriate deadline that shall not be shorter than five days, the Employer will reject his Tender as unacceptable.

The instructions to the Tenderers for preparation of the Tender were an integral part of the Tender Documents.

The Tender has to comprise all the data mentioned in the Tender Documents.

The Tender shall be prepared on the form and in accordance with the instructions comprised within the Tender Documents.

The Tenders with Variants are not allowed and any Tender of that kind shall be rejected.

The Tender has to be clear and unambiguous, typed or written in non-erasable ink and verified with the seal and the signature of the Tenderer's authorized person.

Tenders shall be submitted in sealed double envelope with mark "**JN VV-BB 28/2015 - DO NOT OPEN**".

Tenders should be submitted by courier mail or by personal hand over to Employer's address. The deadline for Tenders submission is 30 (thirty) days from the publishing date of the Invitation in the Official Gazette of the Republic of Serbia, by 12:00 h. In case that 30-eth day expires on not working day (Saturday, Sunday or Public Holiday), the first next working day to be considered as last day for Tenders submission.

Tender validity date shall be at least 90 days counting from Public opening of the Tenders date.

The Tender which will be received and verified with the receipt stamp at the Employer's clerk's office (**Branch DRINSKO - LIMSKE HPPs, Trg Dušana Jerkovića 1, 31250 Bajina Bašta**) by 12:00 hours of the deadline at the latest, regardless of the manner in which the Tenders were sent (by courier mail or handed over at the Employer's clerk's office), will be considered as submitted on time. **Dead line for Tender submission is Oktober 1st 2015.**

Incomplete Tenders and Tenders not submitted on time shall not be taken into consideration.

Public opening of the Tenders shall be performed in Employers head office (Branch DRINSKO - LIMSKE HPPs, Trg Dušana Jerkovića 1, 31250 Bajina Bašta) on the last day for Tenders submission at 12:30 h, in the presence of authorized representatives of the Tenderers.

Before beginning of public opening of the Tenders, the attending representatives of the Tenderers are obliged to hand over the written Power of Attorney for participation in the Tender opening procedure, to the Committee for Public Procurement.

The decision concerning awarding of the Contract for Public Procurement shall be made within fifteen 15 days from the Tenders opening date. In accordance with the Law on Public Procurements, the Tenderers shall be notified in written form about the decision which was made.

The criterion for evaluation of Tenders is the economically most favourable Tender.

The Tender Documents can be downloaded from the Web Portal of the Public Procurements Office of the Republic of Serbia within 15 (fifteen) days from the date of publishing of the Invitation to Tender in the Official Gazette of the Republic of Serbia.

If the documents cannot be downloaded (due to large amount of data to be downloaded, downloading problems, voluminous documents etc.), the Tender Documents can be obtained in electronic format (CD or DVD). The Tenderer shall submit a written request for the supply of the Tender Documents to the contact persons listed below. Such a written request shall contain the following: Subject - Request for Supply of Tender Documents for PP (insert the name of the Public Procurement) in an open procedure per Part, full name, address and head office of the Tenderer. The contact persons shall forward the Tender Documents to the Tenderer's address within 24 hours from the receipt of the Request. The Tender Documents will be sent by mail or courier (DHL, Post Express etc.) as a whole.

All additional information can be obtained from following persons:

Mr. Dušan Trišić, M.Sc.E.E.
Tel: +381 31 590 957
E-mail: dusan.trisic@dlhe.rs

Mr. Dušan Živković, M.Sc.E.E.
Tel: +381 11 395 23 77
E-mail: dusan.zivkovic@eps.rs

Ms. Nataša Popović, dipl.lawyer
Tel: +381 31 590 900
E-mail: natasa.popovic@dlhe.rs

1. TENDER DOCUMENTS

- 1.1 For this Public Procurement, i.e. submission of Tenders, the Tender Documents are comprised in the Volumes 0, 1, 2, 3, 4, 5, 6, 7 and 8.
- 1.2 The Tenderer is expected to study completely the Tender Documents, because all risks for omissions in the Public Procurement procedure, including the risk of Tender rejection due to untidiness or non-compliance with the Tender Documents, shall be borne by the Tenderer.

2. Deadline for submission of the Tender

Stated in the Invitation to Tenderers.

3. Clarification of Tender Documents

Tender Documents have been prepared in such a manner to maximally avoid the possibility of subsequent clarifications.

However, if the prospective Tenderer seeks for any clarification of Tender Documents, he shall notify the Employer accordingly in written form and within 5 (five) days prior to expiration of the deadline for submission of the Tenders. Within 2 (two) days from the date of receipt of such request, the Employer shall send the written reply to the Tenderer and at the same time the Employer shall send such information to the other Tenderers which have obtained the Tender Documents.

4. Modifications and Supplements to Tender Documents

- 4.1 If within the time limit envisaged for submission of the Tenders, the Employer modifies or supplements the Tender Documents, he is obliged to submit such modifications or additions, without any delay and without any compensation, to the Tenderers which already have purchased the Tender Documents.
- 4.2 In order to enable the prospective Tenderer, during preparation of his Tender, to have sufficient time to take into consideration the modifications and additions to the Tender Documents, 6 (six) or less days prior to expiration of the deadline for submission of the Tenders, the Employer shall extend the deadline for submission of the Tenders for the period of time he considers to be necessary to take into consideration such modifications and additions and he shall inform accordingly in writing all the Tenderers to which the Tender Documents were delivered.

5. Language of Tender

The Tender prepared by the Tenderer and all the correspondence and documents concerning the Tender to be exchanged between the Tenderer and Employer, shall be in Serbian or in English language.

6. Legal Regulations

Preparation of Tenders and work related to documents which are the subject of Invitation, shall be performed in accordance with legal regulations and planning documents of the Republic of Serbia, the documents that are made available, Standards (local and foreign) and profession rules which guarantee a high quality of executed works.

The basic legal regulations that govern the subject domain are:

- Law on Public Procurements

- Enacted by-laws based on the Law on Public Procurements

By submitting their Tenders, the Tenderers confirm that they are completely informed about the current laws, by-laws, regulations, decrees and rules which, in any way, can influence or can be applied to the Public Procurement procedure and contracting.

7. PREPARATION OF TENDER AND PERTAINING DOCUMENTS

- 7.1 The Tenderer can submit only one Tender for Delivery.
- 7.2 The Tenderer is obliged to fill-in all blank spaces in the Tender Documents that are to be filled-in.

Filling-in shall be done by clearly written numbers and block letters. Correction of errors already made, Tenderer will execute by crossing out the written incorrect text, which still should be clearly readable, and writing of the correct text above it, certified by initials of the person who has signed the Tender. If the Tenderer writes-in unclear text or numbers, or does not act neatly and conscientiously in all details as indicated, the Employer can reject such Tender.

- 7.3 The Tender shall contain:
 - a) Filled-in Form of Tender with visible offered price, deadline for Delivery, amount of advance payment etc. in it, according to form in Tender Documents
 - b) Schedules of Prices
 - c) Filled-in Contract Model, with all pages initialed, confirmed with seal and signature, which confirms that Tenderer accepts the Contract Model
 - d) Tender Security
 - e) Schedules of Technical Data filled-in in compliance with General Technical Specifications and Detailed Technical Specifications
 - f) Testing Schedule, prepared in compliance with Detailed Technical Specifications
 - g) Other documentations required by the General Technical Specifications and Detailed Technical Specifications, to be submitted with the Tender

If the Tenderer wishes to add something to his Tender, he can do it on his company's letterhead.

- 7.4 As an integral part of the Tender, the Tenderer shall submit the documents determining compliance of Tender for the Delivery with the Tender Documents. These documents can be submitted in a form of text, draft and data and they should include:
 - a) A detailed Technical Description of important technical and functional characteristics for the equipment. The Technical Description should be clear, concise, along with figures, charts, characteristics, parameters and method of operation. The Technical Description shall refer solely to the equipment comprised with the Tender.
 - b) Statement that the Tender for Delivery is in compliance with the Tender Documents, i.e. for the Delivery which is not in conformity with the Tender Documents, the Schedule of Deviations for deviations and exceptions from the Tender Documents shall be filled-in (according to the form and provisions from the Contract Conditions and Forms and Technical Specifications).

The Tenderer is obliged to state in the Schedule of Deviations all the data and conditions for the Delivery he offers, which deviate from the data and the conditions as requested under these Contract Conditions and General and Detailed Technical Specifications.

It shall be considered that the Tenderer agrees with all the remaining data and conditions for the Delivery pursuant to the Contract Conditions and General and Detailed Technical Specifications that he did not state in the Schedule of Deviations.

7.5 When preparing the Tender, the Tenderer should bear in mind the fact that Standards for manufacture, materials and equipment, as well as certain types and catalogue numbers indicated in the General Technical Specifications and Detailed Technical Specifications are given for guidance only. The Tenderer can offer alternatives instead of mentioned Standards, indicated types and/or catalogue numbers, proving that they are essentially the same or better in relation to those required by the General Technical Specifications and Detailed Technical Specifications and if they are acceptable to the Employer.

7.6 As an appendix to the Tender, the Tenderer is obliged to submit documents proving that the Tenderer is eligible to participate in the Public Procurement Procedure, i.e. that he is capable of performing the complete Delivery envisaged by the Tender Documents, as stated in the Invitation.

If the Tenderer is not the manufacturer of the equipment he offers, then the Tenderer is obliged to submit the manufacturer's authorization that he can offer the equipment the manufacturer has produced according to this Public Procurement.

7.7 Within the Tender, the Tenderer is obliged to submit the reference list, by which the Tenderer confirms at least five (5) contracts related to rehabilitation of electrical and hydraulic equipment of turbine governors of PSPPs and HPPs within the last 3 years. The Tender that does not fulfil the above request in terms of technical characteristics and minimum number of references will be rejected.

The Reference List has to be certified and signed by the responsible person.

The references have to be fully verifiable and the data stated about the Buyers/Employers (name, address, e-mail address, contact, number and type of the delivered units, etc.) have to be full and accurate.

7.8 The Tenderer is obliged to submit with his Tender the informative list of special tools (if needed) which he intends to deliver to the Site and the planned dates of delivery of these tools to the Site.

7.10 It is necessary to provide with the Tender the planned number of personnel, engineers, technicians, etc.

7.11 The Tenderer is due to submit with his Tender, complete set of Tender Documents taken from Employer, with all pages signed by authorised person of Tenderer.

8. TENDER FORM

The Tenderer shall fill-in the Tender Form with short description of Delivery. The Tender Form is given in the Volume 1, Part III: Forms.

9. TENDER PRICES AND MODALITY OF PAYMENT

9.1 The Tenderer shall state the unit prices and the total offered price in the Schedule of Prices.

- 9.2 The total price shall be given without the taxes. Value added tax (VAT) shall be borne by the Employer.
- 9.3 Advance payment, required by Tenderer to be in percentages, must not be more than 20% of the total offered price for equipment.
- 9.4 The currency of payment shall be Serbian Dinar, i.e. Euro or other convertible currency (when the selected Tenderer is from abroad). The Serbian Dinar-Euro or other convertible currency exchange rate shall be the average exchange rate of the National Bank of Serbia, valid on the day of opening of the Tenders.
- 9.5 All payments shall be performed according to Contract.
- 9.6 All correspondence related to payment must be in Serbian or English language.

10. TENDER CURRENCY AND CONVERSION TO UNIFORM CURRENCY

- 10.1 The prices in Tender shall be stated in Serbian Dinars (RSD) or in the foreign currency.
- 10.2 The Tenderer should declare in which currency he wishes to be paid.
- 10.3 For the purpose of comparing the Tenders, the Employer shall make conversion of all offered prices (expressed in different currencies) in Euro, as per "International Monetary Fund" exchange rate, established on the base date.

The base date is the date of opening of the Tenders.

11. SECURITIES

Tenderer, i.e. Supplier is obliged to submit the following Securities:

1. Tender Security
2. Performance Security
3. Advance Payment Security

which are to be in compliance with Volume 1, Contract Conditions and Forms, Part I: General Conditions of Contract.

12. TENDER VALIDITY PERIOD

- 12.1 Tender validity period is at least 90 days from the Tender opening date. The Employer shall reject the Tenders with shorter validity period.
- 12.2 Exceptionally, the Employer can ask the Tenderer in writing to extend the Tender validity period. The Tenderer who accepts this requirement shall not be requested and shall not be allowed to modify the Tender and the validity of the Tender Security shall be adequately extended.

The Tender Security shall be returned to the Tenderer who does not accept the request for extension of Tender validity period and his Tender will be rejected.

13. FORM AND SIGNING OF TENDER

- 13.1 The Tenderer shall prepare the Tender in 2 (two) copies, clearly marking the original and the copy. In case of any discrepancy, the original shall prevail.

- 13.2 The original and the copy of the Tender must be typed or written in non-erasable ink, signed by the Tenderer or by the authorized persons. The Power of Attorney must be attached to the Tender. All pages of the Tender, except unmodified printed material (catalogues, brochures and similar), shall be initialled by the signatory of the Tender.

14. SUBMISSION OF TENDER

- 14.1 The Tenderer shall put original and copy of the Tender to the sealed inner envelope with clearly marking which document is the original and which one is the copy. The inner envelope (with its contents) shall be placed into the sealed outer envelope.

- 14.2 The outer and the inner envelopes shall be:

- a) Sent by registered or courier mail to the Employer's address:

PE Electric Power Industry of Serbia - EPS
Carice Milice 2,
11000 Beograd
Branch DRINSKO - LIMSKE HPPs
Trg Dušana Jerkovića 1
31250 Bajina Bašta
Tel + 381 (0)31 863 866

- b) Bear the following mark: Tender for Public Procurement „**JN VV-BB 28/2015**” – “DO NOT OPEN BEFORE (the date of Tender opening stated in the Invitation to Tenderers)”.

The inner envelope shall bear the Tenderer's name and address and it shall be certified by the Tender's seal, to be returned unopened if it is not submitted on time.

- 14.3 If the outer envelope is not filled-in and marked pursuant to the previous Clause, the Employer shall not be responsible for possible miss-sending or premature opening of the Tender. Such Tender shall not be taken into consideration and shall be returned to the Tenderer.

15. JOINT TENDER

Tender can be mutually submitted from group of Tenderers. In this case the Tenderers which have submitted a joint Tender, beside the other documents, are obliged to submit their Joint Venture model of Contract, in which they take responsibility for joint execution of Delivery and regulate its responsibilities. Joint Venture model of Contract have to be signed by authorised representatives of all participants of JV which are listed in Tender.

Successful Tenderer is obliged to submit to Employer, not later than to date of signing of Contract, officially certified Joint Venture Contract which is the same as JV model of Contract submitted with the Tender.

All participants in Joint Tender are responsible to the Employer for execution of Contract.

In case that the group of Tenderers submit the joint Tender, each member of consortium has to fulfil autonomously the General conditions pursuant to Article 75, Paragraph 1, Clauses 1 to 4, while in sense of fulfilment of conditions stated in Clause 5 and Article 76 of the Law on Public Procurements, the complete consortium has to fulfil and all additional qualification demands requested by Employer.

The Tenderer who has submitted his Tender independently, cannot at the same time participate in the Joint Tender or as the Sub-Supplier.

16. ENGAGEMENT OF SUB-SUPPLIERS

The Tenderers are obliged to specify within Tender whether during execution of works this works will be executed autonomously or execution of some portion of works will be handed over to Sub-Suppliers. In case of engagement of Sub-Suppliers, the Tenderers are obliged to submit proofs of fulfilment of General conditions pursuant to Article 75, Paragraph 1, Clauses 1 to 4 of the Law on Public Procurements, for each Sub-Suppliers, while in sense of fulfilment of conditions stated in the same paragraph, Clause 5 of the Law on Public Procurements, the Tenderer and Sub-Supplier has to fulfil conditions together.

The Tenderer is responsible to the Employer for execution of the Contract, regardless of the number of Sub-Suppliers.

Any further subcontracting procedure is not allowed to the Sub-Suppliers.

17. DEADLINE FOR TENDER SUBMISSION

- 17.1 The deadline for Tender submission is stated in the Invitation to Tenderers.
- 17.2 Public opening of the Tenders shall be performed as stated in the Invitation to Tenderers.
- 17.3 The Employer can, at his own discretion, or upon the request of one or more Tenderers, extend the deadline for submission of Tenders pursuant to the Clause 4.2, in which case all the rights and obligations of the Employer and the Tenderer remain valid until the extended period, i.e. until new deadline.

18. MODIFICATION AND WITHDRAWAL OF TENDER

- 18.1 The Tenderer can modify or withdraw the Tender after its submission, if written notice on modification or withdrawal is submitted to the Employer before the deadline for submission of Tenders.
- 18.2 The Tenderer's notice on modification or withdrawal of the Tender shall be prepared, sealed, marked and sent in same manner as Tender submission.
- 18.3 Tenders can not be modified after expiration of the deadline for Tenders submission.
- 18.4 The Tenders cannot be withdrawn in the interval between the deadline for submission of Tenders and the expiration of the Tender validity period as stated in the Tender Form. Withdrawal of the Tender within this interval shall result in collecting of the Tender Security.

19. OPENING OF TENDERS

- 19.1 During Tenders opening, the Committee for Public Procurement shall announce the Tenderers' names, the offered prices and Delivery dates, attached Tender Securities, advance payment amounts and similar, without verification of the Tenders at that moment.
- 19.2 Authorised representatives of he Tenderers have the right to give objections to the Tender opening procedure itself.
- 19.3 The Protocol of Tenders opening procedure shall be made and signed by all members of the Committee for Public Procurements and the attending representatives of the Tenderers. The Protocol shall be submitted to all the Tenderers, within three (3) days from the date of opening of the Tenders.

20. CLARIFICATION OF TENDERS

To facilitate verification, comparison and evaluation of the Tenders, the Employer may request from the Tenderers the clarification of their Tenders, including a breakdown of prices. The request for clarification and response from the Tenderer must be in writing and it shall be an integral part of the Tender.

No modifications of the prices or the essence of the Tender shall be requested or accepted. Such a request of the Tenderer can result in rejection of his Tender.

21. CONFIDENTIALITY OF TENDER EVALUATION PROCEDURE

- 21.1 All the documents from the Tender Documents are business secret of the Employer. Therefore, it is not allowed to transmit the information or disclose the data from the Tender Documents to the other persons.
- 21.2 From the moment of opening of the Tenders until reaching of the decision on contract award, the Tenderers shall not contact the Employer without his written invitation, regarding any matter related to their Tender.
- 21.3 After opening of the Tenders, information related to clarifications, verifications, comparisons and evaluations of the Tenders or recommendations concerning Contract signing shall not be available to the Tenderers or to any other person who is not officially authorized by the Employer, until signing of the Contract.
- 21.4 Any attempt of a Tenderer that can influence the Employer's decision during clarification, verification, comparison and evaluation of the Tenders, as well as the decision on Contract signing, can result in rejection of his Tender.

22. EVALUATION OF ELIGIBILITY OF TENDERERS AND VERIFICATION OF TENDERS

- 22.1 Before verification of Tenders, the Committee for Public Procurements shall evaluate eligibility of the Tenderers.

To that effect and based on data from the documentation accompanying Tender, the Committee for Public Procurements shall evaluate eligibility of the Tenderer.

A Tenderer shall be considered eligible if his experience, financial stability and other elements provide, according to the evaluation of the Committee for Public Procurements, a reasonable guarantee that the Tenderer can perform the Delivery in a high-quality manner, within the offered time limit and that he can fulfil his contractual obligations.

If the Committee evaluates some Tenderer as non-eligible, his Tender shall be rejected.

- 22.2 Before detailed examination and comparison of Tenders of eligible Tenderers, the Committee shall verify the conformity of each Tender for Delivery with the Tender Documents.

The Tender in which the Tenderer has filled in the Schedule of Deviations can be declared by the Committee as conformed with the Tender Documents, if the Committee establishes that technical characteristics and quality of the equipment stated in the Schedule of Deviations are the same or better than those required by the Tender Documents.

The Tender which the Committee, on the basis of the above mentioned, declares as non-conformed with the Tender Documents shall be rejected. The Tenderer has no right to modify such Tender or to withdraw it.

- 22.3 The Tenders of eligible Tenderers for which the Committee establishes to be in conformity with the Tender Documents shall be then verified by calculation.

The discovered calculation errors shall be corrected in the following manner:

- a) If there is a discrepancy between the amount expressed in figures and in words, the amount expressed in words shall be considered correct
- b) If discrepancy is discovered between the unit price and the total price calculated by multiplying the unit price by the quantity, the unit price shall be adopted and the total price shall be corrected
- c) If there is a discrepancy between the total price and the sum of the unit prices, the sum of unit prices shall be considered correct and taken to form the new total price
- d) If there is an obvious error in the position of the point or comma in the unit prices, the total amount of the price shall be deemed accurate and if there is an obvious error in the position of the point or comma in the total amount, the sum of the unit prices shall be deemed accurate

The offered price as stated in the Tender Form shall be corrected by the Committee, in conformity with the procedure described above. This amount shall be considered the offered amount and it shall represent the offered value for the Delivery. If the Tenderer does not accept the amount of the Tender corrected in such a manner, his Tender shall be rejected.

- 22.4 If, after detailed examination, the Committee has noted certain incorrectness, imprecision or omission in the Tender, additional clarification shall be requested from the Tenderer. In that case, the Tenderer is obliged to submit the requested written clarification to the Employer within 7 (seven) days.

The Employer can accept completely the Tenderer's explanation, which shall have no influence on the price and the deadline of Delivery as given in the Tender.

23. COMPARISON AND EVALUATION OF TENDERS

The Committee for Public Procurements shall compare, evaluate and rank the Tenders of eligible and qualified Tenderers, which are conformed to the Tender Documents and which have been verified by calculation and controlled in details, in accordance with the following:

- 23.1 When forming proposal for the selection of the Tenderer to be awarded the Contract, it shall be acted in accordance with the criteria for selection of the economically most favourable Tender, with the following maximum possible number of points per criterion:

| Criterion | Points |
|--------------------------------|--------|
| Price [K1] | 70 |
| Technical characteristics [K2] | 25 |
| Time of Delivery [K3] | 5 |

- 23.2 If after applying the criteria for selection of the economically most favourable Tender several Tenderers have equal scores, the Tenderer whose Tender was given higher number of points under Price criterion shall be selected as the successful Tender.

Coefficient K_i , $i=1, \dots, 3$ refers to the maximum number of points under criterion.

If even in such a case Tenderers have equal scores, the criteria shall be applied in the following sequence:

Technical characteristics and Time of Delivery.

23.3 Modality of evaluation of Tenders:

a) Evaluation by the criterion of Price

The price stated in the Tender Form shall be evaluated by applying this criterion.

The Tender with the lowest price shall be awarded $N_{C_{min}} = K1$ points. The number of points to be awarded to the rest of the Tenders shall be calculated according to the following formula:

$$N_c = K1 \times C_{min} / C$$

in which C_{min} is the amount of the lowest offered price, whereas C is the amount of price from the Tender which is evaluated by this criterion.

b) Evaluation by the criterion of Technical Characteristics

The maximum number of points ($N_{t_{max}} = K2$) shall be awarded by this criterion to the Tenderer that offers the best technical characteristics.

The rest of the Tenderers shall be awarded the number of points calculated by the following formula:

$$N_t = K2 \times T / T_{max}$$

where $T / T_{max} < 1$ is the estimate of technical characteristics fulfilment in relation to Tenderer with the best offered technical characteristics.

Tenderer which offers the best technical characteristics will be determined taking into consideration the following:

- Volume 4. Schedule of Technical data – completeness of the list and technical data of the equipment ,
- Volume 3. Detailed Technical Specifications – fulfilment of the Tender requests, quality and technical level of proposed solutions,

c) Evaluation by the criterion of the Time of Delivery

The maximum number of points ($N_{i_{max}} = K5$) by this criterion shall be given to the Tenderer that offers the shortest time of Delivery.

The rest of the Tenderers shall be given the number of points calculated by applying the following formula:

$$N_i = K5 \times I_{min} / I$$

Where: I - is offered time of Delivery (in days) and I_{min} - is the shortest offered time of Delivery (in days).

24. SELECTION OF THE SUCCESSFUL TENDERER

- 24.1 After ranking of Tenders by the Committee for Public Procurement, in accordance with the criteria from Clause 23, the Employer will reach a decision on the Tenderer with whom he shall start the contracting procedure.
- 24.2 Pursuant to the Article 113 of the Law on Public Procurements, the Employer reserves the right, if the selected Tenderer does not sign the Contract within 8 days from the date of creation of conditions for concluding the Contract (expiration of the time limit for objections - complaints), to conclude the Contract with the second ranked Tenderer.

25. REASONS FOR REJECTION OF TENDER

Tender shall be rejected if:

- a) It is not submitted in accordance with Clause 14 of this Volume of the Tender Documents
- b) All the attachments, forms and documents as requested by the Tender Documents are not enclosed
- c) The offered date of Delivery is not within the planned time limit, as well as in other cases defined in this Tender Documents

26. EMPLOYER'S RIGHT TO DESIST FROM PUBLIC PROCUREMENT

The Employer reserves the right to desist from the Public Procurement before expiration of the deadline for submission of Tenders. The Employer also reserves the right to repeat the Public Procurement procedure acc. to law.

In case of desisting from the Public Procurement, the Employer shall officially inform the Tenderers accordingly. If the Tender procedure is cancelled before opening of the Tenders, sealed and unopened envelopes with Tenders shall be returned to the Tenderers.

27. REJECTION OF ALL TENDERS

During the procedure of awarding the Contract for Public Procurement, the Employer is obliged to reject all incorrect Tenders after he examines and evaluates the Tenders, but he can also reject inadequate and unacceptable Tenders.

The Employer is obliged to give a written explanation of his decision to reject all Tenders, especially stating the reasons for rejections and he is obliged to publish it in the "Official Gazette of the Republic of Serbia".

28. NOTIFICATION OF TENDER ACCEPTANCE

After reaching decision regarding the successful Tenderer, the Employer shall send written notification to all Tenderers concerning award of the Contract.

29. SIGNING OF CONTRACT

- 29.1 The Contract between the Employer and the successful Tenderer shall be signed in compliance with the provisions given in Volume 1: Contract Conditions and Forms, Part II: Contract Model.
- 29.2 After signing of the Contract with the successful Tenderer, the Employer shall publish notice of the contract award in the "Official Gazette of the Republic of Serbia".

30. CONFLICT OF INTERESTS, ANTI-CORRUPTION AND RELATED PROVISIONS

- 30.1 The entities that prepared the Tender Documents or some of parts of the Tender Documents may not appear as the Tenderers and may not cooperate with the Tenderers during preparation of the Tenders.
- 30.2 Any attempt of any Tenderer to obtain confidential information, to enter into illegal arrangements with the competitors or to influence the Committee or the Employer shall be sanctioned by disqualification of that Tenderer.
- 30.3 The Design Engineer who has participated in Tender documents preparation may not participate directly or indirectly in the Tenderer's activities that have influence on this Public Procurement without previous written consent of the Employer.
- 30.4 During Tender submission, each Tenderer shall state that there is no potential conflict of interests and that he is not in contact with other Tenderers. If a conflict of interests arises during execution of the Contract, the Supplier shall immediately inform the Employer thereof.
- 30.5. The Tenderer is obliged to keep business secrets and to keep confidentiality of the documents he received or signed during the period of Contract validity and after its finalization and he may not give the public statements about the work he is performing under this Contract without previous consent of the Employer.

31. CONTRACTING OF ADDITIONAL DELIVERIES

If necessity for contracting of additional deliveries arises, the Employer shall, pursuant to Article 36 of the Law on Public Procurements, contract such additional deliveries with the initially selected Tenderer.

32. REQUEST FOR PROTECTION OF RIGHTS

A request for protection of rights is submitted to the Republic Committee and it is delivered to the Employer (Article 149 of the Law on Public Procurements of the Republic of Serbia).

A request for protection of rights may be submitted during the entire procedure against any action of the Employer, unless otherwise stipulated in the law on Public Procurements.

A request for protection of rights that contests the type of procedure, content of invitation to Tender or Tender documents shall be deemed timely if it is received by the Employer seven days before expiry of the deadline for submission of Tenders at the latest.

After reaching decision on the Contract award, the deadline for submission of a request for protection of rights is ten days after the date of the receipt of such a decision.

Provisions governing the manner of decision Delivery from Article 108, Paragraphs 6 to 9, of the Law on Public Procurements of the Republic of Serbia shall apply to the submission of requests for protection of rights.

The Tenderer submitting the request for protection of rights shall at the same time submit a copy of the request to the Republic Committee.

The Employer shall notify all participants in the public procurement procedure about the submitted request for protection of rights i.e. he shall publish a notification of the

submitted request at the Public Procurements Portal within two days from the date of receipt of the request for protection of rights at the latest.

The Tenderer submitting the request for protection of rights is obliged to pay fee to the current account of Budget of the Republic of Serbia, pursuant to Article 156 of the Law on Public Procurements of the Republic of Serbia.

VOLUME 1: CONTRACT CONDITIONS AND FORMS

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PART I: GENERAL CONDITIONS OF CONTRACT

1. APPLICATION

These General Conditions of Contract shall be applied to all Contracts the Employer concludes for Delivery and as a whole they are valid as the part of the Contract Conditions.

2. DEFINITIONS

Some words and terms, used in this Tender Documents shall be interpreted as follows:

- 2.1 The **Employer** is PE Electric Power Industry of Serbia, Carice Milice 2, 1000 Beograd, Branch DRINSKO - LIMSKE HPPs, Trg Dušana Jerkovića 1, 31250 Bajina Bašta, i.e. the legal entity indicated as such in the Contract.
- 2.2 The **Supplier** is the company which accepted the obligation to perform the Delivery, as well as the other obligations according to the Contract. The Suppliers obligation, which is the subject of Public Procurement, is specified in the General Technical Specifications and Detailed Technical Specifications.
- 2.3 The **Delivery** means all obligations to be performed by the Supplier, the scope and distribution of which have been determined in details by the General and Detailed Technical Specifications and Contract Conditions and which is indicated in the Contract as the subject of the Contract.
- 2.4 The **Sub-Supplier** is the company with which a part of Delivery is Sub-contracted.
- 2.5 The **Engineer** is the person or the persons occasionally authorized in writing by the Employer to perform supervision, designing, testing, etc. for the Delivery, during implementation of the Contract or, if the Engineer fails to perform these obligations, the Engineer's obligations shall be undertaken by the Employer.
- 2.6 The **Tender** means formal (written) offer made by the potential Supplier to the Employer, with the prices for the Delivery as per the Schedules of Prices, and with all the other documents to be submitted with the Tender.
- 2.7 The **Tenderer** is the company which, on the basis of the Tender Documents, has prepared and submitted the Tender for the Delivery to the Employer.
- 2.8 The **Contract** means written agreement concluded between the Employer and the Supplier, as written in the document signed by the Contracting parties, including all Annexes and Appendices and all the documents to which the reference is made.
- 2.9 The **Contracting parties** are the Employer on one side and the Supplier on the other side, who mutually conclude the Contract for the Delivery.
- 2.10 The **Contract price** is the amount stated in the Contract and it shall be paid to the Supplier for his complete and correct execution of the contractual obligations.
- 2.11 The **Contract Conditions** means General Conditions of Contract and the Contract.
- 2.12 The **Technical Specifications** means General Technical Specifications and Detailed Technical Specifications.

- 2.13 The **Site** is the HPP “Bajina Bašta”, i.e. the location (the warehouse, the facility, etc.) where the works shall be executed, with necessary surrounding area, to be provided by Employer.

The terms mentioned in the Clause 2 shall be written in capital letters in the Tender Documents. If written in small letters they do not refer to the above mentioned terms.

3. OFFICIAL LANGUAGE

The Contract shall be concluded in the language of the Tender, as envisaged in the Instructions to the Tenderers. All literature, correspondence and the other documents related to the Contract, to be exchanged by the Contracting parties, shall be in that language.

4. NOTIFICATIONS

- 4.1 All notifications of one party to the other, related to the Contract, shall be submitted in writing, i.e. by fax, to be confirmed by the letter.
- 4.2 The notification comes into force on the date of delivering to the archive department of the Contracting party.

5. SCOPE AND QUALITY OF DELIVERY

- 5.1 The scope of works should comprise:
1. Preparation of documents for Delivery
 2. Manufacturing and testing of the new equipment in the workshop
 3. Packing of the equipment
 4. Transport and insurance of the equipment up to the place of unloading for the local Supplier, whereas for the foreign Supplier, the price basis shall be DAP HPP Bajina Basta, Perućac (INCOTERMS 2010), the place of unloading Bajina Bašta - warehouse of PSP “Bajina Bašta”.
 5. Supervision over installation, machining of the some parts, testing and putting into operation
 6. Guarantee for the Delivery until Final Taking-over
 7. Training of the Employer’s personnel
- 5.2 The Supplier guarantees that the equipment he delivered by the Contract is new, unused, has the contemporary structure and that it contains all the improvements as indicated in the technical solution and in the materials. The Supplier further guarantees that the Delivery under the Contract shall have no errors deriving from the technical solution, materials and workmanship or due to any other action or omission of the Supplier which might appear under normal operating conditions.

6. CONTRACT DOCUMENTS AND THEIR UTILIZATION

- 6.1 All Contract documents, which in compliance with the Contract make the integral part of the Contract, shall be mutually supplementary and mutually explanatory.

In case of ambiguity or difference in contents of the provisions of certain Contract Documents, the priority is defined in following order:

1. Contract with all Annexes and Appendices
 2. General Conditions of Contract
 3. Detailed Technical Specifications
 4. General Technical Specifications
 5. Filled-in Schedules of Technical Data, approved by Employer
- 6.2 When, even after establishing their meaning in the document having priority as per Clause 6.1, certain provisions of the Contract, in the opinion of the Supplier or the Employer, are still ambiguous or insufficiently clear, they have to be interpreted in compliance with the common resolution of the Contracting parties, as well in accordance with the Contract target.
- 6.3 Without previous written consent of the Employer, the Supplier shall not disclose the data related to the Contract or to its provisions, or the data concerning the Technical Specifications, plans, drawings or the samples obtained from or on behalf of the Employer in this respect. The exception are the persons employed with the Supplier who are engaged in execution of the Contract and the information made available to these persons shall be considered as confidential and shall be provided only to the extent necessary for execution of the Contract.
- 6.4 Without previous written consent of the Employer, the Supplier shall not use any document or information from the Clause 6.1, except for execution of the Contract.
- 6.5 All documents enumerated in the Clause 6.1, except the Contract, shall remain the property of the Employer and after execution of the Contract, if requested (all the copies), shall be returned to the Employer.

7. STANDARDS AND PATENT RIGHTS

- 7.1 The Delivery under the Contract shall be in compliance with Standards indicated in the Technical Specifications, and if not mentioned, the appropriate latest Standards shall be relevant, as well as Standards from the Supplier's country, i.e. from the country of the manufacturer of the equipment, as prescribed by the competent institution of that country.
- Specific Standards for manufacture, materials and equipment are indicated as the basic standards in the Technical Specifications. However, the other suitable Standards shall be accepted, as well as recommendations of the International Standard institutions. The condition is that essentially they shall be equivalent to the indicated Standards and that the Supplier submits for approval the detailed technical descriptions for the Standards he proposes to use and that the Employer accepts them.
- 7.2 Trade marks or catalogue numbers, i.e. reference to trade marks or catalogue numbers, if mentioned in the Technical Specifications, relate only to the Delivery for which it has been decided that the standard level is necessary to maintain certain important characteristics.
- 7.3 According to the provisions of Clause 7, the Delivery or the part of Delivery of similar characteristics shall be accepted, provided that the quality is equal or higher than the quality prescribed in the Technical Specifications and if accepted by the Employer.

7.4 The Supplier shall guarantee that execution of the contractual obligations shall not infringe anybody's patent rights or other copyrights, including trade marks, industrial design and similar.

8. TENDER SECURITY

8.1 As an integral part of the Tender, the Tenderer shall submit Tender security amounting to 200.000EUR

8.2 Tender Security shall be stated in Tender currency or in the other convertible currency.

8.3 Tender Security shall be made according to form given in Tender documents and shall be valid until expiration of Tender validity date.

8.4 If the Tenderer submits Tender security issued by foreign bank, that bank shall have at least IBCA rating AA and Employer is obliged to check financial reliability of that bank with National Bank of Serbia.

8.5 The Tender without Tender Security shall be rejected.

8.6 The Tender Security shall be returned to Tenderer as soon as possible, but not before 3 (three) days, from the day signing of Contract Agreement with successful Tenderer.

8.7 The Tender Security shall be charged:

- a) If the Tenderer withdraw his Tender during Tender validity period stated in Tender form, or
- b) If the Tenderer whose Tender is successful:
 - Does not sign the Contract
 - Does not provide Performance Security

9. PERFORMANCE SECURITY

9.1 The Supplier is obliged to submit to the Employer the Performance Security amounting to 5% of the Contract price within ten (10) days from the date of mutual signing of the Contract (Letter of Intent), in compliance with the form given within the Tender Documents.

9.2 The Employer shall collect the amount of the Performance Security in the event of any damage which occurs due to the Supplier's non-fulfilment of the contractual obligations.

9.3 If the Supplier submits the Security issued by the foreign bank, that bank must have at least AA IBCA rating and the Employer is obliged to check the financial reliability of that bank with the National Bank of Serbia.

9.4 The Performance Security shall be issued in the Contract currency, in compliance with the form given within the Tender Documentation.

9.5 The Employer shall return the Performance Security after expiration of the Warranty Period.

- 9.6 Non fulfilment of requests stated in Volume 0, Clause 29.1 and Clause 9.1 of this Volume by successful Tenderer shall be considered as sufficient basis for cancellation of successful Tender and collecting of Tender Security. In that case Employer can accept signing of Contract agreement with the next successful Tenderer or began with complete new Tender procedure.

10. ADVANCE PAYMENT GUARANTEE

- 10.1 The Supplier shall submit to the Employer the Advance Payment Guarantee within ten days after mutual signing of the Contract (Letter of Intent), shall be issued by selected Tenderer, in compliance with the form given within the Tender Documents.
- 10.2 By the Advance Payment Guarantee, the Guarantor is obligated to pay to Employer, promptly after receiving of written request, any amount up to total amount indicated in Advance Payment Guarantee, for received advance payment.

11. RESPONSIBILITY FOR DAMAGES AND ACCIDENTS

- 11.1 The Supplier must take every reasonable measure of precaution to protect some part of the Delivery not taken over yet, against loss or damage, irrespective to the reason.
- 11.2 In compliance with these Conditions of Contract, all losses and damages to any part of the Delivery not taken over yet, occurred or caused by the Supplier or due to non-fulfilment of any Supplier's obligation, as per Clause 11.1, shall be reimbursed or repaired at the Supplier's expense.
- 11.3 In case of losing the equipment or damages to the equipment caused by the reasons for which the Supplier is not responsible under the Contract, the Supplier shall reimburse and reinstate the same, if required by the Employer, and shall collect these expenses from the Employer at the price to be established by mutual consent. Such expenses shall be added to the Contract price.
- 11.4 The Supplier shall indemnify the Employer for all the claims due to the damages and accidents occurred prior to Delivery of the equipment and the installation works, incurred by any person or property and caused by:
- a) Work of the Supplier
 - b) Incorrect design, except for those designs prepared or submitted by the Employer and for which the Supplier has rejected in writing the responsibility, prior to commencement of the Delivery
 - c) Due to inadequate equipment and material used for execution of installation works
- 11.5 If during the time while the Supplier is repairing the defects at the Site in the Warranty Period, the damages or accidents caused by the Supplier as described in the Clause 11.4 occur, the Supplier shall reimburse the Employer for the amount of the incurred damage.
- 11.6 The Supplier shall not be responsible to the Employer for any damage or accident caused by or derived from the actions or omissions of the Employer or the other persons not employed with the Supplier.
- 11.7 The Supplier shall indemnify the Employer for all suits, claims, costs and expenditures (except those that can be attributed to the Employer, his

representatives and employees), related to the injuries incurred by the persons employed with the Supplier.

- 11.8 The Supplier shall be responsible for application of safety measures at work and fire-fighting regulations.

12. INSURANCE

The Supplier will provide the insurance of the Delivery or part of the Delivery, from the moment of loading in the factory to the unloading of the Delivery or part of the Delivery to warehouse of PSP "Bajina Bašta".

13. PACKING

- 13.1 The Supplier shall envisage such packing which will prevent damaging during the Transport to the Site, including local transport from storage area to the installation room.

Packing shall be such as to withstand without limitation rough handling and exposure to high and low temperatures, salt and open-air storing during the Transport.

Transport dimensions and masses shall be in conformity with the conditions of the transport route to the Site, i.e. to the location of execution of the installation works, as well as in compliance with possibilities for handling of the heavy equipment at all reloading locations.

- 13.2 Marking and documents, inside and outside of the transportation crates, shall be in compliance with Clause 14 of these General Conditions of Contract, as well as in accordance with the Employer's instructions.

14. TRANSPORT

- 14.1 Transport of the equipment and the material with insurance during the transport, shall be the Supplier's obligation.

Transport includes transportation of the equipment from the place of Taking-over from the Supplier up to the Site, i.e. up to the storing location, including unloading.

- 14.2 The Supplier shall prepare the Transport Schedule based on data he procures himself concerning the possibilities for transportation of major cargos (road transport, railway transport, etc.), as well as concerning the capacities of reloading stations, bridges and culverts on the roads, and he shall in all details comply with the current regulations.

The Transport Schedule shall be subject of the Employer's consent.

- 14.3 The Supplier shall dispatch the materials and the equipment necessary for the Delivery or the part of the Delivery, after obtaining of the Employer's consent, in compliance with the Transport Schedule.

To obtain the Employer's consent for dispatching, the Supplier shall notify all necessary data in an appropriate manner and this notification shall contain at least: quantities, description of materials, equipment etc., and information on successfully performed workshop tests, means of transportation and loading and reloading places.

- 14.4 After obtaining the Employer's consent, the Supplier can start the Transport, with the obligation to submit to the Employer and the Insurer the following:
- Bill of Loading
 - Packing list, with a list of the contents of each package
 - Insurance policy
 - Workshop Test Certificate/Test Protocol with workshop test results, issued in compliance with the Technical Specifications

15. CUSTOMS DUTIES

- 15.1 The Supplier is obliged to provide the export licence and the other permits, as well as to perform the export customs formalities and pay all the duties, taxes and other expenses which have to be paid for export of the goods.
- 15.2 If necessary, the Employer shall assist the Supplier to provide all customs documents for the Delivery.

16. ENGINEER

- 16.1 The Employer can engage or appoint the Engineer to perform the jobs related to examination and approval of the documentation, supervision, testing, etc. with regard to the Delivery, during implementation of the Contract.
- 16.2 Whenever, during implementation of the Contract, it is required that the Engineer acts in such a manner as:
- a) To make his own decisions, to give his opinion or consent
 - b) To express his satisfaction or approval
 - c) To establish the value
 - d) To take the actions in any other way, this might have influence on the rights and obligations of the Employer or the Supplier

he shall act at his own discretion, impartially within the Conditions of the Contract, taking into consideration all the circumstances.

Unless expressly stated in the Contract, the Engineer shall have no authority to release the Supplier from any his responsibility under the Contract.

- 16.3 The Supplier shall enable the Engineer to perform the inspection of the equipment in the workshop and at the Site, at any time and under any conditions.
- No other person except the Supplier and his Sub-Suppliers shall have the access to the Site, except with the Engineer's permission.
- 16.4 The Supplier shall act in accordance with the decisions and instructions given by the Engineer in compliance with these Conditions of Contract.
- 16.5 The Supplier can ask the Engineer to confirm in writing each decision or instruction given by the Engineer verbally. In that case, such decision or instruction shall not be valid until the Supplier receives the written confirmation of the same.

- 16.6 If the Supplier contests or has doubts about any decision or instruction as per Clause 16.4 or about the written confirmation as per Clause 16.5, he shall inform the Engineer accordingly, within 7 (seven) days after receiving the same, stating his reasons for that.

Within 7 (seven) days at the latest, the Engineer shall notify to the Supplier and the Employer accordingly, mentioning his reasons and he shall confirm, cancel or change such decision or instruction.

If the Supplier disagrees with the action taken by the Engineer, or if the Engineer fails to respond to the notification of the Supplier, within the established term of 7 (seven) days and if the situation can not be resolved by mutual agreement, then the Supplier shall be free to submit the case to competent Commercial Court in Užice, Republic of Serbia, in compliance with the Contract. However, the Supplier shall immediately act in accordance with the Engineer's decision, without waiting for decision of the above mentioned Commercial Court.

- 16.7 Each vagueness, ambiguity or difference between the Contract documents shall be resolved by the Engineer, who shall inform the Supplier accordingly.

If the Supplier considers that acceptance of such instructions shall result in any costs which the Supplier could not reasonably foresee, he shall inform the Engineer accordingly, stating all the supporting evidences. If he approves it, the Engineer shall then confirm such reasonable cost, together with the profit, where acceptable, and this shall be added to the Contract price.

If, on the other hand, acceptance of such instructions would result in decreasing of costs to the Supplier, the Engineer shall confirm reduction of the Contract price, allowing the profit, where acceptable.

- 16.8 By the Variation Order given to the Supplier at any time, but prior to Taking-over of the Delivery, the Engineer can instruct the Supplier to change, correct, delete or add to the scope of the Delivery, or to modify any part of the Delivery in any other way.

The Supplier shall not modify or alter any part of the Delivery, except as in compliance with the Engineer's Variation Order. However, at any time the Supplier can propose the variations to the Delivery to the Engineer.

- 16.9 Prior to any Variation Order as per Clause 16.8, the Engineer shall inform the Supplier about the nature and the form of such variation.

After receiving such notice, as soon as possible, the Supplier shall submit the following to the Engineer:

- a) Description of work to be performed, if any, with a schedule for its execution
- b) The Supplier's proposal for any necessary modifications or any obligations of the Supplier in compliance with the Contract
- c) The Supplier's proposal for correction of Contract prices

After receiving the Supplier's proposal and after consultations with the Employer and the Supplier, the Engineer shall decide as soon as possible, whether the variations shall be executed.

If the Engineer decides to carry out the variations, he shall issue the Variation Order in which these modifications shall be clearly designated, in accordance with the

Supplier's proposal or in compliance with the proposal which was modified by the mutual agreement between the Engineer and the Supplier.

- 16.10 After receiving the Variation Order, the Supplier shall immediately continue with execution of the variations and he shall be obliged to act in accordance with that Variation Order, as if these variations were set in the Contract.

17. INSPECTIONS

Inspection activities at the Site shall be performed by the Inspector, in compliance with the current regulations in the Republic of Serbia.

18. OPERATION AND MAINTENANCE INSTRUCTIONS AND TRAINING OF EMPLOYER'S PERSONNEL

- 18.1 The Supplier is obliged to prepare and submit Operation and Maintenance Instructions in all details in accordance with the requirements from the Technical Specifications and with the Employer's consent.
- 18.2 The Supplier is obliged to perform training of the Employer's personnel for operation and maintenance during the period of operation and maintenance. The training shall be performed in accordance with the Program of training to be made by the Supplier and with which the Employer agreed, in compliance with the Technical Specifications.

The costs of training and accommodation expenses at the Supplier's Training Centre shall be borne by the Supplier. The travel expenses shall be borne by the Employer.

19. TESTS

- 19.1 Tests shall be performed in accordance with the Technical Specifications and the Detailed Testing Schedule. To establish whether they are in compliance with the Contract requirements, the Employer has the right to perform himself testing of the Delivery.
- 19.2 Tests shall be performed at the Supplier, at his Sub-Suppliers and at the Site, until expiration of successful Trial Run. When tests are performed at the Supplier or at his Sub-Suppliers, all reasonable favourable conditions and assistance, including access to drawings and manufactures technical data, shall be made available to the Engineer free of charge.
- 19.3 If the inspected or tested part of the Delivery is not in compliance with the Contract and Technical Specifications, the Engineer can reject it and the Supplier's obligation shall be to make, at his cost, the appropriate repairs or replacements, necessary to fulfil the requirements of the Technical Specifications.
- 19.4 Until expiration of successful Trial Run, the Engineer can require repeating or extending of the scope of testing of any part of the Delivery and the Supplier is obliged to perform them. If the results of such repeated or additional tests show that the subject part of the Delivery has been carried out in accordance with the Contract, all costs shall be borne by the Employer. If it is found out that such part of the Delivery has not been carried out in accordance with the Contract, the costs shall be borne by the Supplier.

- 19.5. Everything mentioned in this Clause, in any way, shall not release the Supplier from the warranty or any other obligations under this Contract.

20. COMMISSIONING TESTS

- 20.1 After completion of Installation works, the Supplier shall notify the Employer that, in the sense of the Technical Specifications, he is ready for the Commissioning Tests and he shall issue the Certificate of Readiness for Commissioning Tests.
- 20.2 The scope and method of Commissioning Testing are defined by the Technical Specifications and the Detailed Testing Schedule.
- 20.3 The Commissioning Tests can commence on the basis of the Employer's and the Supplier's written agreement and it commences with the date as defined in this agreement.
- 20.4 The Protocols shall be prepared for all the performed tests and these protocols shall be signed by the Employer and the Supplier's authorized person.
- 20.5 Manual operation during the Commissioning Tests shall be performed by the Supplier's personnel, in the presence of the Employer.
- 20.6 After successful completion of the Commissioning Tests, the Supplier and the Employer shall prepare the relevant Protocol.

21. TRIAL RUN

- 21.1 The scope and the method of testing during the Trial Run are defined by the Technical Specifications and the Detailed Testing Schedule.
- 21.2 Duration of the Trial Run shall be 30 (thirty) days and it shall be performed by the Supplier's personnel with the Employer's consent.
- 21.3 During the Trial Run the equipment shall operate continuously for 30 (thirty) days, meaning that during that period no interruptions must occur due to the defects. If the interruption occurred during the continuous operation, the duration of the continuous operation shall be calculated from the date of the last putting into operation.
- 21.4 If due to failures during the Trial Run the interruptions occur, the period of Trial Run shall be extended for the duration of such interruptions. Short-lasting interruptions, for possibly necessary fine tuning-up and adjustments shall not be calculated in such interruptions.
- The duration of all these short-lasting interruptions during the Trial Run shall not exceed a total of 48 hours.
- 21.5 If the interruptions are unusually frequent, or if continuation of the Trial Run represents any kind of danger, the Employer has the right to interrupt the Trial Run, after he notifies the Supplier accordingly. In that case the Employer shall determine to the Supplier the time limit to reinstate the Delivery as required by the Contract. After repeated putting into operation, the duration of the Trial Run is calculated from that date.
- 21.6 The Supplier shall perform at his own cost all the adjustments and repairs during the Trial Run.

- 21.7 During the Trial Run the Supplier provides necessary material, in the quantities necessary for normal operation.
- 21.8 During the Trial Run the Supplier shall train the Employer's personnel, explaining the Operation and Maintenance Instructions to them.

22. PRELIMINARY TAKING-OVER

- 22.1 If the Employer has no justified remarks, after completion of Trial Run, the Preliminary Taking-over shall be carried out.
- 22.2 Preliminary Taking-over shall be carried out by the Expert Committee to be established by the Employer and the Supplier, nominating the equal number of members and the Chairman is to be selected by mutual agreement. The Expert Committee notes the Preliminary Taking-over by the respective Protocol.
- 22.3 Preliminary Taking-over consists of Technical Acceptance and Settlement.
- 22.4 The Technical Acceptance of the Preliminary Taking-over consists of:
- a) Quantitative Acceptance of the Delivery, in compliance with the Contract and Technical Specifications
 - b) Qualitative Acceptance of the Delivery, which comprises:
 - Confirmation of the guaranteed and technical characteristics for the purpose of verification of the values stated in the Technical Specifications
 - Testing of correct operation of the Delivery
- 22.5 The scope and the method of testing are determined in the Technical Specifications and in the Detailed Testing Schedule and are to be performed by the Supplier's experts and devices, in the presence of the Employer.
- 22.6 The activities and the results during the Preliminary Taking-over, the Expert Committee notes by the Protocol indicating all possibly necessary adjustments and repairs.
- 22.7 The tests performed prior to the Preliminary Taking-over can be accepted as a part of the Qualitative Taking-over within the Technical Acceptance, if the Employer agrees with it.
- 22.8 If the tests show that the Delivery operates irreproachably, but it does not satisfy the values of technical characteristics, the Preliminary Taking-over shall be postponed and the appropriate time limit shall be determined to the Supplier for the repairs, adjustments and repeated tests.
- 22.9 If the results of repeated tests do not satisfy the values of technical characteristics, with the prescribed tolerances, the Employer has the right to reject the acceptance of the Delivery.
- 22.10 If the results of repeated tests are such that any of the Contractual Parties do not agree with them, new tests shall be performed. For these tests, the Employer shall nominate the qualified institution that was not included in testing until then and the costs of such testing shall be borne by the Contractual party which was wrong.

- 22.11 After completion of the Technical Acceptance during the Preliminary Taking-over, the Expert Committee shall prepare the Settlement in compliance with the Contract, based on the entire documentation related to performance and inspection of the Delivery.

23. WARRANTY PERIOD AND FINAL TAKING-OVER

- 23.1 The Supplier guarantees that the entire Delivery as a whole shall be in compliance with the Technical Specifications and other provisions of the Contract.
- 23.2 The Warranty Period shall last not shorter than 24 months after Preliminary Taking-over, i.e. not shorter than 36 months from the Delivery date, whereas the Warranty Period for anticorrosion protection shall last 60 months from commencement of permanent operation.
- 23.3 Up to expiration of the Warranty Period, the Supplier shall be obliged to carry out all repairs, modifications, adjustments and regulations necessary for fulfilling the requirements from the Contract, as well as to replace all the parts and the equipment for which it shall be established to be defective.
- 23.4 If the established defect occurred because of incorrect structure of the part of Delivery, the Supplier is obliged to eliminate defects on all other parts of Delivery, which, considering their application, have the same incorrect structure, even if no failure occurred on them.
- 23.5 During the Warranty Period, the Supplier shall remain obliged, if necessary and upon explained request of the Employer, to bring again to the Site the personnel necessary for fulfilling of his obligations from the Warranty Period.
- 23.6 If it proved to be necessary, the Employer shall send the written invitation to the Supplier for elimination of defects, and the Supplier shall be obliged to start with elimination of the defects within 2 days after receipt of the invitation at the latest.
- 23.7 The Supplier is obliged to perform all obligations from the Warranty Period as fast as possible, taking into account the exploitation requirements.
- 23.8 If the Supplier, although invited, fails to commence eliminating of the defects within the previous mentioned period, the Employer can either by himself or by means of the third persons, commence eliminating of the defects, without the Supplier's agreement and at the expense of the Supplier.
- 23.9 The Supplier shall not be responsible for the repairs, adjustments and replacements, undertaken without written consent of the Supplier, either by the Employer or by the third person under his order, except if the Supplier didn't respond to the Employer's request.
- 23.10 If during the Warranty Period the Delivery or part of the Delivery cannot be used due to the defects for which the Supplier is responsible, the Warranty Period for them shall be extended for the period during which they were out of use.
- 23.11 If during the Warranty Period it would be necessary to replace some element due to functional defect, the Warranty Period for this element shall run from its replacement, regardless of the fact whether stoppage in operation occurred or not.
- 23.12 Until expiration of the Warranty Period the Supplier shall bear all the costs of replacement, repairs, modifications, adjustments and regulations, transport, except

the costs occurring due to negligence of the Employer's personnel or because the operation was not carried out in compliance with the Operation and Maintenance Instructions.

23.13 One month prior to expiration of the Warranty Period, possibly extended in compliance with the Conditions of Contract and after the Supplier eliminates all the defects found out earlier, the Supplier shall request in writing to commence the Final Taking-over and he shall issue the Final Certificate of Payment.

23.14 After the Supplier's request, an Expert Committee shall be nominated to perform the Final Taking-over, consisting of Technical Acceptance and Final Payment Calculation. The Expert Committee shall be nominated and shall perform all the activities as for the Preliminary Taking-over.

Final Settlement is a Report in which, among other things, it is stated to which extent the remarks and defects which occurred during the Defects Liability Period have been eliminated. If all remarks have been eliminated or reduced to the technically acceptable minimum, the Final Settlement implies returning of the Performance Security.

23.15 The Employer can request, among other things, all the tests to be performed as for the Preliminary Taking-over. The scope and method of testing are defined in the Technical Specifications and Detailed Testing Schedule. The results of these tests have to meet the required values, provided that the equipment was used in compliance with the Operation and Maintenance Instructions.

23.16 If the tests prove that the Delivery is perfectly operating, but it does not satisfy the guaranteed characteristics and the technical characteristics, the Final Taking-over shall be postponed and an appropriate time limit for the repairs and adjustments, as well as for the repeated tests, shall be determined to the Supplier.

23.17 If the results of the repeated tests do not satisfy the guaranteed characteristics and the technical characteristics, with the prescribed tolerances, the Employer shall have the right to reject Taking-over of the Delivery.

23.18 If the results of the repeated tests are such that any of the Contractual Parties do not agree with them, the new testing shall be performed. For these tests, the Employer shall nominate the qualified institution that was not included in testing until then and the costs of such testing shall be borne by the Contractual party which was wrong.

23.19 If because of necessity of utilization of the equipment, the Final Taking-over shall not be completed within one month from the Supplier's request, the additional direct costs shall be borne by the Employer.

24. VARIATIONS OF DELIVERY

24.1 The Employer can at any time request in writing from the Supplier the variations within the contracted scope of Delivery.

24.2 The Supplier shall eliminate each hidden deficiency of the Tender or the Technical Solution in the Tender.

24.3 All variations and supplements, to this effect, shall be exclusively in writing, signed by both Contractual Parties.

25. DEADLINES FOR DELIVERY AND DELAYS

- 25.1 The Supplier shall be obliged to start, perform and complete the Delivery within the deadlines envisaged in the Preliminary Time Schedule presented within the Tender Documents for purchasing of the equipment which is the subject of Delivery. No later than 15 (fifteen) days after signing of the Contract, the Supplier shall submit a Detailed Time Schedule of the activities intended for implementation of the Contract, adhering to the deadlines stated in the Contract and in the Tender.
- 25.2 Unjustified delay of the Supplier in performing the obligations under the Clause 25.1 can have the following consequences:
- Collecting of Performance Security
 - Termination of the Contract for default
- 25.3 If at any time during performance of the contractual obligations the Supplier or his Sub-Supplier shall be faced with conditions jeopardizing timely execution of their contractual obligations, the Supplier shall immediately notify the Employer in writing, about the causes, reasons and probable duration of such delay. Upon receipt of such notification, the Employer shall evaluate the situation within the shortest possible term and at his own judgment, he can extend time limit to the Supplier.

The extension of time limit for execution of the contractual obligations shall be noted by the Appendices to the Contract.

26. TERMINATION OF CONTRACT FOR DEFAULT

- 26.1 Without effect on application of other sanctions due to failing to observe the Contract, the Employer has the right to terminate the Contract in writing, if:
- a) The Supplier is not performing the contractual obligations, within the time limits envisaged by the Contract or within the extended time limit, as per Clause 25.
 - b) The Supplier shall not perform any obligation under the Contract
 - c) The Supplier, in any of the circumstances mentioned under a) and b) above, within the period of 30 days or within some longer period approved in writing by the Employer, shall not surpass the non-fulfilment, i.e. does not continue to fully execute the contractual obligations.

27. FORCE MAJEURE

- 27.1 Force Majeure cases are natural events or other events beyond the control of the Supplier, such as: war status, revolution, terrorist threats, earthquake, fire, flood, large-scale epidemics, quarantine restrictions, embargo on transport and all others occurrences which can endanger safety of human and means, and can not be predicted in advance.
- 27.2 If the delay and other non-fulfilment of the obligations under the Contract is a result of Force Majeure, the Supplier shall not be faced with collecting of Performance Security or termination of the Contract for default.
- 27.3 In case of Force Majeure, the Supplier shall immediately notify the Employer in writing about the conditions and reasons of such event. If the Employer does not determine otherwise in writing, the Supplier shall continue with fulfilment of the contractual obligations, if it makes any sense, and shall look for all reasonable

possibilities to continue with implementation of the parts of Delivery that are not jeopardized by the Force Majeure.

28. CONTRACT TERMINATION FOR INSOLVENCY

If the Supplier becomes bankrupt or becomes insolvent in any other way, the Employer can at any moment, notifying the Supplier in writing, terminate the Contract without any compensation to the Supplier.

29. SETTLEMENT OF DISPUTES

The Employer and the Supplier shall make all the efforts to resolve amicably all disagreements and disputes arising during implementation of the Contract. If they shall not start to resolve and they don't resolve the disputed issues within 30 days, each of the Contractual Parties can submit the dispute for resolution to the competent local institution (Commercial Court in Užice, the Republic of Serbia).

30. GOVERNING LAW

The Contract shall be interpreted in accordance with the laws of the Republic of Serbia.

PART II: CONTRACT MODEL

C O N T R A C T

Concluded between:

PE Electric Power Industry of Serbia - EPS
Carice Milice 2,
11000 Beograd
Branch DRINSKO - LIMSKE HPPs
Trg Dušana Jerkovića 1
31250 Bajina Bašta
Tel + 381 (0)31 863 866
(hereinafter referred to as: **Employer**), on one side and

(hereinafter referred to as: **Supplier**) on the other side

SUBJECT OF THE CONTRACT

Article 1

The Contractual Parties have agreed that for the requirements of the Employer, the Supplier shall perform Delivery and Technical services for PSPP "Bajina Bašta":

- 1. Delivery of the equipment for PSPP "Bajina Bašta":**
 - 1.1. Governor for units No.1 and No.2**
 - 1.2. Automatic Frequency Control (AFC) and Power Joint Control (JC)**
- 2. Technical Services for Governor, AFC/JC Rehabilitation**

on Site of Employer, in all details in accordance with the Supplier's Tender No. _____ dated _____, as well as in compliance with the Technical Characteristics stated in it, which make an integral part of this Contract.

PRICE

Article 2

Contracted price for the Delivery specified in the Article 1:

- 1. Delivery of the equipment for PSPP "Bajina Bašta"**

for the total amount of _____, i.e.

(in figures)

(in words)

For domestic Supplier the parity of Delivery is: delivered at PSPP “Bajina Bašta site” in Perućac, excluding VAT.

For foreign Supplier parity of Delivery is: DAP HPP “Bajina Bašta” Perućac, INCOTERMS 2010.

2. Technical Services for Governor, AFC/JC Rehabilitation

for the total amount of _____, i.e.

(in figures)

(in words)

The above total amount of price for Technical services are based on Volume 5. Schedule of prices and Volume 6. Preliminary Project schedule of this Tender documents.

If the schedule is extended due to causes attributable to the Purchaser, additional cost shall be charged, according to unit prices stated in Volume 5. Schedule of prices.

If the schedule is shortened, the price shall be paid by actual man-day and overtime.

TIME LIMITS

Article 3

Time limit for the Delivery specified in the Article 1 of this Contract is _____ (up to 270) calendar days from the date of the Contract coming into force.

The Employer reserves the right to terminate the Contract unilaterally, in case of non-fulfilment of the time limit from the paragraph 1 of this Article, without the Supplier's right to be compensated.

On written request of the Supplier, the Employer can extend the time limit from the paragraph 1 of this Article. During the extended time limit the Employer reserves the right to collect the liquidated damages as defined in the Article 4 of this Contract.

Time limit is considered to be the essential component of this Contract.

LIQUIDATED DAMAGES

Article 4

If the Supplier due to irregular fulfilment of the Contractual obligations by his blame or negligence exceeds the time limit fixed under the Article 3 of the present Contract, with exception of the cases specified in the Article 5 of this Contract, the Supplier shall be obliged to pay to the Employer the liquidated damages in the amount of 2‰ (two per thousand) of the total Contracted price for each day of the delay, but the total amount of these liquidated damages cannot exceed 5% (five percent) of the total Contracted price from the Article 2 of the present Contract. In that case, the Supplier is due to compensate the actual damage.

Article 5

The Supplier is entitled to extend of the time limit from the Article 3 of this Contract in case of Force Majeure act, as well as in case of no fulfilment of the obligations by the Employer.

The Contracted time limit specified in the Article 3 of the present Contract shall be extended in the cases mentioned in the paragraph 1 of this Article, for duration of the hindrance and this is to be mutually established by the authorized representatives of the Contracted parties.

SUPPLIER'S OBLIGATIONS

Article 6

The Supplier undertakes the following obligations:

1. To submit the Performance Security to Employer in the amount of 5% of total Contracted price specified in the Article 2, Item 1 of this Contract, within ten days from the date of mutual signing of the Contract,
2. To notify the Employer about the term for the Factory Acceptance Tests, four weeks prior completion of manufacturing of **equipment which is subject of Delivery**,
3. To perform tests envisaged to be performed on each piece of **equipment which is subject of Delivery**, in the presence of the Employer and in compliance of the determined Standards,
4. To repeat any test upon the Employer's request,
5. To perform Delivery of **equipment which is subject of Delivery**, in all details in accordance with the Supplier's Tender No. _____ dated _____, as well as according to the Technical Characteristics stated in it, which make an integral part of this Contract,
6. To submit Test Protocols for Factory Acceptance Tests of **equipment which is subject of Delivery**,
7. To submit required technical documentation and the brochures/leaflets,
8. To submit the Instructions for Maintenance and Operation of delivered **equipment which is subject of Delivery**,
9. To submit As Built documentation for delivered equipment after performing the Commissioning Tests on **equipment which is subject of Delivery**,
10. To perform training of Employer's personel,
11. To perform all other contractual obligations in accordance with the provisions of this Contract

EMPLOYER'S OBLIGATIONS

Article 7

The Employer undertakes the following obligations:

1. To be present during performance of Factory Acceptance Tests of **equipment which is subject of Delivery**
2. To duly pay out to the Supplier the delivered **equipment which is subject of Delivery and performed Technical services**, in a manner and within the time limits as defined in the Article 8 of this Contract
3. To perform all other contractual obligations in accordance with the provisions of this Contract

MODALITY OF THE PAYMENT

Article 8

The Employer undertakes the obligation to pay to the Supplier the advance payment in the amount of _____ % (up to 20%) of the Contracted price for Item 1. Delivery of the equipment, specified in the Article 2 of this Contract, within 45 (forty five) days from the date of submission of the advance account, with prior submission of the bank Advance Payment Guarantee to the amount of the advance payment.

The Employer is obliged to pay to Supplier the amount of 85% of Contracted price for Item 1. Delivery of the equipment, specified in the Article 2 of this Contract reduced for advance payment amount, within 45 (forty five) days from date of Delivery, i.e. latest part of Delivery of **equipment which is subject of Delivery** to the Site (Peručac - warehouse of HPP "Bajina Bašta"), after receiving of Supplier's Invoice.

The remaining amount of the Contracted price for Item 1. Delivery of the equipment, specified in the Article 2 of this Contract, the Employer shall pay to the Supplier on the basis of the Settlement, after Preliminary Taking-over of **equipment which is subject of Delivery**, documented by the Protocol, within 45 (forty five) days from the date of receiving of the Supplier's Invoice.

The Employer is obliged to pay to Supplier performed Technical services based on actual man-day and overtime hours and unit prices stated in Volume 5. Schedule of prices, within 45 (forty five) days from the date of receiving of the Supplier's Invoice.

The Employer shall effect all payments to the Supplier's Giro Account No. _____ which has been opened with _____.

ACCEPTANCE OF EQUIPMENT WHICH IS SUBJECT OF DELIVERY

Article 9

It shall be considered that the Supplier delivered to the Employer **equipment which is subject of Delivery** specified in the Article 1 of this Contract, when the Expert Committee prepares the report about Final Taking-over with the conclusion that **equipment which is subject of Delivery** are finally accepted.

The Employer is obliged to submit to the Supplier the possible remarks of the Expert Committee, within 5 (five) days from the date of preparation of the report specified in the previous paragraph of this Article.

The Supplier is obliged to eliminate the possible defects on **equipment which is subject of Delivery**, in compliance with the remarks of the Expert Committee, within 10 (ten) working days at the latest, after the date of receiving the written remarks concerning these defects.

In case the Supplier does not eliminate defects within 10 (ten) working days, in accordance with the remarks of the Expert Committee, the Supplier is obliged to replace **equipment which is subject of Delivery** with the new **equipment which is subject of Delivery** in good order.

MISCELLANEOUS PROVISIONS

Article 10

Modifications and additions to the present Contract can be made only with mutual consent of the Contractual Parties, in the form of the Annex to the Contract.

In case of breaking of the Contract which might possibly occur with the mutual consent of the Contractual Parties, the parties to the contract shall compensate to each other the possible damages caused by breaching of the Contract.

Article 11

The Contractual Parties shall resolve all possible misunderstandings amicably, through the agreement of their authorized representatives. If it will not be possible to resolve the possible disputes in a previously mentioned manner, the arisen disputes shall be resolved by the Commercial Court in Užice, Republic of Serbia.

Article 12

An integral part of this Contract is: The Supplier's Tender No. _____ dated _____, with the Technical Characteristics stated in it and accepted by Employer.

Article 13

The present Contract comes into force by the date of its signing of both Contractual Parties.

Article 14

The present Contract has been made in 6 (six) identical copies, that means 3 (three) copies for each Contractual Party.

SUPPLIER

General manager,

**PE Electric Power Industry of
Serbia**

Branch DRINSKO - LIMSKE HPPs

General Manager,

PART III: FORMS

TENDER

PE Electric Power Industry of Serbia - EPS
Carice Milice 2, 11000 Beograd
Branch DRINSKO - LIMSKE HPPs
Trg Dušana Jerkovića 1, 31250 Bajina Bašta

| DATA RELATED TO TENDERER | |
|---|--|
| Name of Tenderer | |
| Head-office of Tenderer | |
| Responsible person (Signer of Contract) | |
| Contact person | |
| Phone No. | |
| Fax No. | |
| E-mail address | |
| Current account of Tenderer | |
| Registry number of Tenderer | |
| Tax identification number of Tenderer | |

Venue and date

TENDERER

LS

Signature

Name, surname, position

As the evidence of the above mentioned conditions that the **legal entity or natural person** should satisfy in accordance with the Invitation to the Tenderers, the Tenderer submits the following documents:

1. Excerpt from Register No. _____ of _____
2. Certificate of the competent court No. _____ of _____
3. Certificate confirming that the measure of prohibition of performance of activities has not been imposed No. _____ of _____, or
Declaration signed by the company representative and certified by competent authority for lack of circumstances preventing the bidder from performing economic activity by any measure No. _____ of _____,
4. Certificate No. _____ of _____,
5. Audited balance sheets or copies of financial statements with confirmation of receipt of their originals by the tenderer's tax authorities for the last four (4) years,
6. Reference list which Supplier certificate rehabilitation of at least five (5) turbine governors, electric (regulator) and hydraulic (actuator) part, within the last three years, counting from the date of publishing of the Invitation.

Venue and date

TENDERER

LS

Signature

Name, surname, position

Remarks:

All the documents and photocopies have to be signed, certified and not older than six (6) months. Failing to submit any of the required documents, entitles the Employer to evaluate the Tender as incorrect.

After we have studied the Tender Documents as defined in the part of the Instructions to Tenderers and its modifications and additions presented in the Annexes No. _____ (indicate numbers) hereby we offer, within the required time limits and under the mentioned conditions, to perform:

1. Delivery of the following equipment for PSPP “Bajina Bašta”:

1.1. Governor for units No.1 and No.2

1.2. Automatic Frequency Control (AFC) and Power Joint Control (JC)

for the total amount of _____, i.e.

(in figures)

(in words)

2. Technical Services for Governor, AFC/JC Rehabilitation

for the total amount of _____, i.e.

(in figures)

(in words)

These total amounts results from the Schedule of Prices, enclosed to the Tender, which makes the integral part of this Tender.

If our Tender will be accepted, we undertake the obligation to perform the entire Delivery, within _____ days, counting from the date of Contract comes into force, and Technical Services for Governor, AFC/JC rehabilitation within _____ days from date of receiving the entire Delivery on the Site of Employer.

If our Tender will be accepted, for Delivery in compliance with Contracted Price and time limits, We request advance payment in the amount of _____ % of Contracted Price of Article 2, Item 1 and we provide appropriate bank guarantee, in compliance with Tender Documents.

If our Tender will be accepted, we shall provide Performance Security for the maximum amount of 5% of Contracted Price stated in Article 2, Item 1, according to the Performance Security form.

We agree the validity of our Tender to be _____ days (minimum 90 days), counting from the date fixed for Tender opening, stated in the Invitation to Tenderers.

We agree that you are not obliged to accept the Tender with the lowest price or any other Tender that was submitted to you.

We certify all the data presented in the Tender by our seal and signature.

As attachment to the Tender we submit following technical and contractual documents, as integral part of our Tender:

(state the contents of documents)

Venue and date

LS

TENDERER

Signature

Name, surname, position

TENDER SECURITY

Herewith we declare that we

_____ (full name of the Tenderer)

(hereinafter referred to as: Tenderer)

with the head office in _____ and

_____ (full name of the Bank)

(hereinafter referred to as: Guarantor), with the head office in _____ which operates in all details in compliance with the positive laws of our country, commonly and irrevocably obliged towards **PE Electric Power Industry of Serbia, Branch DRINSKO - LIMSKE HPPs**, (hereinafter referred to as: the Employer) for the amount of

_____ and _____.

(in figures)

(in words)

For payment of this amount, we irrevocably and unconditionally bind ourselves, our successors, executors and administrators, jointly and individually.

The conditions of this obligation originated from the fact that on the date _____ the Tenderer submitted to the Employer the Tender for: _____

(state the subject of the Tender)

were the Employer requested, as the condition for taking the Tender into consideration, that the Tenderer submits the Tender Security, amounting of 200.000 EUR.

- If the Tenderer withdraws his Tender during the period of validity of the Tender (which the Tenderer indicated in the Tender form), or
- If the Tenderer would be selected as the successful Tenderer and the Employer sends a written request to the Tenderer to conclude with him the Contract for execution of the Delivery, being the subject of the Tender, and the Tenderer fails to send the authorized representative within the time limit as determined in the Tender Documents to sign the Contract, or
- If the Tenderer fails to submit the Performance Security within the defined time limit,

the amount of this Tender Security shall be immediately paid to the Employer, upon his first request and without litigation, not excluding the Employer's right to request from the Tenderer to compensate him all the damages that occurred thereby.

If the Tenderer acts in all details in accordance with the provisions of the Tender Documents and concludes the Contract with the Employer in compliance with the submitted Tender and if the Tenderer submits the Performance Security, the Employer shall return the Tender Security to the Tenderer by registered or courier mail, whereas the obligations from this Tender Security shall be replaced by the Performance Security.

This Tender Security shall remain valid up to expiration date of Tender validity and any request for payment related to this Tender Security must reach the Guarantor within prior mentioned period.

The Tenderer and the Guarantor have accepted commonly all details the obligations and conditions from this Tender Security and they have put their seals and signatures on this document on the date _____.

This document was duly signed by the below mentioned authorized representatives.

Venue and date

LS

TENDERER

Signature

Name, surname, position

Venue and date

LS

GUARANTOR

Signature

Name, surname, position

STATEMENT OF SUBMISSION OF BANK GUARANTEES

Referring to the Invitation for Award of the Contract for for Public Procurement of goods No. JN VV-BB 28/2015 – Purchasing of the Turbine Governor for Units No.1 and No.2 at PSPP “Bajina Bašta” in the open procedure, we irrevocably state that in case of Contract award to the Tenderer: _____,

(full name of the Tenderer)

under the subject Public Procurement, we will submit to the Employer within the contracted deadline the following irrevocable and unconditional bank guarantees collectable at first request:

- 1) Advance Payment Security for the amount of the requested advance payment, and
- 2) Performance Security for the amount of 5% (five percent) of the of Contracted Price stated in Article 2, Item 1.

Venue and date

LS

GUARANTOR

Signature

Name, surname, position

REFERENCE

References shall be listed in the Table of References prepared in the following form:

| No. | Subject of Delivery | Number of Delivered Units | Name of Ultimate User | Contact Person of Ultimate User | Address, Telephone Number and e-Mail of Ultimate User | Subject of Delivery in operation since (date) |
|-----|---------------------|---------------------------|-----------------------|---------------------------------|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Adequate certificate issued by the relevant Employer shall be submitted for each stated reference.

In the column “Number of Delivered Units”, an appropriate unit of measurement should be added in the header of the column.

TABLE OF DEVIATIONS

(To be filled-in by the Tenderer)

| CLAUSE | DESCRIPTION OF DEVIATIONS FROM THE REQUIREMENTS OF TENDER DOCUMENTS | VARIATION OF PRICE (INCREASE OR REDUCTION) |
|--------|---|--|
| | | |

VOLUME 2: GENERAL TECHNICAL SPECIFICATIONS

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1 GENERAL INFORMATION

1.1 General

“Bajina Bašta” Pumped Storage Plant (abbreviated PSP) has two pumped storage units (M/G) each with powers of 310/315 MW/MVA. It is located approximately 300 m downstream from HPP “Bajina Bašta” and it was commissioned in 1982.

Upper reservoir (with the head of 525 m to 610 m) is located in Mount Tara and lower reservoir uses the reservoir of the existing hydropower plant. The maximum static head for the pumping regime amounts to 620 m.

The upper reservoir of the PSP and the lower reservoir of the HPP are connected on one side by means of a headrace tunnel $l=8000$ m, $D=6.3$ m, inclined penstock $l=738$ m, $\alpha=45^\circ$, $D=4.8$ m and a manifold to the turbines/pumps of units R1 and R2 at the end of the horizontal penstock running into the PSP powerhouse, and on the other side through draft tube and lower pipeline $l=314$ m, $D=7.0$ m, discharging into the lower reservoir of the HPP at the elevation of 248 masl. The maximum discharge through the penstock is $63 \text{ m}^3/\text{s}$ per unit, i.e. $126 \text{ m}^3/\text{s}$.

The basic technical data of PSPP Bajina Basta are listed below:

Pump-turbine

| | |
|---------------------------|------------------------------------|
| - Type | VFR-1RS |
| - Manufacturer | Toshiba |
| - Rated Power P_n | 294/272 MW |
| - Rated speed | $426,8 \text{ min}^{-1}$ |
| - Rated Net head H_n | 554.3/600.6 m |
| - Flow at P_n and H_n | $63/40.5 \text{ m}^3\text{s}^{-1}$ |

Motor-Generator

| | |
|------------------------|----------------|
| - Type | Synchronous |
| - Manufacturer | Toshiba |
| - Rated Power S_n | 315 MVA |
| - $\cos \varphi$ | 1.0/0.95 |
| - Rated Voltage | 11kV $\pm 7\%$ |
| - Rated stator current | 19533/16585 A |

1.2 Governor - Description of Existing Equipment

PSP Bajina Basta Turbine existing governor is electro-hydraulic type.

The hydraulic part (actuator) of Turbine governor is CHS Type (with auxiliary servomotor). Main functions of the actuator are:

1. Convert and amplify the various electrical signals for control, specifically the generator speed deviations, to mechanical displacement,
2. Send this to servomotor by controlling the pressurized oil flow,
3. By servomotor operate the guide vane to control generator speed and its power.

The type, rating and performance of this actuator are as follows:

| | |
|--------------------------------|---------------------------|
| - Type | CHS |
| - Sensitivity | 0.02% |
| - Dead time | 0.25 sec |
| - Normal oil pressure | 50 kg/cm ² |
| - Maximum working oil pressure | 59 kg/cm ² |
| - Permissible pressure | 88.5 kg/cm ² . |

The actuator is set on a bed in the cabinet with consideration for easy maintenance and inspection. It consist of the following parts:

- Control frame
- Converter
- Auxiliary servomotor
- Main distributing valve
- Slow closing device
- Actuator lock device
- Start and shutdown device
- Load limiting device
- Restoring device (electrical)

Electrical part of Turbine governor consist of ΔF amplifier unit (Type FQTO Form 5E), control unit (Type FQTO Form 5EX) and accessories. The ΔF amplifier and control unit are placed in the same cubicle and various settings can be easily carried out at the front side.

The speed is detected by frequency of the permanent magnet generator directly coupled to the generator shaft.

The servomotor stroke is detected by the oil filled potentiometer.

A low ac voltage of the permanent magnet generator is applied to the pilot valve trough the converter coil to remove ill influence of the friction.

The operational amplifier and power amplifier are built into the printed circuit boards to be of plug in type to facilitate inspection.

Rating and performances of the electrical part are as follows:

| | |
|---------------------------|--|
| - Control supply | PMG primary voltage 87-110V, 50Hz |
| - Power consumption | AC 110 V 150 VA |
| - Starting supply | DC 100V, 0.1A Station service supply |
| - Normal operating range | AC 80-140 V at control amplifier supply terminal |
| - Rated frequency | 50 Hz |
| - 65F speed setting range | +/- 10% |
| - 65P load setting range | -50% - +150% (at servostroke) |
| - Drooping setting range | 0 – 10% |

Reference Documents:

| | |
|--|-----------------|
| - Schematic Diagram Unit No.1 and Common | 7K2H0087 |
| - Schematic Diagram Unit No.2 | 7K2H0125 |
| - Instruction for Governor | BB-ME-04 |

- Mechanical Part for Governor **E-6P0039**
- Toshiba Electro-Hydraulic Governor
FQTO-5E System
Electronic Control Amplifiers
System Instruction **EE-7730137**

Following special operations are applied in scope of governor functions:

- Power Joint control (JC), acc. to dwg. **2W2K0200**
- Automatic frequency control (AFC) acc. to dwg. **2W2K0199**.

1.3 Basic Operation and Maintenance problems regarding Governor system - Necessity for rehabilitation

As information, here are mentioned in general some basic operation and maintenance problems, regarding Governor, Power Joint Control and Automatic Frequency Control equipment:

- Ageing of the equipment and very demanding operation of the plant in the last almost 33 years,
- Lack of spare parts, for both Electrical and Hydraulic part of Governor,
- Electrical part of Governor, JC and AFC are based on relatively old technology concept, with employment of operational amplifiers, relay logic and hard wired elements.

Taking into account above mentioned and necessity to increase existing efficiency, reliability and safety of the plant, HPP Bajina Basta has decided to rehabilitate and upgrade Governor system on both Units at PSP Bajina Basta.

1.4 Short Description of the new Governor, JC and AFC

General

Existing analogue type governor regulator and actuator for Unit no. 1 and Unit no.2, Power Joint Control and Automatic Frequency Control of Bajina Basta Pumped Storage Hydroelectric Power Plant shall be removed and replaced by a new digital type governor regulator and updated actuator, JC and AFC.

Scope of supply

The following equipment and components for unit No.1 and unit No.2 shall be rehabilitated:

- (1) Replacement of governors: 1 set for each unit

The existing governor for each Unit located at turbine floor shall be removed and replaced by a new governor comprised as follows:

- (a) Replacement of valve sheets and valve pistons of main distributing valve and slow closing valve mounted in main distributing valve case

- (b) Replacement of converter and control piston
- (c) Replacement of gate opening/closing rate limit mechanism
- (d) Replacement of shutdown mechanism
- (e) Replacement of slow closing mode change valve
- (f) Replacement of following 3 solenoids operated valves for governor
 - Shutdown solenoid valve
 - Oil cut off solenoid valve
 - Emergency shutdown solenoid valve
- (g) Replacement of restoring mechanism for distributing valve and existing servomotors
- (h) Replacement of speed detector from PMG to SSG
- (i) Replacement of whole regulator with new, digital type,
- (j) Replacement of associated components

The existing actuator board, main distributing valve case and stop valve in the case, and channel base for a regulator board shall remain un-replaced and they shall be re-used.

- (2) Replacement of Power Joint Control and Automatic Frequency Control

Existing JC and AFC placed at turbine floor shall be removed and replaced by a new digital type JC and AFC.

(a) The scope of supply shall cover the design, engineering, documentation, manufacture, factory assembly, inspection and testing, pre-commissioning test, commissioning test and training of operators, engineers and maintenance personnel.

(b) All the interface points of the AFC/JC shall be take the form of a terminal block or other connection system.

The Supplier shall provide all prefabricated cables and special cables as required for the supplier's equipment including fiber optical cables with accessories.

(c) The numbers of input/output points shall be provided as sufficient with additional spare of 10 % at least.

2 SITE CONDITIONS

2.1 Altitude

The entire equipment shall be designed for operation at the altitude not exceeding 2000 masl.

2.2 Climate

The Drina river basin, where PSP "Bajina Bašta" is located, has typical continental climate, with changes due to the influence of the surrounding mountains. Practically all precipitations occur in winter season, i.e. from November till April. Frost occurs only exceptionally, from November till March.

Meteorological data to be taken into account within the Delivery are:

- | | | |
|----|---------------------------|----------------------|
| a) | Ambient temperatures: | |
| | Extreme temperatures: | |
| - | Minimum: | -21°C |
| - | Maximum: | 40°C |
| - | Mean annual temperature | 12°C |
| | Average temperatures: | |
| - | Minimum (January, 2006): | -14.75°C |
| - | Maximum (June, 2000): | 33°C |
| b) | Relative humidity | |
| - | Mean maximum (in winter) | 80% |
| - | Mean minimum (in summer) | 40% |
| c) | Mean annual precipitation | 816 l/m ² |
| d) | Average wind speed | 31.62 m/s |

2.3 Seismicity

For the purpose of designing electromechanical equipment, the following seismic conditions shall be taken into account, under which the equipment shall not be severely or permanently damaged:

- | | | |
|---|--|----------|
| - | Acceleration in any horizontal direction | > 0.25 g |
| - | Acceleration in vertical direction | > 0.12 g |

2.4 Transport

Equipment can be transported to the Site, i.e. to the storage area as follows:

- By the road transport, from Belgrade to Šabac and then along the Drina arterial road via Šabac - Ljubovija - Bajina Bašta – Perućac,
- By the road transport, from Belgrade to Bajina Basta via Valjevo, and then to Perućac,
- By the railway line-up from Belgrade to Loznica and then along the Drina arterial road via Šabac - Ljubovija - Bajina Bašta – Perućac
- By the railway line-up from Belgrade to Uzice and then along the road via Uzice - Bajina Bašta - Perućac

2.4.1 Intermodal (Maritime-Overland) Transport

If the equipment is transported by ship, it has to be reloaded onto road vehicles or railway wagons. Hoists can be used for that purpose and the Supplier is obliged to collect data about their capacities and operation conditions.

2.4.2 Air Transport

The nearest airport is Belgrade airport and it can be used for transport of people and equipment.

2.4.3 Transshipment

The Supplier shall provide the required cranes for transshipment of cargo at the railway station in Užice, as well as for unloading of cargo in the storage area, i.e. at the Site.

2.5 Storage and Working Areas

Storages (open-air and closed storage areas) for temporary storage of equipment shall be arranged at the Site.

Materials shall be deposited at the Site in the manner allowing the required access and maintenance of such materials in order to facilitate inspection and checking of the condition of the materials and equipment in storage areas.

2.6 Cranes at the Site

The existing cranes and hoists in PSP “Bajina Bašta” include the following:

- Large portal crane with the capacity of 2x250t+63t, located above the PSP powerhouse and overhead travelling crane with the capacity of 50t, located in the PSP powerhouse
- Large mobile, “Liebher” truck crane with the capacity of 70t and a telescopic boom

2.7 Accommodation, Meals and Transportation of the Supplier’s Personnel

Supplier’s personnel can be accommodated in the “Jezero” Hotel, which is situated next to the Hydroelectric Power Plant “Bajina Bašta”, or in the “Drina” Hotel, which is located in the town of Bajina Bašta, 12 km from HPP “Bajina Bašta”.

Hotel accommodation and meals costs for the Supplier’s personnel on Site, shall be borne by the Supplier.

The transportation from Belgrade airport to Bajina Basta Pumped Storage Power Plant and vice versa, and daily transportation from accommodation (hotel) to working site shall be arranged and provided by the Employer free of charge.

2.8 The Supplier’s Office

Office space with air conditioned and furnished including office telecommunication facilities such as telephone, network LAN (sufficient speed to be required), copy, printer and its related cost thereof, shall be provided by the Employer for use by the Supplier’s personnel assigned to site.

After completion of the works, the Supplier shall remove the accessories and material and restore the initial condition of the site before it was handed over to the Supplier.

2.9 Medical Care and Services

The Supplier shall provide and maintain a first aid kit for his own needs at Site.

Medical care, as well as surgical interventions for all the personnel at Site, shall be provided in the medical centre in Bajina Bašta and in General Hospital in Užice, with the organizational assistance of the Employer but at the Supplier's expense.

If he deems it necessary, the Supplier may organize special medical care for himself.

3 GENERAL REQUIREMENTS

3.1 Units of Measurement

All units of measurement shall be in the SI - system (Systeme International d'Unites).

Any deviation from this rule can be approved by the Employer only after the Supplier presents an adequately supported request.

3.2 Standards

Materials, fabrication and testing of the Delivery under the Contract shall be in accordance with Serbian Standards and official regulations, as well as with other approved Standards, if not contrary to the previous ones.

The latest editions of the following Standards and regulations shall be used, if applicable:

SRPS - (Serbian Standards)

ISO - (International Standardization Organization)

IEC - (International Electrotechnical Commission)

VDE - (Association of German Electrical Engineers)

ASTM - (American Society for Testing and Materials)

DIN - (German Industrial Norms)

EN - (European Norms)

ANSI - (American National Standard Institute)

The Supplier may also apply some other internationally recognized Standards and regulations valid in the country in which the equipment is manufactured, provided that it is of the same or higher quality than the quality required by the afore stated Standards and that the Employer's written approval has been previously requested and obtained. For that purpose, the Supplier shall, if so requested, submit to the Employer a copy of the standards and regulations that he intends to use. The Supplier shall also state clearly the scope of a deviation or deviations from the above stated Standards, as well as adequately explain and support any such deviation or deviations in order to enable the Employer to properly consider such a request made by the Supplier.

The Supplier is obliged to have the following certificates: ISO 9000, ISO 9001, ISO 14001, as well as CENELEC (paragraphs referring to the equipment that is the subject of Delivery).

3.3 Materials and Equipment Fabrication

Materials to be used in the manufacture of the equipment shall be of such a type, composition and physical properties which best suit their purpose and which are fully in

compliance with the best engineering practice. The entire equipment shall fully meet the applied Standards with respect to materials, fabrication, design and testing. Tolerances, adjustments and finishing shall be in accordance with the best up-to-date practice in the manufacture of products that are the subject of the Detailed Technical Specifications.

The entire equipment shall be of a reliable structure and designed for frequent start-ups.

The entire equipment shall operate without any excessive vibrations and it shall generate minimum noise.

If the Supplier intends to use materials not specifically produced for the Delivery and under the Contract, he shall provide and submit to the Employer an evidence confirming that such materials comply with the requirements specified in the General and Detailed Technical Specifications. In such a case, testing of materials may be omitted unless otherwise decided by the Employer.

Equipment, adjustment and fixing and other accessories shall be new, of an approved workmanship and standard, and of top quality.

In case of any deviation from the contracted drawings during the manufacturing process, a written report on the nature of such a deviation shall be submitted to the Employer by the Supplier, and the Employer shall decide whether the modified part of the equipment is acceptable or not.

The Employer's acceptance of any such deviation shall not relieve the Supplier from his obligation to deliver the equipment in full compliance with the Contract conditions.

Materials and equipment which are produced, used or installed without the Employer's approval can be subsequently rejected.

3.4 Packing and Shipment

3.4.1 Packing

All materials and the entire equipment shall be carefully packed to withstand any and all transportation conditions without any damage on the way from the Supplier's works to the installation site.

Whenever possible, the equipment shall be packed in strong boxes or strong packing material. The equipment packed in boxes and/or other packing material shall be firmly and safely fastened, so that it cannot move during transportation.

In order to avoid deformations of unpacked equipment, such equipment shall be fastened wherever necessary, and machined surfaces shall be protected adequately.

The equipment shall be fully protected from any and all damages from handling during its transport. For handling, hooks and/or belts shall be provided at suitable places in order to avoid any damage to the equipment. These places shall be clearly and accurately indicated in the drawings and instructions. Special protection shall be adequately provided in view of climatic conditions.

The parts of equipment sensitive to harmful effects of dust or moisture shall be adequately protected by means of suitable packing material which prevents penetration of air, as well as by means of moisture absorbents.

Fragile and sensitive equipment and parts shall be adequately packed in shock-resistant boxes clearly marked with appropriate warnings.

The Supplier shall be responsible for any and all damages of the equipment during its transport, as well as for any and all damages due to insufficient or improper packing, careless handling, loading or unloading, as well as due to insufficient protection against overturn during transportation. Any such damage or deficiency shall be remedied by the Supplier at his own expense.

All packing material shall be the Employer's property.

3.4.2 Shipment of Materials and Equipment

The Supplier shall be responsible for:

- Packing, loading, transportation, either by his own means of transport or in any other way, from the place of manufacture to the port or loading station
- Unloading, transportation and transshipment during road, railway or intermodal road and railway transport to Site, as well as at Site,
- Insurance of cargo during the transport, including provision and forwarding of all shipping documents, as well as for payment of all shipping and transshipment documents and costs

The Supplier shall check and make sure that transshipment equipment is adequate for carrying the heaviest parts.

3.5 Technical Documents, Data and Information

3.5.1 General

a) Purpose

The main purpose of the General and Detailed Technical Specifications is to ensure that the supplied equipment is manufactured and installed completely and in all details in accordance with its designed purpose. Therefore, the Supplier undertakes, by signing this Contract, to properly manufacture and put it into operation the complete equipment, regardless of any omissions in the wording and/or drawings of the General and Detailed Technical Specifications.

b) Drawings

All equipment presented in the drawings which is not mentioned or described in the General or Detailed Technical Specifications shall be deemed included in the Contract as if it had been described in the General or Detailed Technical Specifications.

3.5.2 Documents and Information to Be Submitted to the Employer

a) General

For the equipment to be supplied under the Contract, the Supplier shall submit the following to the Employer for approval: drawings, design data, calculations, samples, catalogues, illustrations, printed brochures, method statements, test programmes, installation and testing instructions, operation and maintenance instructions, training programmes, certificates, test protocols, reports and other documents which might be required, or which can be reasonably requested by the Employer, or which are stipulated in the Detailed Technical Specifications.

The sequence of presentation of various pieces of information shall be such so as to ensure that the relevant information is available when a document is received for examination. The above-stated documents officially submitted by the Supplier shall include the Supplier's official confirmation that all the data contained therein have been checked by the Supplier and correct for use.

Preliminary documents, which are submitted only for information, shall be clearly identified.

The Supplier shall not make any modifications of the equipment supplied under the Contract in relation to the technical documents which are an integral part of the Contract.

If, however, a modification proves to be necessary, the Supplier shall previously obtain a written approval of the Employer.

The Supplier shall include in the technical documents any and all modifications made by him within the Delivery.

The Supplier shall submit to the Employer all draft design and other technical documents in 2 copies and the final version of such documents in 6 copies. The copies shall be bound with high-quality hard covers or with high-quality plasticized folders with hard covers. Each copy shall bear clear title, version (Draft-Final), review, date of issuance and verification.

The Employer's approval of the documents shall have no effect on the price contracted for the Delivery.

b) Programme of Works

Programme of Works shall be included in the Tenderer's Tender, showing the sequence of works proposed by the Tenderer for the Delivery, including designing, procurement of materials, manufacture, transport, Delivery to the Site, supervision of installation, testing, putting into operation and Taking-over.

The Programme of Works shall be prepared in accordance with Preliminary Time Schedule of the Tender Procedure and procurement of equipment that is the subject of the Delivery.

Upon submission and approval of the Detailed Time Schedule of Work Execution for the implementation of the Contract, the Supplier shall observe the sequence of procedures and methods stated therein, unless he obtains a written approval from the Employer, allowing him to alter such a procedure or method. Such an alteration shall in no way affect the contracted price and Taking-over deadline.

c) Testing Programme

Together with his Tender, the Tenderer shall submit to the Employer his Programme of Equipment Testing in the Workshop and at Site, in accordance with the requirements stipulated in the Detailed Technical Specifications.

After signing of the Contract, the Supplier shall submit to the Employer for approval a Detailed Programme Equipment Testing in the Workshop and at Site, which shall have no effect on the contracted price.

d) Drawings of Overall Dimensions

The Supplier shall submit to the Employer for approval the drawings of overall dimensions of the equipment to be supplied under the Contract, including the estimated weights, forces, anchoring details and allowable total dimensions in order to facilitate preparation of the premises in which the equipment will be installed.

e) Electrical Diagrams

The Supplier shall submit to the Employer for approval complete circuit diagrams, as well as schematic diagrams of control, governing, measurements, protection, signalling, synchronisation etc. for the entire equipment supplied under the Contract.

Cables between parts or apparatuses shall be adequately designated with numbers and marked. Individual drawings and diagrams shall contain reference numbers of all outgoing cables, and other pertinent drawings shall show all data necessary for interconnections and wiring.

Circuit diagrams shall be extended, with separately marked contacts and columns designated with numbers. Relays and control circuit breakers shall be presented in the same diagram together with their coils and all pertinent contacts, with the reference to the column in which the contacts are used.

The circuit diagrams shall also contain the designation of the reference numbers of terminals to which the apparatuses are connected, taken from the wiring diagrams.

The circuit diagrams for measurements shall include all measuring devices and transformers, measuring transducers, indicating instruments and all other equipment using measuring signals.

f) Technical Solution

Before commencing production of the equipment to be supplied under the Contract, the Supplier shall submit for approval his technical solution which shall, among others, include all necessary technical descriptions, calculations, technical data, drawings, etc, in order to demonstrate that the entire equipment fully complies with the regulations and the intended use as stated in the Contract, as well as with installation, operation and maintenance requirements.

Fabrication of the equipment may commence only after the technical solution is approved by the Employer.

g) Operation and Maintenance Instructions

The Supplier shall submit to the Employer for approval complete and detailed Operation and Maintenance Instructions for the equipment and all special tools that are an integral part of the Contract. These instructions shall be as clear as possible and they shall comprise complete relevant documents and diagrams.

h) Training Programme

Training programme for operation and maintenance of the equipment to be supplied by the Supplier shall be prepared by the Supplier and submitted to Employer for approval.

The Supplier shall also prepare and submit for approval the Programme of Training at the Site for operation and maintenance of the equipment for individual wholes of the plant, even if such a whole includes equipment not to be supplied by the Supplier but to be received from the Employer (necessary documents for such equipment shall be provided by the Employer).

3.5.3 Examination of Drawings and Other Documents

Each document - Final version to be submitted to the Engineer for examination shall be submitted in six copies, on a strong paper with dark lines on a white background. Drafts shall be submitted in two copies.

All drawings and sheets with calculations shall be folded to a size corresponding to German DIN 476, series A, and preferably they should be folded to A4 size of the same series (297 x 210 mm).

Two copies shall be returned to the Supplier with the remark "approved", "approved with indicated corrections" or "not approved". Copies bearing the remark "approved" and "approved with indicated corrections" authorize the Supplier to proceed with the construction and manufacture of the equipment according to those drawings with corrections, if any, as indicated on the drawings. This examination, however, does not relieve the Supplier from his obligation to delivery the equipment fully in accordance with the Contract and the intended use of the equipment.

No corrections shall be made after a drawing is returned to the Supplier with the remark "approved".

If copies of drawings bear the remark not approved" or "approved with indicated corrections", the Supplier shall make necessary corrections and indicate them clearly in the drawings. He shall then submit again six copies of revised drawings for the final version and two copies for the draft documents.

The Supplier shall be responsible for the corrections which are not clearly marked. Each review shall be included in a review book, including the review number, date and subject. In addition, each reviewed drawing shall have clearly entered number, date and subject of all previous reviews.

The Supplier shall leave a blank space of 100 mm x 70 mm in all drawings in the block with the titles of drawings for insertion of the Engineer's comments during examination.

If any error is discovered in the Supplier's drawings during equipment installation, corrections including all necessary modifications shall be indicated in the corresponding drawing and it shall be re-submitted for examination and approval as afore stated, without any costs for the Employer.

The Supplier shall be responsible for all non-compliances, errors or omissions in his drawings, regardless of whether such drawings and details have been approved by the Engineer or not.

The Supplier shall keep one out of two returned copies with the remark "approved" at the Site.

All the above stated requirements applicable to drawings shall equally be applicable to design data, calculations, catalogues, illustrations, printed brochures, technical

descriptions, schedules of technical data, method statements, test programmes, installation instructions, operation and maintenance instructions, training programmes, certificates, test protocols and reports, as well as to all other similar documents and data submitted for examination.

The Supplier shall make any and all necessary amendments in the documents so that the Delivery is implemented in accordance with Contract provisions and with the intended use of Delivery, without any costs for the Employer.

3.5.4 Time Limit for Examination of Documents

All documents submitted by the Supplier to the Engineer for examination shall be returned to the Supplier with the Engineer's seal confirming review of the document or with his comment within fifteen (15) days from the receipt of the documents in the Employer's office.

If the Engineer deems it necessary to extend the time limit for examination of some documents, he shall inform the Supplier thereabout in writing within ten (10) days from the receipt of such documents.

3.5.5 Language

All the documents submitted by the Supplier to the Employer for examination shall be in Serbian or English language.

3.6 Licenses and Permits

The Supplier shall provide any and all permits, licenses and authorisations required for the Delivery under this Contract. The Supplier shall also protect the Employer from any overstepping of obligation, license, or authorisation already provided or to be provided for the Delivery, as well as from any and all violations of applicable rules and provisions, made in full or in partial, by the Supplier or his Sub-Suppliers.

3.7 Hidden Deficiencies

The Supplier shall be notified by the Employer of any hidden deficiency within thirty (30) days from the date it is discovered. Any such deficiency shall be remedied by the Supplier immediately after it is discovered in the same way as if it occurred within the defects liability period.

3.8 Procedures to be Followed in the Supplier-Employer Relations

3.8.1 Supplier's Organization

The Supplier shall appoint his Project Manager and make an organization chart, presenting his key personnel assigned to the implementation of the project, including their positions. As a rule, those shall be the persons indicated in the documents submitted with the Supplier's Tender.

The Employer shall be advised in writing and beforehand of any changes in key positions of the personnel assigned to the implementation of the project. Any such action of the Supplier shall be subject to the Employer's approval.

3.8.2 Communication

Technical coordination shall develop through the Employer's Project Manager and the Supplier's Project Manager. The Supplier will not directly communicate with the Employer's

personnel or the Employer's consultant without previous explicit approval of the Employer's Project Manager.

3.9 Interchangeability and Standardisation

Homologous parts shall be interchangeable without a need for adjustment.

Parts and elements from large-scale production shall be standardised, such as: flanges, bolts and screws, nuts and threads, valves, measuring and detecting devices, electrical instruments and measuring tools, terminals and connections, primary, secondary and auxiliary relays, contactors, fuses and circuit breakers, lamps, plugs and plug outlets, pushbuttons, lubricants, etc.

3.10 Marking of Equipment

The entire equipment shall be complete with permanent name plates fixed to it on a visible place. Name plates shall be made of material resistant to atmospheric impacts. Name plates shall bear imprinted or engraved manufacturer's name and trademark, as well as the type, serial number and designation of the item of equipment, including details of operation characteristics.

Name plates and markings shall be made of non-hygroscopic material, with engraved or imprinted characters in contrast colours, or of transparent plastic material with adequately coloured characters engraved on the back side of the equipment.

Name plates and markings used for marking of component parts of a device shall be fixed to the part or to the door of the cubicle or in its immediate vicinity in order to enable quick replacement, disassembling and re-assembling.

All name plates shall be in Serbian language.

3.11 Tools

There shall be two kinds of tools:

- Installation tools, and
- Special tools

Special tools shall be supplied by the Supplier, if necessary, for installation, overhaul and maintenance of entire equipment to be supplied under the Contract.

All special tools shall be marked for identification of their use and shall be available for installation. Therefore, special tools shall be delivered with the first shipment of materials supplied under the Contract.

4 TESTS

4.1 General

The Supplier shall perform workshop tests and site tests in order to verify that the equipment and installation works under the Contract comply with the requirements of the General and Detailed Technical Specifications and valid Standards.

The Supplier shall provide for the Engineer any and all means necessary for supervision and monitoring of tests. The tests shall be carried out by the Supplier at his own

expense. The Supplier shall make a test report, including his comments on test results, and submit it to the Employer.

The materials used for equipment manufacture shall be subject to tests and test certificates shall be issued at the place where materials are manufactured, at the Supplier's factory or at Sub-Supplier's factory. All costs of testing shall be borne by the Supplier and test certificates shall be submitted to the Employer for approval.

In general, the Supplier shall provide test certificates for the entire equipment to be supplied in accordance with the Detailed Technical Specifications. The Supplier may be relieved from his obligation to submit test certificates for any part of the equipment only if so approved by the Employer.

The Supplier shall specify the scope of tests to be performed in the workshop and at the site and submit it together with his Tender, as stipulated in the Detailed Technical Specifications.

After signing of the Contract, the Supplier shall prepare a detailed Programme of Tests and submit it to the Employer for approval. The Engineer's presence during the tests shall not be construed as a relief of the Supplier from his obligation to fully observe the requirements stipulated in the Detailed Technical Specifications.

The Supplier shall prepare and submit to the Employer for approval a report on each completed test within five (5) days after completion of the test.

If test results show that the equipment or parts of the equipment do not fulfil the requirements stipulated in the Detailed Technical Specifications, the equipment or its parts shall be modified, supplemented or replaced and, if necessary, additional tests shall be carried out in order to demonstrate that the requirements from the Detailed Technical Specifications have been fully met. All the material, equipment, measuring, recording and other instruments required for tests shall be provided by the Supplier.

4.2 Workshop Tests

Workshop tests shall include tests during equipment manufacturing, as well as factory acceptance tests.

Workshop tests during equipment manufacturing shall include testing of materials, as well as type and individual tests for each type of equipment to be installed.

For factory acceptance tests, the entire equipment shall be completely assembled as much as possible.

Acceptance tests shall be performed in order to demonstrate that the equipment complies with the General and Detailed Technical Specifications. If possible, the equipment that will be finally installed shall be used for these tests.

Any detachable part shall be adequately marked in order to ensure its proper re-installation at the Site.

Workshop tests shall be carried out in the presence of the Engineer if not otherwise agreed. However, some tests may be performed without the Engineer's presence but with his previous approval. FAT is described in detail in the Detailed Technical Specifications.

4.3 Site Tests

Upon arrival of the equipment at the Site and during the works stipulated in the Detailed Technical Specifications, all parts of the equipment shall be subject to control and testing.

Site tests shall be carried out in accordance with the approved Detailed Programme of Tests and they shall include tests during and after completion of installation (Pre-commissioning tests), Commissioning Tests and tests performed during Trial Run.

Tests during the Trial Run shall be carried out in order to verify that the guaranteed and technical characteristics of the equipment are in accordance with the values specified in the Detailed Technical Specifications.

4.4 Trial Run

After the tests from the previous stage are successfully completed, Trial run shall be commenced with. Trial run shall include testing and monitoring of continuous operation of the supplied equipment during the period of 180 days.

During the Trial run, some of the tests carried out during the previous test procedure can be also performed under the conditions which shall not jeopardize safe and reliable operation of the equipment and entire Power Plant. Such tests shall be agreed upon with the Employer in advance.

Shut down of the Power Plant longer than 48 hours for any reason shall extend the Trial run for the same period of time, cumulatively.

5 TABLE OF DEVIATIONS

In accordance with Clause 7.4 b), Volume 0: Invitation and Instructions to Tenderers, all deviations from the data and requirements stated in these General Technical Specifications shall be entered by the Tenderer in the Table of Deviations, indicating the particular data and conditions included in his Tender that those deviations refer to.

It shall be deemed that all other data and conditions referring to the Delivery in accordance with these General Technical Specifications, which are not included in the Table of Deviations, have been accepted by the Tenderer.

The form of the Table of Deviations is given in Volume 1: Contract Conditions and Forms, Part III: Forms.

VOLUME 3: DETAILED TECHNICAL SPECIFICATIONS

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1 DESCRIPTION AND INSTRUCTIONS

1.1. General

These Detailed Technical Specifications together with the General Technical Specifications refer to the special technical requirements for the preparation of the technical documents, manufacture, workshop tests, Delivery to the site, supervision of installation, tests during and after installation, Commissioning Tests, trial run and preliminary Taking-over of the Governor, JC and AFC equipment for the PSP "Bajina Bašta".

All the equipment specified herein shall comply with the requirements and characteristics given hereinafter.

1.2. Warranties and Rejection of Delivery

1.2.1 Warranties

Everything that has been said regarding the warranties in Volume 1: Contract Conditions and Forms, is applicable. The Supplier shall guarantee that above mentioned equipment fully meet the performances specified in Schedules of Technical Data.

1.2.2 Rejection of Delivery

In case the delivered equipment does not meet the requirements which are described within these Detailed Technical Specifications and stated in the Schedules of Technical Data, the Employer has the right to reject the Delivery.

1.3. Instructions to Tenderer

Integral parts of these Detailed Technical Specifications for the equipment Delivery are:

- Contract Conditions and Forms
- General Technical Specifications

and all the conditions prescribed under these Detailed Technical Specifications are compulsory for the Tenderer.

The Tenderer is obliged to submit in his Tender all the technical data, in compliance with the requirements from these Detailed Technical Specifications.

The Tenderer is obliged to offer the following services:

- Appropriate supervision of the equipment installation and putting into operation
- Training of the Employer's personnel

The Tenderer can offer modified or variant technical solution, but this modification, i.e. variant solution must not violate the basic functional purpose or reduce the capacity of the offered equipment. The modification, i.e. variant solution must fully fit into the comprehensiveness of these Technical Specifications.

The Tenderer is obliged to submit with his Tender the List of his Sub-Suppliers, with a note which parts, i.e. which equipment is in question and he is obliged to state their References related to fabrication of the relevant parts, i.e. equipment.

2 SCOPE OF WORKS

Within the stated scope of Delivery and works and within the contracted price, the Tenderer, i.e. the Supplier is obliged to include into the Tender and Delivery, the equipment and the devices which have not been explicitly stated in these Specifications, but which are necessary for proper functioning of the equipment. This completeness clause also refers to the devices which show to be functionally necessary.

This section specifies the general technical requirements for the replacement of Unit No. 1 and Unit No. 2 of Bajina Basta Pumped Storage Hydroelectric Power Plant, which includes the design, fabrication of new components and parts, technical advisory services and guarantee of repair, technical advisory services and guarantee of adjustment and disassembly, general inspection, tests and startup of the Pump-Turbine, including the speed governor (GOV), automatic frequency control (AFC), power joint control (JC), the wiring and other accessories, according to these Contract Documents, except where these are modified in the subsequent sections. These requirements should be fulfilled in full, inasmuch as the previous equipment and systems contain materials, components or similar parts to those described in this section.

The equipment of this section, even in the parts described in the singular for the equipment, should similarly be applied to all the equipment to be intervened with under the scope of these Specifications.

The primary objective of the work is to carry out the technical advisory services and guarantee of assembly and tests of the equipment supplied, as well as the technical advisory services and guarantee of the reconditioning, repairs, modifications and necessary conditioning of the equipment and systems which form the objective of this Contract, to the satisfaction of DLHE and for this purpose, the Supplier shall be responsible for the design, details, presentation of drawings, calculations, instructions and data, fabrication, factory tests, preliminary tests and supervision, and guarantee of demolition, disassembly, repair, assembly, installation and verification. The Supplier shall also be in charge of the equipment tests planned for Bajina Basta Pumped Storage Hydroelectric Power Plant, technical advisory services of starting and of the on-site tests, of the energizing and of the preparations for putting into service and commercial operation of the equipment for the replacement of the GOV, AFC and JC of Unit No. 1 and Unit No. 2 of the Bajina Basta Pumped Storage Hydroelectric Power Plant and other elements which constitute the objective of these Technical Specifications, including the supply of accessories, spare parts, tools and test and maintenance equipment.

The scope of Delivery and works should comprise the following:

- Equipment of the Governor, JC and AFC in compliance with the Clause 4.1 of these Technical Specifications,
- Notification to the Employer, in compliance with the Clause 4. of the General Technical Specifications
- Packing, shipping, transport and insurance of the transport, in compliance with the Clauses 12, 13 and 14 of the Contract Conditions and the Clauses 2.4 and 3.4 of the General Technical Specifications
- Supervision of installation of the equipment in compliance with the Clause 4.10 of the General Technical Specifications

- Type and routine tests, in compliance with the Clause 5.2 of these Technical Specifications
- Site tests, in compliance with the Clause 5.3 of these Technical Specifications
- Trial run, in compliance with the Clause 5.4 of the General Technical Specifications
- Training of Employer's Personnel, in compliance with the Clause 18 of the Contract Conditions
- Special Tools, in compliance with the Clause 4.1.1.3. of these Technical specifications, and the Clause 3.11 of the General Technical Specifications
- Warranties in compliance with the Contract Conditions and the General Technical Specifications

3 DESIGN, MATERIAL AND FABRICATION

The Design, material and fabrication have to be in compliance with the General Technical Specifications, particularly with the Clause 4 of these Detailed Technical Specifications.

3.1. General

All the equipment has to be state-of-the-art from the technological aspect and it has to be envisaged for long-time of operation. The equipment has to meet the latest technical achievements, in the field of manufacturing, as well as in designing.

All the equipment that has been specified in this Section shall be designed in such a manner to satisfy in full the climatic and operational conditions specified in the General Technical Specifications.

The make has to enable easy and fast maintenance of all its component parts.

3.2. Safety Measures

All live parts of the electric equipment (voltages over 65 V) shall be protected against a direct contact, either by means of their functional insulation or by means of their constructional solution, position, adjustment or other special devices in order to achieve necessary degree of protection.

Any accidental direct contact with the live parts inside the cubicle shall be prevented by means of partitions, which must be earthed in a proper way, and by separating each portion of the cubicle.

3.3. Materials and Equipment

All the materials, parts and equipment to be used for the execution of the work should be of the Supplier's best quality, free from defects and imperfections, of recent manufacture, new and appropriate for the use for which intended and, where specified, should be of the designated grade and classification, or be an approved equivalent. Special care should be taken in the supply of high-reliability, long-lasting materials and equipment, with broad safety factors and appropriate operating characteristics. All the materials, parts and equipment should be products from recognized manufacturers. The Supplier should supply DLHE, for its approval, with the names of the manufacturers together with complete information related to their products, which it is proposed to incorporate into the work. Materials not indicated in these specifications may be used, provided their use and maximum design stress,

established and documented by the Supplier, are approved by DLHE. The specifications of the materials, including grading and classification, should be indicated in the detailed drawings that the Supplier presents for review. When equivalent specifications of materials and/or equipment are to be used, the complete details and specifications should be submitted to DLHE for approval, including bill of materials and/or equipment, equivalents with the standards specified and the identification of the components of the equipment for which they will be used. When instructed, samples of materials should be submitted to DLHE for approval.

The offer should present the detailed Technical Specifications of the self-lubricating materials proposed to be used in each unit, including the mechanical properties, estimated useful life based on tests and experience in the prototypes, as well as the corresponding historic data, showing no less than ten (10) years of satisfactory service.

3.4. Standards

Unless specified otherwise, the materials and equipment to be used should have equivalent or better properties and characteristics from those required in the most recent editions of the standards and publications specified in the following:

| | Materials | Specifications |
|---|---------------------|--|
| 1 | Aluminum conductors | ASTM B317, "Specification for Aluminum – Alloy Extruded Bar, Rod, Pipe, and Structural Shapes for Electrical Purposes (Bus Conductors)", Alloy 6101 of high conductivity. ASTM B236, "Specification for Aluminum Bars for Electrical Purposes (Bus Bars)". |
| 2 | Copper conductors | ASTM B48, "Specification for Soft Rectangular and Square Bars Copper Wire for Electrical Conductors", Type B. ASTM B187, "Specification for Copper Bar, Bus Bar, Rod and Shapes". ASTM B188, "Specification for Seamless Copper Bus Pipe and Tube". |
| 3 | Aluminum coverings | ASTM B241/B241M, "Specification for Aluminum and Aluminum - Alloy Seamless Pipe and Seamless Extruded Tube", Alloy with a high mechanical strength and high conductivity, 6063-T6. Aluminum for electric use 1350 (EC; UNS 91350) with a high purity (99.5%) and high conductivity. |
| 4 | Structural aluminum | ASTM B308, "Specification for Aluminum - Alloy 6061-T6 Standard Structural Profiles". |

| | Materials | Specifications |
|----|------------------------------------|--|
| 5 | Carbon steel castings | ASTM A27/A27M, "Specification for Steel Castings, Carbon, for General Application". Grade 70 - 36, and Grade 70 - 40. |
| 6 | Low alloy steel castings | ASTM A148/A148M, "Specification for Steel Castings, High - Strength, for Structural Purposes", Grade 80 - 50. |
| 7 | Corrosion resistant steel castings | ASTM 743/A743M, "Specification for Castings, Iron - Chromium - Nickel, Nickel Base Corrosion - Resistant, for General Application", Grade CA-15, Grade CF- 8 and Grade CA- 6NM. ASTM A744/A744M, "Specification for Castings, Iron - Chromium - Nickel, and Nickel Base, Corrosion - Resistant, for Severe Service". Grade CF- 8. |
| 8 | Corrosion resistant steel plates | ASTM A167, "Specification for Stainless and Heat - Resisting Chromium - Nickel steel Plate, Sheet, and Strip". ASTM A176, "Specification for Stainless and Heat - Resisting Chromium, Steel Plate, Sheet, and Strip". ASTM A240/A240M, "Specification for Heat - Resisting Chromium and Chromium - Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels". Types 304, 309, 316, 405 and 410. |
| 9 | Carbon steel bars | ASTM A108, "Specification for Steel, Bars, Carbon, Cold - Finished, Standard Quality", Grade 1050. |
| 10 | Steel alloy bars | ASTM A331, "Specification for Steel Bars, Alloy, Cold - Finished", Grade 4140. |
| 11 | Corrosion resistant steel bars | ASTM A582/A582M, "Specification for Free - Machining Stainless Steel Bars", Type 303 and Type 416. ASTM A276, "Specification for Stainless and Heat Resisting Steel Bars and Shapes", Types Series 300 and 400. |
| 12 | Structural steel and for supports | ASTM A36/A36M, "Specification for Carbon Structural Steel". |
| 13 | Electrical steel | ASTM A345, "Specification for Flat - Rolled Electrical Steels for Magnetic Applications". |

| | Materials | Specifications |
|----|--|--|
| 14 | Steel for cores | ASTM A876, "Specifications for Flat - Rolled, Grain - Oriented, Silicon Iron Electrical Steel, Fully Processed". |
| 15 | Nickel-copper alloy plate | ASTM B127, "Specification for Nickel – Copper Alloy (UNS No. 4400) Plate, Sheet, and Strip". |
| 16 | Iron castings | ASTM A48/A48M, "Specification for Gray Iron Castings", Class 30. |
| 17 | Cast-iron flanges and accessories | ANSI A 126, ASME B 16.1. |
| 18 | Carbon steel and steel alloy forgings | ASTM A668/A668M, "Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use", Classes D and E for carbon steel and Classes D and H, or higher, for steel alloy. |
| 19 | Carbon steel forgings (for flanges, accessories, etc.) | ASTM A181/A181M, "Specification for Forgings, Carbon Steel, for General – Purpose Piping", Class 60 and Class 70 |
| 20 | Hardened corrosion resistant steel forgings | SEW 400, 1.4313 V3 (X4CrNi13.3) or X5CrNi13.4; or ASTM A705 "Specification for Age - Hardening Stainless and Heat Resisting Steel Forging", type 630, or ASTM A565, "Specification for Martensitic Stainless Steel Bars, Forging and Forging Stock High Temperature Service"; or ASTM A473, "Specification for Stainless and Heat Resisting Steel Forging", type series 400. |
| 21 | Carbon steel and structural steel plates (for parts subject to low stress) | ASTM A283/A283M, "Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars". (Plates 50 mm thick or less), Grade A and Grade B. ASTM A36/A36M, "Specification for Structural Steel". |
| 22 | Carbon steel plates (for parts which support significant stress) | ASTM A285/A285M, "Specification for Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength". (Plates 50 mm thick or less), Grades B and C. |
| 23 | Intermediate resistance steel plates (for parts subject to significant stress where on-site welded joints are required). $t \leq 200$ mm | ASTM A516/A516M, "Specification for Pressure Vessel Plates, Carbon Steel, for Moderate and Lower-Temperature Service", Grade 60 or better, except that all plates thicker than 25 mm (1") should be normalized in order to obtain grain refinement. |

| | Materials | Specifications |
|----|---|---|
| 24 | High-resistance steel plates (for parts subject to high stress which do not require on-site welded joints). $t \leq 150$ mm | ASTM A517/A517M, "Specification for Pressure Vessel Plates, Alloy Steel, High - Strength, Quenched and Tempered". |
| 25 | Suspension and support elements | The hangers and supports should be standard products to be used in combination with structural steel supports, fabricated at the site. |
| 26 | Bronze castings | ASTM B584, "Specification for Copper Alloy Sand Castings for General Applications", Copper alloy UNS Nos. C90300 and C92300. |
| 27 | Bronze (for bolts, stored bolts and bronze nuts) | ASTM B21, "Specification for Naval Brass Rod, Bar, and Shapes" Copper alloy UNS No. C46400. |
| 28 | Bronze (for bearings, base plates, etc.) | ASTM B584, "Specification for Copper Alloy Sand Castings for General Applications", Alloys UNS Nos. C93200 and C93700. |
| 29 | Bronze pipes | ASTM B43, "Specification for Seamless Red Brass Pipe, Standard Sizes", Copper alloy UNS No. C23000. |
| 30 | Copper pipes | ASTM B42, "Specification for Seamless Copper Pipe, Standard Sizes". ASTM B88/B88M, "Specification for Seamless Copper Water Tube", Type K. |
| 31 | Bronze flanges and accessories | ANSI B16.26, ANSI B16.18, ANSI B16.22. |
| 32 | Aluminum pipe | ASTM B241/B241M, "Specification for Aluminum and Aluminum - Alloy Seamless Pipe and Seamless Extruded Tube". |
| 33 | Stainless steel pipe | ASTM A312/A312M, "Specification for Seamless and Welded Austenitic Stainless Steel Pipe". ANSI B36.19, "Stainless Steel Pipe", seamless, Grade TP316N. |
| 34 | Titanium tubes | ASTM B338, "Specification for Seamless and Welded Titanium and Titanium - Alloy Tubes for Condensers and Heat Exchangers". Grade 2. |

| | Materials | Specifications |
|----|---|---|
| 35 | Steel pipe | <p>ASTM A53, "Specification for Pipe, Steel, Black and Hot Dipped, Zinc - Coated Welded and Seamless", Grade B, seamless.</p> <p>ASTM A106, "Specification for Seamless Carbon Steel Pipe for High – Temperature Service".</p> <p>ASTM A120, "Specification for Pipe, Steel, Black and Hot - Dipped Zinc - Coated (Galvanized) Welded and Seamless, for Ordinary Uses".</p> |
| 36 | Steel pipe flanges and flanged fittings | <p>ANSI B16.5 "Steel Pipe Flanges and Flanged Fittings".</p> <p>ANSI/ASME B16.9, "Factory - Made Wrought Steel Buttwelding Fittings".</p> <p>ASTM 105, ASME B16.5. Finish 125-250. AARH.</p> <p>ASTM A234, ASME 16.9</p> |
| 37 | Rigid steel conduit | ANSI C80.1, "Specification for Rigid Steel Conduit, Zinc Coated", hot-dip galvanized. |
| 38 | Nonmagnetic rigid steel conduit | ANSI C80.5, "Specification for Rigid Aluminum Conduit". |
| 39 | Fittings for steel conduit | <p>ANSI / UL 5148, "Fittings for Conduit and Outlet Boxes".</p> <p>ANSI C80.4 "Fittings for Rigid Metal Conduit and Electrical Metallic Tubing".</p> <p>US Fed. Spec. WW-C-581d, "Conduit, Metal Rigid; and Coupling, Elbow, and Nipple, Electrical Conduit: Zinc Coated".</p> <p>NEMA Publication No. FB-1, "Standard for Conduit Fitting, Cable Fitting and Accessories".</p> |
| 40 | Flexible steel conduit | UL No. 1, "Flexible Steel Conduit". |
| 41 | Steel wire cables | U.S. Fed. Spec. RR-W-410 C, "Wire Rope and Strand", IWRC, Regular wound, Type 1, Class 2 and Class 3. |
| 42 | Brass pipe | ANSI/ASME B16.15, "Cast Bronze Threaded Fittings, Classes 125 and 250". |
| 43 | Expansion anchorings | Expansion anchoring Type HAD or HST, stainless steel. |

| | Materials | Specifications |
|----|--------------------------|---|
| 44 | Insulated wire and cable | <p>ANSI/NFPA 70, "National Electrical Code" (NEC), Types XHHW, RHW, THW and SIS.</p> <p>ICEA S-66-524/NEMA WC 7, "Cross Linked Thermosetting Polyethylene Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy".</p> <p>ICEA S-68-516/NEMA WC 8, "Ethylene - Propylene Rubber - Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy".</p> <p>ICEA S-61-402/NEMA WC 5, "Thermoplastic - Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy".</p> |
| 45 | Brazing filler metal | ANSI/AWS A 5.8, "Specification for Brazing Filler Metal". |
| 46 | Welding electrodes | AWS A 5.1, "Specification for Carbon Steel Covered Arc - Welding Electrodes". |
| 47 | Strong metal for brazing | ANSI/AWS A5.8 "Specification for Brazing Filler Metal". |
| 48 | SF6 gas | <p>ASTM D2472, "Specification for Sulfur Hexafluoride".</p> <p>IEC 60376, "Specification and Acceptance of New Sulphur Hexafluoride".</p> <p>IEC 60480, "Guide to the Checking of Sulphur Hexafluoride (SF6) Taken from Electrical Equipment".</p> |
| 49 | Zinc coatings | <p>ASTM A123/A123M, "Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron Steel Products".</p> <p>ASTM A153/A153M, "Specification for Zinc Coating (Hot - Dip) on Iron and Steel Hardware".</p> <p>ASTM A239, "Test Method for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles by the Preece Test (Copper Sulfate Dip)".</p> |
| 50 | Chromium plated | ASTM B177, "Standard Practice for Chromium Electroplating on Steel for Engineering on Steel for Engineering Use". |
| 51 | Wheels | ASTM A504, "Specification for Wrought Carbon Steel Wheels", Class CR, (rim treated). |
| 52 | Epoxy resin | Anti-retractive epoxy resin or similar. |

| | Materials | Specifications |
|----|--|--|
| 53 | Sealing washers | Cadmium plated, with neoprene sealing elements. |
| 54 | Zinc coating | ASTM A123/A123M, "Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron Steel Products". ASTM A153/A153M, "Specification for Zinc Coating (Hot - Dip) on Iron and Steel Hardware". ASTM A239, "Test Method for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles by the Preece Test (Copper Sulfate Dip)". |
| 55 | O-ring seals | Vulcanized synthetic rubber mixture, using neoprene or nitrile as the only polymer, resistant to heat, oil and the ozone. Do not use nitrile in case of exposure to sunlight. Hardness 55 ±5 in durometer shore "A". |
| 56 | Permanently self-lubricated, bushings, strips and washers with rated friction coefficient less than 0.15 | ASTM-B 22, "Specification for Bronze Casting for Bridges and Turntables", Alloy 863, with self-lubricating inserts; or a bimetallic compound fabricated by pressure-sintering the copper over stainless steel at a high temperature, impregnated with high-quality lubrication Teflon; or fabricated of synthetic fibers impregnated with high-quality lubrication Teflon, of the types approved by CORPOELEC. |
| 57 | Carbon steel studbolts, bolts and nuts | ASTM - A193, Gr. B7; ASTM 194 Gr. 2H; ASTM A307, "Specification for Carbon Steel Externally Threaded Standard Fasteners"; ASTM A325 "Specification for High - Strength Bolts for Structural Steel Joints" and ASTM A490 "Specification for Heat - Treated Steel Structural Bolts, 150 ksi (1035 MPas) Tensile Strength". |
| 58 | Corrosion resistant steel for general use for busbars, nuts, washers, etc. | ASTM A276, "Specification for Stainless and Heat Resisting Steel Bars and Shapes", Type Series 300 Austenitic, or ASTM A240/A240M, "Specification for Heat - Resisting Chromium and Chromium - Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels". Type Series 300 Austenitic. |
| 59 | Motors | NEMA MG 1, "Standards for Motors and Generators". |

| | Materials | Specifications |
|----|--|---|
| 60 | Selector switches, control relays, contactors, starters, pushbutton assemblies, pressure, level and temperature limit switches and other control devices | NEMA ICS 1 "General Standards for Industrial Control and Systems". NEMA ICS 2, "Standard for Industrial Control Devices, Controllers and Assemblies". |
| 61 | Control systems, including programmable controllers | NEMA ICS 3, "Industrial Systems"; IEC 61131 "Programmable Controllers"; IEC 61000-4-6 "Electromagnetic Compatibility (EMC) Part 4: Testing and Measurements Techniques - Section 6 - Immunity to Conducted Disturbances, Induced by Radio Frequency Fields". NEMA ICS 5 "Industrial Control and Systems Control - Circuit and Pilot Devices". |
| 62 | Control systems | ISA Standard RP55.1 "Hardware Testing of Digital Process Computers". ISA Standard RP60.6 "Nameplates, Labels and Tags for Control Centers". ISA Standard RP5.1 "Instrument Symbols for Process Displays". ISA Standard S5.3 "Graphic Symbols for Distributed Control-Shared Display Instrumentation, Logic and Computer Systems". ISA S5.5 "Graphic Symbols for Process Displays". ISA SP50 "Field Bus". IEEE C37.1 "Standard Definition, Specification, and Analysis of Systems Used for Supervisory Control, Data Acquisition, and Automation Control". UIT "International Telecommunications Union". IEEE, Standard 1046 "Application Guide for Distributed Digital Control and Monitoring for Power Plants". IEEE, Standard 1249 "Guide for Computer-Based Control for Hydroelectric Power Plant Automation". IEEE, Standard 1010 "Guide for Control of Hydroelectric Power Plant". ISO 11064 "Ergonomic Design of Control Centres". |

| | Materials | Specifications |
|----|--|---|
| 63 | Input and output modules, relays, control system equipment | IEEE C37.90 "Standard for Relays and Relay Systems Associated with Electrical Power Apparatus". IEEE, Standard C37.90.1 "Surge Withstand Capability (SWC), Test for Protective Relays and Relays Systems". |
| 64 | Terminal boards, terminal blocks | NEMA ICS 4 "Terminal Blocks for Industrial Control Equipment and Systems". |
| 65 | Equipment enclosures and cubicles | IIEC 60529, "Degrees of Protection Provided by Enclosures (IP Code)". COVENIN 540:1998, "Degrees of Protection Provided by Enclosures (Boxes and Enclosures) Used in Medium and Low Voltage IP Code". NEMA ICS 6, "Enclosures for Industrial Controls and Systems". NEMA 250 "Enclosure for Electrical Equipment". IEEE, Standard C37.21 "Standard for Control Switchboards". NEMA PB1 "Panel Boards". |
| 66 | Air circuit breakers | NEMA AB 1, "Molded Case Circuit Breakers". |
| 67 | Indicator instruments | ANSI C39.1, "Requirements for Electrical Analog Indicating Instruments". |
| 68 | Metal tanks and vessels submitted to pressure | ASME "Boiler and Pressure Vessel Code", Section VIII, Division 1. |
| 69 | Lubricating greases | Industrial type, Class EP-2, fabricated by recognized Venezuelan companies. |
| 70 | Hard chromium plating for servomotor stem and jacks | ASTM B177, "Standard Practice for Chromium Electroplating on Steel for Engineering Use". The minimum thickness of the chromium plating should be 0.08 millimeters after machining. The chromium plating should be carried out in two (2) stages. The thickness of each coating should not exceed 0.05 millimeters. |
| 71 | VC tubing, flanges and accessories | ASTM D1784, type IV, Gr 1, class 150 #, Sch. 80, according to AWWA C900. |

| | Materials | Specifications |
|----|---------------------|---|
| 72 | Nonmetallic gaskets | ANSI B16.21, "Non Metallic Gasket for Pipes Flanges". |

| | Materials | Specifications |
|----|--------------------------|--|
| 73 | Equipment communications | <p>IEEE Standard 488.1 “Digital Interface for Programmable Instrumentation”.</p> <p>IEEE 802.3 “Standard for Information Technology, Telecommunications and Information Exchange Between Systems. Local and Metropolitan Area Networks Specific Requirements. Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications”.</p> <p>EIA Standard RS232-C “Interface Between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange”.</p> <p>EIA Standard RS422 “Electrical Characteristics of Balance Voltage Digital Interface Circuits”.</p> <p>EIA RS485 Standard</p> <p>DNP “Distributed Network Protocol Standard”</p> <p>Profibus Standard (IEC 61158 Type 3)</p> <p>Fieldbus Foundation (IEC 61158 Type 5)</p> <p>ICCP “Inter-Control Center Communication Protocol Standard”</p> <p>IEEE 802.3 “Ethernet Standard”</p> <p>DeviceNet “Open Network Standard”</p> <p>LonWorks “Standard for Control Networking”</p> <p>Modbus Standard</p> <p>IEC 60870-5-101 “Companion Standard for Basic Telecontrol Tasks”</p> <p>IEC 60870-5-102 “Companion Standard for the Transmission of Integrated Totals in Electric”</p> <p>IEC 60870-5-103 “Companion Standard for the Information Interface of Protection Equipment”</p> <p>IEC 60870-5-104 “Network Access for IEC 60870-5-101 using Standard Transport Profiles”</p> <p>IEC 61850 “Communication Networks and Systems in Substations”</p> <p>UIT-T Standards V.24; V35 and G703 IEC 60870-5-103 “Companion Standard for the Information Interface of Protection Equipment”</p> |

| | Materials | Specifications |
|----|-----------------------------------|--|
| 74 | Control system, protective relays | <p>IEC 1000-4-1 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 1 Overview of Immunity Tests”.</p> <p>IEC 1000-4-2 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 2 Electrostatic Discharge Immunity Tests”.</p> <p>IEC 1000-4-3 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 3 Radiated Electrostatic Discharge Immunity Tests”.</p> <p>IEC 1000-4-4 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 4 Electrical Fast Transient Immunity Tests”.</p> <p>IEC 1000-4-5 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 5 Surge Immunity Tests”.</p> <p>IEC 1000-4-6 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 6 Immunity to conducted disturbances, induced by radio-frequency fields”.</p> <p>IEEE Std C37.90.2 (IEC 1000-4-3) “Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers”</p> <p>IEC 1000-4-11 “Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurements Techniques - Section 11 Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests”.</p> |

4 EQUIPMENT DATA AND SPECIFIC REQUIREMENTS

4.1. Governor

General

Existing analogue type governor regulator and actuator for unit no. 1 and unit no.2 of Bajina Basta Pumped Storage Hydroelectric Power Plant shall be removed and replaced by a new digital type governor regulator and updated actuator.

4.1.1. Scope of supply

The following equipment and components for Unit no.1 and Unit no.2 shall be rehabilitated:

4.1.1.1. Replacement of governors: 1 set for each unit

The existing governor for each Unit located at turbine floor shall be removed and replaced by a new governor comprised as follows:

- (a) Replacement of valve sheets and valve pistons of main distributing valve and slow closing valve mounted in main distributing valve case
- (b) Replacement of converter and control piston
- (c) Replacement of gate opening/closing rate limit mechanism
- (d) Replacement of shutdown mechanism
- (e) Replacement of slow closing mode change valve
- (f) Replacement of following 3 solenoids operated valves for governor
 - Shutdown solenoid valve
 - Oil cut off solenoid valve
 - Emergency shutdown solenoid valve
- (g) Replacement of restoring mechanism for distributing valve and existing servomotors
- (h) Replacement of speed detector from PMG to SSG
- (i) Replacement of whole regulator
- (j) Replacement of associated components shall be, but not limited to, as follows:
 - Bolts, nuts, packings, flanges, pipes, connections, keys, dowels, etc. for installing the actuator on and fitting it to the existing oil sump tank top cover, distributing valve, servomotor, pipes and fittings. Those materials for installing the restoring mechanism on the existing servomotors shall also be provided.
 - Bolts, nuts for installing the regulator cabinet on the existing channel base
 - Wires, cables and terminals, etc., if necessary, for connecting to the existing actuator cabinet, servomotor, speed signal generator and control boards, and those for connecting between the actuator and regulator

The existing actuator board, main distributing valve case and stop valve in the case, and channel base for a regulator board shall remain un-replaced and they shall be re-used.

4.1.1.2. Mandatory spare parts:1 set for two units

The following mandatory spare parts for governor shall be provided:

| | | |
|-------|---------------------------------------|-----------------------------------|
| (a) | Converter: | 2 sets |
| (b) | Each type of deferential transformer: | 1 set each |
| (c) | Control valve and valve sheet: | 1 set |
| (d) | Pressure gauge for converter: | 1 set |
| (e) | Pressure switch for converter: | 1 set |
| (f) | Electromagnetic pilot valve: | 2 sets |
| (g) | Each type of O ring: | 1 piece each |
| (h) | Filter element: | 20 pieces |
| (i) | Each type of printed circuit boards: | 1 set each for governor regulator |
| i) | CPU board | 1 pc |
| ii) | Frequency converter board | 1 pc |
| iii) | Analog input board | 1 pc |
| iv) | Analog output board | 1 pc |
| v) | Digital input board | 1 pc |
| vi) | Digital output board | 1 pc |
| vii) | Network communication board | 1 pc |
| viii) | I/O terminal | 1 pc |
| ix) | Analog input module | 1 pc |
| (j) | Power supply unit: | 1 pc |
| (k) | Auxiliary relay: | 1 pc per each type |
| (l) | TC-NET hub: | 1 pc |
| (m) | Monitor diaplay: | 1 pc |

4.1.1.3. Maintenance tool

One (1) piece of laptop with Governor regulator software installed shall be provided for maintenance and diagnostics purposes.

Governor Regulator SW Installation disc with license shall be also provided.

4.1.2. Technical requirements

4.1.2.1. Governor requirements

Each governor shall have adequate capacity to control the turbine under all conditions. At all loads it shall regulate the pump-turbine to a uniform speed free from hunting or surging and shall cause the unit to operate satisfactorily in parallel with the other units of the power station and in the interconnected system. Steady-state power output of the pump-turbine shall not deviate from the specified value by more than $\pm 0.5\%$ of rated output.

The Contractor shall supply the governor to comply with the operating conditions specified.

The IEC Publication 60308 "International Code for Testing of Speed Governing Systems for Hydraulic Turbines" shall be an integrated document for the governor specification, except where specified otherwise.

As the distributing valve case of the existing governor located on the sump tank shall be remain un-replaced and they shall be re-used, the design, manufacturing and workmanship of the components mounted in the distributing valve case such as valve sheets and valve pistons of a distributing valve and a slow closing valve shall comply with the requirements from the existing components.

4.1.2.2. Type and description

The governor regulator shall be of electro-hydraulic type suitable with digital speed regulator having proportional, integral and derivative (P.I.D.) functions for quick response and stable control.

The speed detector for the governor regulator shall use SSG instead of existing PMG.

The governor regulator cabinet shall be designed to suit the requirements of the existing group control board, which is installed in the turbine floor.

The governor shall be suitable to accept an overall network control signals and shall allow for easy switching over from automatic control to manual control and vice versa at any load.

The governor shall be capable of operating the existing gate servomotors to obtain the minimum opening and closing times for the pump-turbine as required by the opening and closing characteristics. It shall be possible to adjust, independently and within an ample range, the closing and opening rates of the gate servomotors.

4.1.2.3. Capacity

The governor shall be capable of operating the main servomotors in accordance with pump-turbine operating conditions. The opening and closing times shall be adjustable within ample ranges.

This adjustment shall positively restrict the flow of oil so that the operation of any control, safety, or auxiliary device cannot cause the main servomotors to move at a rate exceeding the maximum for which the adjustment has been set. Secure and rigid means shall be provided to prevent unauthorized changing of the opening or closing times after commissioning.

4.1.2.4. Static and dynamic characteristics

Suitable characteristics shall be incorporated in the governor with adequate adjustment such that acceptable performance can be achieved.

The speed droop / regulation shall be adjustable from 0 to 10 %.

The proportional gain, integral gain and derivation gain shall be continuously adjustable.

Means shall be provided to permit rapid load control when the unit is connected to the power system.

For any size load rejection on the turbine, the governor shall cause the speed of the pump-turbine to return to a level corresponding to the setting of the command signal and stabilize with a minimum logarithmic decrement.

The servomotor dead time shall be less than or equal to 0.2 seconds.

The speed dead band shall be less than or equal to 0.02 % of the rated speed.

All necessary feedback signals for the governing system shall be provided. A failure in the restoring system shall cause the governor to stay in its position and initiate an alarm.

The speed and/or load command signals shall be manually adjustable from the regulator cabinet by “manual” / “automatic” selector provided on the regulator cabinet, and have a dial calibrated in percent of output power of the Unit, or percent of main servomotor stroke.

The speed command signal shall range from 85 % of the rated speed at zero load and zero speed droop / regulation to 105 % of the rated speed at the rated load and maximum speed droop / regulation.

Command signals shall be provided to permit remote electric control.

4.1.2.5. Gate opening limits

The gate shall be provided with opening limits manually operated by a control device in the regulator and with dial calibrated in percent of their respective maximum range. The gate opening limits shall be effective for all modes of governor operation.

It shall be possible to remotely control the gate opening limits.

4.1.2.6. Solenoid operated valves

The existing solenoid operated valves in the governor actuator shall be removed and replaced by new solenoid valves.

4.1.2.7. Restoring mechanism on the existing servomotors

A complete restoring mechanism giving suitable signals to the PID governor supplied shall be provided and installed on the existing pump-turbine servomotor.

The differential transformers, their operating mechanism and base plates shall be securely mounted on the existing servomotor.

The differential transformers shall be moisture resistant under conditions of temperature up to 40 deg C and humidity up to 95%. The non-linearity of transducers shall be less than 0.5%.

4.1.2.8. Speed measuring device

(a) Speed measuring device shall be furnished by the Supplier as the source for the speed governor.

The speed signal for the speed regulation shall be consisting of toothed wheel and magnetic sensor The speed measuring uncertainty shall not be greater than 0.01%

The pulse generator for speed control which is composed of a toothed wheel and magnetic sensor shall be provided by the Supplier for over speed detection and speed relays.

(b) The Supplier shall provide speed relays for the unit control. The setting error shall not exceed 1 %.

The following speed relays with given setting shall be provided:

| <u>Device number</u> | <u>Description</u> |
|----------------------|--------------------------|
| 12-1 | for over speed detecting |
| 12-2 | for over speed detecting |
| 13 | for excitation |
| 14-1 | for braking |
| 14-2 | for braking |
| 14-3 | for creep detecting |

4.1.2.9. Governor regulator board (Replace)

The governor regulator board shall be fully renovated except channel base; therefore, new governor regulator board design shall be coordinated with existing channel base, and related governor actuator board and turbine control board.

The existing governor regulator board specification is followings.

Type: Indoor type

Board size: 700mm(W) x 2000mm(D) x 2300mm(H)

Board color: Munsell's color notation 7.5BG 6/1.5

4.1.2.10. Governor actuator board (Reuse)

The existing governor actuator board itself shall be reused; therefore new actuator structure and layout shall be coordinated to fit existing board structure, if modification of existing governor actuator board is required, the Supplier shall be issued design sheet at detail design stage, and the Purchaser will review. And, the modification of existing governor actuator board shall be done by the Supplier.

The existing governor regulator board specification is followings.

Type: Indoor type

Board size: 2000mm(W) x 2000mm(D) x 2300mm(H)

Board color: Munsell's color notation 7.5BG 6/1.5

4.1.2.11. Turbine control board (Reuse)

The existing turbine control board itself shall be reused, if modification of existing turbine control board is required, the Supplier shall issue design sheet at detail design stage, and the Purchaser will review. And, the modification of existing turbine control board shall be done by the Supplier.

The existing governor regulator board specification is as follows.

Type: Indoor type

Board size: 2000mm(W) x 2000mm(D) x 2300mm(H)

Board color: Munsell's color notation 7.5BG 6/1.5

4.2. Automatic Frequency Control (AFC) and Power Joint Control (JC)

4.2.1. General

Existing analogue type automatic frequency control and power joint control system for Unit no.1, unit Uo.2 of Bajina Basta Pumped Storage Hydroelectric Power Plant shall be removed and replaced by an updated system.

Both existing AFC and JC system function shall be realized same function by PLC with its software.

4.2.2. Scope of Supply

4.2.2.1. General

(a) The scope of supply shall cover the design, engineering, documentation, manufacture, factory assembly, inspection and testing, pre-commissioning test, commissioning test and training of operators, engineers and maintenance personnel.

(b) All the interface points of the AFC/JC shall be take the form of a terminal block or other connection system.

The Supplier shall provide all prefabricated cables and special cables as required for the supplier's equipment including fiber optical cables with accessories.

(c) The numbers of input/output points shall be provided as sufficient with additional spare of 10 % at least.

4.2.2.2. Items Included

(a) The AFC/JC board shall apply the following requirements for design and construction.

Type: Indoor type

Protection class: IP40

Cubicle: Height 2300mm, Width 800mm, Depth 800mm, board thickness 1.5mm

Color Munsell's color notation 5Y7/1

(b) The AFC/JC shall include the following major hardware and software.

- One (1) set of power supply unit

- One (1) set of CPU
 - One (1) set of I/O unit
 - One (1) set of HMI
 - Two (2) sets of power transducer
 - One (1) set of AFC function software
 - One (1) set of JC function software
- (c) Spare parts, special tools and test equipment.
- (i) The Supplier be supply following spare parts.
- Each one (1) pc of power supply unit
 - Each one (1) pc of CPU
 - Each one (1) pc of I/O module
 - One (1) pc of HMI
 - Each one (1) pc of power transducer
 - Each one (1) pc of Auxiliary relay
 - Each ten (10) pcs of fuse
- (ii) The Supplier be supply one (1) complete set of special tools required for the installation, operation, and maintenance of the purchased equipment not commonly available.
- (iii) One (1) piece of laptop with AFC/JC function software installed shall be provided for maintenance and diagnostics purposes.

AFC/JC function software Installation disc with license shall be also provided.

(d) Installation

The Supplier shall complete as follows:

- (i) Supply of foundation bolts, channel bases and supports for the AFC/JC board.
- (ii) Field test and startup of all supply items.
- (iii) SAT (Site Acceptance Test)

4.2.3. Performance Requirements

The AFC/JC system shall perform in a stable manner under steady-state and transient conditions. When operating at steady-state conditions, the measured variables shall be controlled at set point without cycling, hunting, or other objectionable characteristics.

The speed of response of the control system as a whole shall be fast enough to operate the turbine and generator, electrical equipment and auxiliaries safely under any conceivable upset. The control system itself shall not be a limiting factor on mechanical system operation.

The AFC/JC signal interface instruments shall be capable of sustaining stable operation over the full load range without any upset or unstable operation.

The AFC/JC system performance requirements shall regulate the relation between control performance capabilities that end user expects and the possibilities of accomplishment.

The AFC/JC system shall have high reliability and availability.

4.2.4. Design Requirements

The following describes the features that are required to incorporate as a minimum the design of AFC/JC. It is the sole responsibility of the Supplier to furnish complete designs that best meet instrumentation, electrical, and control requirements called for performing stable and efficient operation of the Pump-Turbine and Generator-Motor.

In general, all devices furnished under these specifications and requiring electrical connections shall be designed for wiring into electrical enclosures with terminal blocks. The terminal blocks shall be furnished for conductors requiring connection to circuits external to the specified equipment, for internal circuits crossing shipping splits, and where equipment parts replacement and maintenance will be facilitated. Splices will not be permitted. All wiring leaving an enclosure shall leave from terminal blocks and not from other devices in the enclosure.

All electrical equipment that is part of an integral shipping unit or assembly shall be furnished with two grounding conductors extending to two central ground connection lugs. The lugs shall be suitable for field connection to the station ground grid. Isolated logic system or single-point ground connections required for proper operation of electronic equipment shall be insulated from the equipment safety ground. Such connections shall be extended, using insulated cable, to a single termination point suitable for field connection to the appropriate ground system by others.

All terminal blocks shall be disconnection type with rated 600 volts, minimum. Terminal blocks shall be appropriately sized for larger wire size or higher voltage insulated incoming conductors as necessary.

Electrical accessory devices shall be furnished in accordance with the requirements stated herein unless otherwise specified in the detailed specification sections.

Where current carrying requirements exceed the capacity of the general service auxiliary relays shall be used.

Software performance shall be demonstrated to the satisfaction of customer to show that all software to be used in any process, including those provided in program preparation and examination equipment, will execute strictly in accordance with the specification. The software support program shall be designed to allow the pre-designed software control blocks to be added, modified, deleted or copied, to assign signal conditioning for input/output or to display a list of control systems.

5 TESTS

5.1. General

Tests shall be performed in order to determine whether the material and equipment comply with the specified requirements.

Testing shall comply with all technical requirements. Unless otherwise agreed with the Employer, all tests on the materials and equipment shall be made in accordance with Standards defined in the Tender Documents. If some of the tests have not been defined in the mentioned Standards, the Supplier shall submit the testing methodology he proposes to implement to the Employer for approval.

The lists of tests do not preclude the Employer's right to ask for additional tests if he considers these tests necessary, at no extra costs to the Employer.

During manufacturing process, representatives of the Employer shall be present at hold points to be mutually agreed with the manufacturer.

Routine tests shall be carried out on each piece of the equipment to be supplied for the purpose of revealing faults in material or construction. The tests shall not impair the properties and reliability of the object tested, or reduce its lifetime.

Factory acceptance tests (FAT) shall be conducted at the laboratory of the manufacturer in the presence of the End User, before shipping.

Measuring instruments and equipment required for testing are the obligation of the Supplier.

5.2. Workshop Tests

In addition to the general testing requirements specified within the General Technical Specifications, the below mentioned requirements shall also be applied.

Unless otherwise specified, the workshop tests shall be carried out for all the equipment in accordance with the IEC Publications.

During the FAT, relevant technical documentation in Serbian and/or English language shall be reviewed on completeness.

The Supplier shall notify the Employer at least 4 weeks in advance of the date of Factory Acceptance Test, in order to allow the presence of the Employer. Three (3) representatives of the Employer are foreseen to be attended FAT. Accommodation fee for these 3 representatives of the Employer shall be included in the quotation. Accommodation shall be arranged in up to four stars hotel (breakfast included), placed at appropriate location regarding transportation to the FAT facilities.

The test results will be submitted to the Employer immediately upon completion thereof.

5.2.1. Type Tests

Type tests may be omitted only if the Supplier submits to the Employer the Certificates on type tests, issued by an independent and recognized laboratory for the equipment of the similar characteristics.

Type tests shall be performed at the manufacturer's factory, on each type of the equipment. During execution of these tests, the auxiliary equipment shall also be installed

and connected, in order to simulate the normal operating conditions as much and as close as possible.

5.2.2. Routine Tests – Factory Acceptance Tests (FAT)

5.2.2.1. GOVERNOR

The Supplier shall be carried out following factory acceptance tests.

- (1) Visual and dimensional inspection
 - Number of panels
 - Dimensions of panels
 - Layout of each device
 - Surface treatment
 - Letters of name plates
 - Colouring
 - Rating of all devices
- (2) Wiring continuity test
 - DC circuit
 - AC circuit
- (3) Measurement of Insulation Resistance
 - Measurement of insulation resistance by using insulation tester. The measurement is carried out before and after the dielectric test.
- (4) Dielectric Strength test
 - It checks that it impresses commercial frequency voltage of 2000V is applied entire control circuit, except low voltage circuit like semiconductor product, to the ground for 1 minute.
- (5) Sequence test
 - Conformation of control logic including alarm and protection.
 - Input-output signal conformation or check of numerical value of measuring circuits.
- (6) Static characteristic test
 - Input-output signal conformation or check of numerical value of measuring circuits.
- (7) Simulation test
 - Control function and operation are checked with guide vane simulator.

Duration of the FAT of Governor is estimated to be one (1) day.

5.2.2.2. JC/AFC

The Supplier shall be carried out following factory acceptance tests.

(1) Visual and dimensional inspection

- Number of panels
- Dimensions of panels
- Layout of each device
- Surface treatment
- Letters of name plates
- Colouring
- Rating of all devices

(2) Wiring continuity test

- DC circuit
- AC circuit

(3) Measurement of Insulation Resistance

- Measurement of insulation resistance by using insulation tester. The measurement is carried out before and after the dielectric test.

(4) Dielectric Strength test

- It checks that it impresses commercial frequency voltage of 2000V is applied entire control circuit, except low voltage circuit like semiconductor product, to the ground for 1 minute.

(5) Sequence test

- Conformation of control logic including alarm and protection.
- Input-output signal conformation or check of numerical value of measuring circuits.

(6) Static characteristic test

- Input-output signal conformation or check of numerical value of measuring circuits.

(7) Simulation test

- Control function and operation are checked with guide vane simulator.

Duration of the FAT of AFC/JC is estimated to be one (1) day plus one day to make FAT reports for Governor and AFC/JC.

5.2.3. Site Tests

On arrival at the Site and prior to their installation, all parts of the equipment shall be inspected and tested so as to ensure that there shall be no delay in execution of works, due to supply of incorrect or damaged equipment.

The Site tests shall be divided into the following groups:

- Tests during and after completion of installation / Pre-commissioning Tests
- Commissioning Tests

5.2.3.1. Tests After Completion of Installation / Pre-commissioning Tests

5.2.3.1.1. GOVERNOR

The Supplier shall be carried out following pre-commissioning test at site.

- (1) Pre-commissioning test
 - Characteristic test of distributing valve
 - Characteristic test of slow closing valve
 - Adjustment and setting of closing and opening time of GV
 - Check of relation between LL and GV
 - Check of governor and turbine control

All the defects and incorrectnesses discovered during implementation of various tests shall be eliminated by the Supplier, at his own expense.

After successful completion of the preliminary tests and with the consent of the Employer, the Commissioning Tests shall commence.

5.2.3.1.2. JC/AFC

The Supplier shall be carried out following pre-commissioning test at site.

- (1) Pre-commissioning test
 - I/O confirmation

5.2.3.2. Commissioning Tests

The main objective of the Commissioning Tests is verification of proper and safe operation of the equipment, particularly confirming of the guaranteed characteristics of the equipment that have been defined in Volume 4: Schedules of Technical Data.

5.2.3.2.1. GOVERNOR

Commissioning test

- SSG wave signal form check
- No load step response test
- Automatic start test
- Relation between #65F and rotation speed
- Load rejection test
- Automatic start/stop test (G mode)
- Automatic start/stop test (P mode)

5.2.3.2.2. JC/AFC

Commissioning test

- AFC function test
- JC function test

5.2.4. Trial Run

Trial run shall start after successful completion of Commissioning Tests. The Trial run shall be performed in compliance with the Clause 5.4 of the General Technical Specifications.

Preliminary Taking-over shall be performed in compliance with the Clause 5.3.2, after completion of the Trail run in the duration of 180 (one hundred and eighty) calendar days from the date of putting into operation.

During this period, the Employer's personnel shall be made fully acquainted with the operation and maintenance of the Governor, AFC/JC and the pertaining equipment.

6 TRAINING

6.1. GOVERNOR

The Supplier shall be carried out following training at factory and site.

6.1.1. Training program at Factory

Governor Actuator – General

- Principal function of governor system
- Structure of actuator

Governor Control – General

- Principal function of governor system

Governor Control

- Governor Maintenance Tool
- Maintenance Tool Operation
- Governor program instruction

Practical Training – Governor

- Exchange Method of the Print Board
- Adjustment of Governor Turbine Speed
- Adjustment of Guide Vane Position
- Adjustment of GV Control Valve Position
- Adjustment of Governor Out Put Voltage

The Governor Training in factory shall take place prior commencement of Governor FAT and shall last two (2) days.

6.1.2. Training program at Site

Practical Training – Governor Actuator

- Case study of installation & testing
- Adjustment of Actuator
- Maintenance Method
- Trouble shooting.

The Governor Training at site shall take place after commissioning tests of Governor and shall last one (1) day.

6.2. JC/AFC

The Supplier shall be carried out following training at factory and site.

6.2.1. Training program at Factory

AFC/JC – General

- Principal function of AFC/JC
- Maintenance Tool Operation

Practical Training – AFC/JC

- Exchange Method of the Print Board
- Adjustment of AFC/JC

The AFC/JC Training in factory shall take place prior commencement of AFC/JC FAT and shall last two (2) days.

6.2.2. Training program at Site

Practical Training – AFC/JC

- Case study of installation & testing
- Adjustment of AFC/JC
- Maintenance Method
- Trouble shooting

The AFC/JC Training at site shall take place after commissioning tests of AFC/JC and shall last one (1) day.

7 TECHNICAL SERVICES FOR GOVERNOR, AFC/JC REHABILITATION

Services shall be within the scope of technical advisory services defined as engineering, technical guidance, advice, and counsel based upon current engineering, manufacturing and operation practices for the equipment involved as to work performed by others.

Items such as supervision, management, regulation, arbitration of the Purchaser’s personnel, agents or other contractors and work thereto, and any kind of responsibility for planning, scheduling, monitoring, or management of the work, shall be out of the scope of services.

7.1 Type of Technical Advisors and Total Estimated Time of engagement

According to Volume 6. Preliminary Project Schedule, the Type of Technical Advisors (TA) and total estimated time of TA engagement is given in the following table:

| Type of Technical Advisor (TA) | Calendar Days | Travelling Days | Sub-total | Round Trip |
|---------------------------------------|----------------------|------------------------|------------------|-------------------|
| GOV Assembly TA | 35 days | 4 days | 39 days | 1 time |
| GOV Testing TA | 38 days | 4 days | 42 days | 1 time |
| Electrical Testing TA | 40 days | 4 days | 44 days | 1 time |
| Quality TA-A | 2 days | 4 days | 6 days | 1 time |
| Quality TA-B | 3 days | 4 days | 7 days | 1 time |
| Total | 118 days | 20 days | 138 days | 5 times |

Daily Working time and weekly working days shall be eight (8) hours per day (from 08:00 AM through 17:00 PM, 1.0 hour break for lunch), and six (6) days per week (Monday through Saturday).

If the night shift or midnight working are required, the prior consensus of site representative is required.

Per Diem Rate is based on 8 hours work from AM 8:00 to 17:00 PM excluding one hour rest time. This Per Diem Rate also applies to the traveling days to project site and/or accommodation in Serbia and the all dispatched period (i.e. duration of departure date to return date).

Overtime of working hourly rate of 150% of the per-hourly rate for normal working day and shall be applied to the overtime work in excess of normal working hours (eight (8) hours on Monday through Saturday).

Working-hourly rate of 150% of the per-hourly rate for normal working day shall be applied to all worked hours in a non-working day in case of work performed on Sunday and National Holiday in Serbia.

7.2. Site Facilities

Office space with air conditioned and furnished including office telecommunication facilities such as telephone, network LAN (sufficient speed to be required), copy, printer and its related cost thereof, shall be provided by the Purchaser for use by the Seller's personnel assigned to site.

7.3. Transportation

The transportation from Belgrade airport to Bajina Basta Pumped Storage Power Plant and vice versa, and daily transportation from accommodation(hotel) to working site is It shall be arranged and provided by the Purchaser free of charge.

7.4. Accommodation

Accommodation fee at working site shall be borne by Seller. The Purchaser shall make arrangement for accommodation, if it is requested by the Seller.

7.5. Security at Site and Access Route

If technical advisor encounters any danger or is considerably hindered in carrying out the work due to any reason beyond the control of the Seller, the technical advisor is allowed to withdraw from the site prior to sending the notice to the Purchaser.

In such case, the Purchaser and Seller shall discuss and look for an amicable solution.

7.6. Replacement of Technical Advisor

If an amount of overtime work is reached at a level which is not allowed by the Labor Laws and regulations of the technical advisor's resident country and/or Serbia, the Seller shall request the Purchaser to replace such technical advisors or dispatch additional technical advisor. This agreement shall not be withheld unreasonably.

VOLUME 4: SCHEDULE OF TECHNICAL DATA

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| A.3. JC/AFC..... | 9 |

A. SCHEDULES OF TECHNICAL DATA

| A.1. GOVERNOR REGULATOR | | | | |
|--------------------------------|---|------|------------------------|---------|
| Clause | Description | Unit | Required | Offered |
| 1.1 | Governor Regulator Cabinet | | | |
| 1.1.1 | Manufacturer | | | |
| 1.1.2 | Type | | | |
| 1.1.3 | Standard | | | |
| 1.1.4 | Mechanical protection degree | | | |
| 1.1.5 | Type designation | | | |
| 1.1.6 | Metal sheet thickness of cubicle | mm | | |
| 1.1.7 | Dimensions: | | | |
| | - Width | mm | | |
| | - Depth | mm | | |
| | - Height | mm | | |
| 1.1.8 | Colour's cubicle (RAL) | | | |
| 1.2. | Governor Regulator Specification | | | |
| 1.2.1. | Aplication Standard | | IEC, JIS, JEC, NEMA | |
| 1.2.2. | System of unit | | ISO metric | |
| 1.2.3. | Input Power Source | | DC 220V AC 220V | |
| 1.2.4. | Transformer of wicket gate opening | | LVDT | |
| 1.2.5. | Turbine speed detector | | SSG | |
| 1.2.6. | PID adjusment range | | | |
| | - Proportional gain | | | |
| | - Integral Time Constant | | | |
| | - Derivative time constant | | | |

| A.1. GOVERNOR REGULATOR | | | | |
|--------------------------------|---|------|--|---------|
| Clause | Description | Unit | Required | Offered |
| | - Derivative gain | | | |
| 1.2.7. | Setter | | | |
| | - Frequency, Load, WG opening limiter | | SW processing | |
| 1.2.8. | Speed droop | % | 0-10 | |
| 1.2.9. | Speed adjustment range | % | 85 - 115 | |
| 1.2.10. | Insensitivity | % | 0 +/- 2 | |
| 1.2.11. | Dead Band | % | 0.02 or less | |
| 1.2.12. | Dead Time | Sec | 0.25 or less (incl. Actuator) | |
| 1.2.13. | Fault detection | | CPU fault, Printed circuit board fault, Input signal fault | |
| 1.2.14. | Input/Output signal | | | |
| | DI: - Governor on/off - On-line condition - Turbine mode - Pump mode - Turbine manual operation - Freq. Setter raise/lower - Load Setter raise/lower - Recording triggering signal DO: - Load Setter upper/lower limit - Load Setter pre-set position signal - WG upper/lower limit - WG Setter pre-set position signal - Governor failure AI: - WG opening signal - Turbine speed signal - Main distributing v. Opening signal AO: - Main distributing v. control signal - Load limiter position signal | | x x x x x x x x x x x x x x x x x x | |

| A.1. GOVERNOR REGULATOR | | | | |
|--------------------------------|--|------|----------|---------|
| Clause | Description | Unit | Required | Offered |
| | - WG Opening signal | | x | |
| 1.3. | Operator's Panel | | | |
| 1.3.1 | Manufacturer | | | |
| 1.3.2 | Country of origin | | | |
| 1.3.3 | Type designation | | | |
| 1.3.4 | Standards | | | |
| 1.3.5 | Dimensions: | | | |
| | - Width | | mm | |
| | - Depth | | mm | |
| | - Height | | mm | |
| 1.4 | PLC | | | |
| 1.4.1 | Manufacturer | | | |
| 1.4.2 | Country of origin | | | |
| 1.4.3 | Type designation | | | |
| 1.4.4 | Standards | | | |
| 1.4.5 | System software (name and version) for PLC | | | |
| 1.4.6 | Voltage supply | V | | |
| 1.4.7 | Allowed voltage interruption | ms | | |
| 1.4.8 | Memory | | | |
| 1.4.9 | Real time clock: | | | |
| | - Accuracy | ms | | |
| | - Type of synchronization | | | |
| 1.4.10 | Communication interface | | | |
| | - Type | | | |

| A.1. GOVERNOR REGULATOR | | | | |
|--------------------------------|---|----------|----------|---------|
| Clause | Description | Unit | Required | Offered |
| | - Protocol | | | |
| 1.4.11 | Programming in accordance with IEC 61131-3 standard | Yes / No | | |
| 1.4.12 | Analogue Input Module | | | |
| | - capacity | | | |
| | - insulation voltage | kV | | |
| | - input signals | mA | | |
| | - input resistance | ohm | | |
| | - resolution | bit | | |
| | - speed | Sign/s | | |
| | - errors | % | | |
| 1.4.13 | Binary Input Module | | | |
| | - capacity | | | |
| | - galvanic protection, type | | | |
| | - insulation voltage | kV | | |
| | - input voltage, rated | V | | |
| | - input voltage, binary "0" | V | | |
| | - input voltage, binary "1" | V | | |
| | - input current for rated voltage | mA | | |
| 1.4.14. | Digital Output Module | | | |
| | - capacity | | | |
| | - galvanic protection, type | | | |
| | - insulation voltage | kV | | |
| | - maximum change-over voltage | V DC | | |
| | - maximum continuous current | A | | |

| A.1. GOVERNOR REGULATOR | | | | |
|--------------------------------|------------------------------------|-------------|----------|---------|
| Clause | Description | Unit | Required | Offered |
| | - transient resistance of contacts | mohm | | |
| | - electric continuity of contacts | | | |
| | *at 60 V DC, 0.8 A | No of oper. | | |
| | *at 220 V DC, 0.35 A | No of oper. | | |
| | - command impulse duration | s | | |

| A.2. GOVERNOR HYDRAULIC PARTS | | | |
|--------------------------------------|--|--|-----------------------|
| Clause | Description | Required | Offered |
| | | Dwg No. Draw Title | Dwg No. Draw Title |
| 2.1 | Valve sheets and valve pistons of main distributing valve and slow closing valve mounted in main distributing valve case | P-60 055 001 - Parts list for main distributing valve device - Parts list for slow closing valve | |
| 2.2 | Converter and control piston | P-60 055 008 P-60 055 009 - Parts list for converter device - Parts list for Aux. servomotor device | |
| 2.3 | Gate opening/closing rate limit mechanism | P-60 055 007 - Parts list for load limit device | |
| 2.4 | Shutdown mechanism | P-60 055 000 - Parts list for main distributing valve device | |
| 2.5 | Slow closing mode change valve | P-60 055 004 - Parts list for distributing valve for slow closing valve | |
| 2.6 | Shutdown solenoid valve | E-6S10038 PAGE 15-17 - Instructions for water turbine control system | |
| 2.7 | Oil cut off solenoid valve | E-6S10038 PAGE 15-17 - Instructions for water turbine control system | |
| 2.8 | Emergency shutdown solenoid valve | E-6S10038 PAGE 15-17 - Instructions for water turbine control system | |
| 2.9 | restoring mechanism for distributing valve and existing servomotors | P-60 055 006 - Parts list for restoring mechanism | |

| A.3. JC/AFC | | | | |
|--------------------|----------------------------------|------|----------|---------|
| Clause | Description | Unit | Required | Offered |
| 3.1 | JC/AFC Cabinet | | | |
| 3.1.1 | Manufacturer | | | |
| 3.1.2 | Type | | | |
| 3.1.3 | Standard | | | |
| 3.1.4 | Mechanical protection degree | | | |
| 3.1.5 | Type designation | | | |
| 3.1.6 | Metal sheet thickness of cubicle | mm | | |
| 3.1.7 | Dimensions: | | | |
| | - Width | mm | | |
| | - Depth | mm | | |
| | - Height | mm | | |
| 3.1.8 | Colour's cubicle (RAL) | | | |
| 3.2 | Operator's Panel | | | |
| 3.2.1 | Manufacturer | | | |
| 3.2.2 | Country of origin | | | |
| 3.2.3 | Type designation | | | |
| 3.2.4 | Standards | | | |
| 3.2.5 | Dimensions: | | | |
| | - Width | | mm | |
| | - Depth | | mm | |
| | - Height | | mm | |
| 3.3 | PLC | | | |
| 3.3.1 | Manufacturer | | | |
| 3.3.2 | Country of origin | | | |

| A.3. JC/AFC | | | | |
|--------------------|---|----------|----------|---------|
| Clause | Description | Unit | Required | Offered |
| 3.3.3 | Type designation | | | |
| 3.3.4 | Standards | | | |
| 3.3.5 | System software (name and version) for PLC | | | |
| 3.3.6 | Voltage supply | V | | |
| 3.3.7 | Allowed voltage interruption | ms | | |
| 3.3.8 | Memory | | | |
| 3.3.9 | Real time clock: | | | |
| | - Accuracy | ms | | |
| | - Type of synchronization | | | |
| 3.3.10 | Communication interface | | | |
| | - Type | | | |
| | - Protocol | | | |
| 3.3.11 | Programming in accordance with IEC 61131-3 standard | Yes / No | | |
| 3.3.12 | Analogue Input Module | | | |
| | - capacity | | | |
| | - insulation voltage | kV | | |
| | - input signals | mA | | |
| | - input resistance | ohm | | |
| | - resolution | bit | | |
| | - speed | Sign/s | | |
| | - errors | % | | |
| 3.3.13 | Binary Input Module | | | |
| | - capacity | | | |

| A.3. JC/AFC | | | | |
|--------------------|------------------------------------|-------------|----------|---------|
| Clause | Description | Unit | Required | Offered |
| | - galvanic protection, type | | | |
| | - insulation voltage | kV | | |
| | - input voltage, rated | V | | |
| | - input voltage, binary "0" | V | | |
| | - input voltage, binary "1" | V | | |
| | - input current for rated voltage | mA | | |
| 3.3.14. | Digital Output Module | | | |
| | - capacity | | | |
| | - galvanic protection, type | | | |
| | - insulation voltage | kV | | |
| | - maximum change-over voltage | V DC | | |
| | - maximum continuous current | A | | |
| | - transient resistance of contacts | mohm | | |
| | - electric continuity of contacts | | | |
| | *at 60 V DC, 0.8 A | No of oper. | | |
| | *at 220 V DC, 0.35 A | No of oper. | | |
| | - command impulse duration | s | | |

B. TECHNICAL DOCUMENTATION

1. Technical Documentation to Be Submitted with the Tender

Together with the Tender, completed with appropriate Schedules of Technical Data duly filled in, the Tenderer shall submit the following documents:

- Short technical description of the new systems, General arrangement drawings, showing details of all associated equipment and accessories, block schemes, etc,
- Reference List acc to Vol. 0, clause 7.7.
- Descriptive catalogues and literature about offered equipment mentioned in this Tender Documentation.

2. Technical Documentation to Be Submitted after Contract Signing

The awarded Supplier shall submit a detailed Plan and Programme of Contract execution (Time Schedule) as soon as possible but not later than 60 (sixty) days as from the contract effective date. This plan and programme shall include minimum the following:

- Detailed layout drawings showing particulars of all associated equipment and accessories, the overall dimensions, shipping and lifting dimensions, mass of the complete cubicles, etc.
- Schematic diagrams of controls and signalling, including all details, which are the subject of prior agreement, harmonization and certifying.
- Manufacture plan and programme.
- Installation, testing, operation and maintenance instructions.
- Factory Tests Plan and Programme, Proposal of test protocol, which are the subject of prior agreement, harmonization and certifying.
- Schedule of Delivery.

The awarded Supplier is bound to supply all documentation, as well as all rating and name plates for equipment in Serbian language. The documentation that is previously agreed and certified shall be furnished in three (3) copies in both paper and electronic forms (hard and soft copies).

VOLUME 5: SCHEDULES OF PRICES

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| Table 2. PRICE FOR TECHNICAL SERVICES..... | 4 |

Table 1. PRICE FOR DELIVERY of the EQUIPMENT

| No. | Description | Quantity (pc) | Fill in by domestic Tenderer | Fill in by Foreign Tenderer | | VAT** | Total Price VAT excl. (3) x [(4)] or (3) x [(5)+(6)] | Remark |
|---------------------|---|---------------|---------------------------------------|------------------------------------|---------|-------|--|--------|
| | | | Unit price Parity HPP Bajina Bašta | Unit price DAP HPP Bajina Bašta | Custom* | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1. | Governor Actuator | 2 | | | | | | |
| 2. | Governor Regulator | 2 | | | | | | |
| 3. | AFC/JC | 1 | | | | | | |
| 4. | Spare parts for Actuator, Regulator, AFC/JC | 1 set | | | | | | |
| TOTAL PRICE: | | | | | | | | |

* Don't fill-in, for evaluation purpose only!

** Don't fill-in, for informative purpose only!

Prices are expressed in currency: _____

Deliverer's Signature _____

Table 2. PRICE FOR TECHNICAL SERVICES

| No. | Type of Technical Advisor (TA) | Estimated No. calendar days of engagement | Per diem Rate | Estimated No. of Round Trips | Round Trip Fare | Total Price VAT excl. (3) x [(4)] + (5) x [(6)] |
|-----------|--------------------------------|---|---------------|------------------------------|-----------------|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1. | Runner Assembly TA | 39 days | | 1 time | | |
| 2. | Runner Testing TA | 42 days | | 1 time | | |
| 3. | Electrical Testing TA | 44 days | | 1 time | | |
| 4. | Quality TA-A | 6 days | | 1 time | | |
| 5. | Quality TA-B | 7 days | | 1 time | | |
| 6. | Total | 138 days | | 5 times | | |

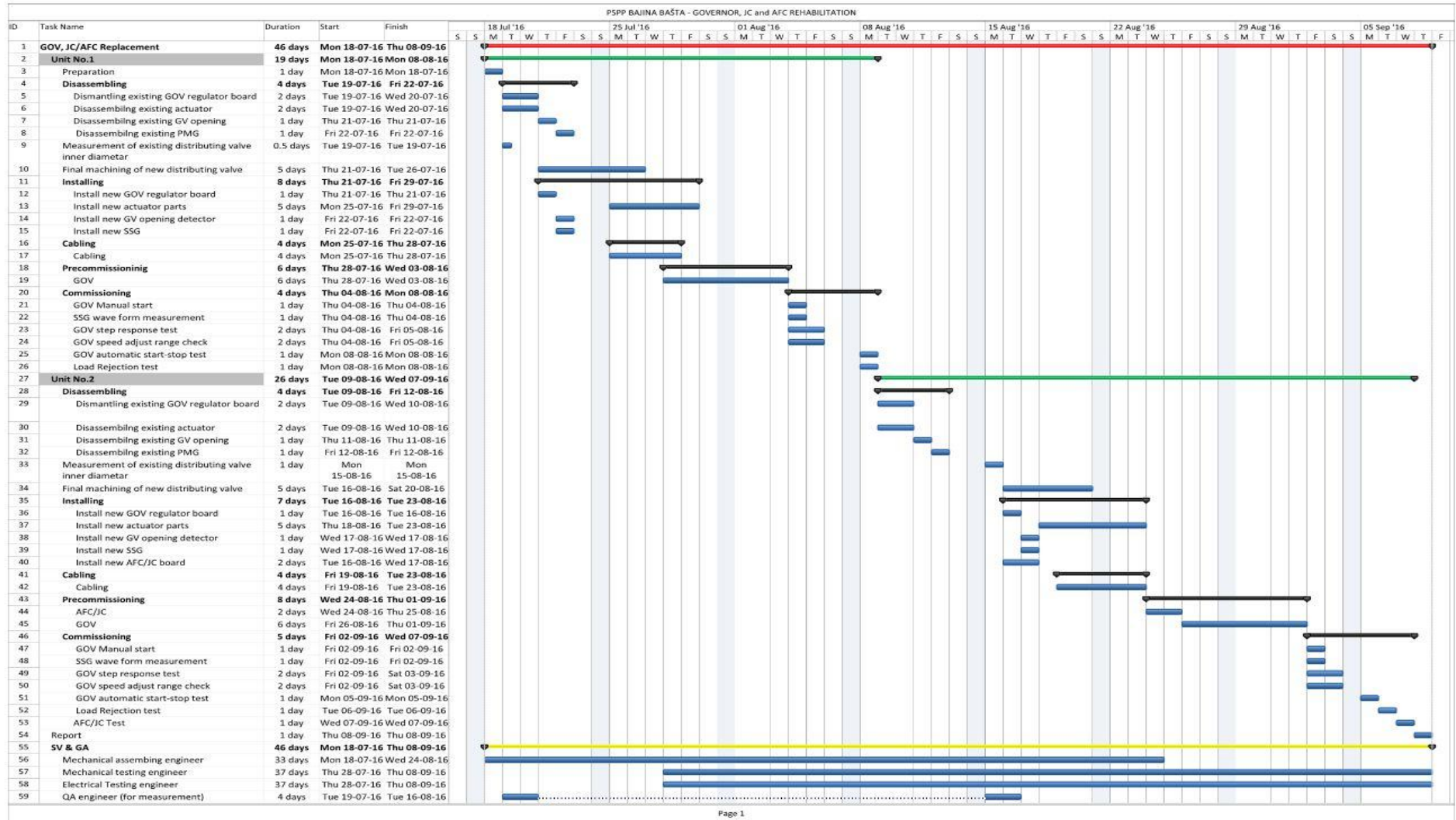
The above breakdown and total price are based on Preliminary Project schedule. If the schedule is extended due to causes attributable to the Purchaser, additional cost shall be charged.

If the schedule is shortened, the price shall be paid by actual man-day and overtime.

Prices are expressed in currency: _____

Deliverer's Signature _____

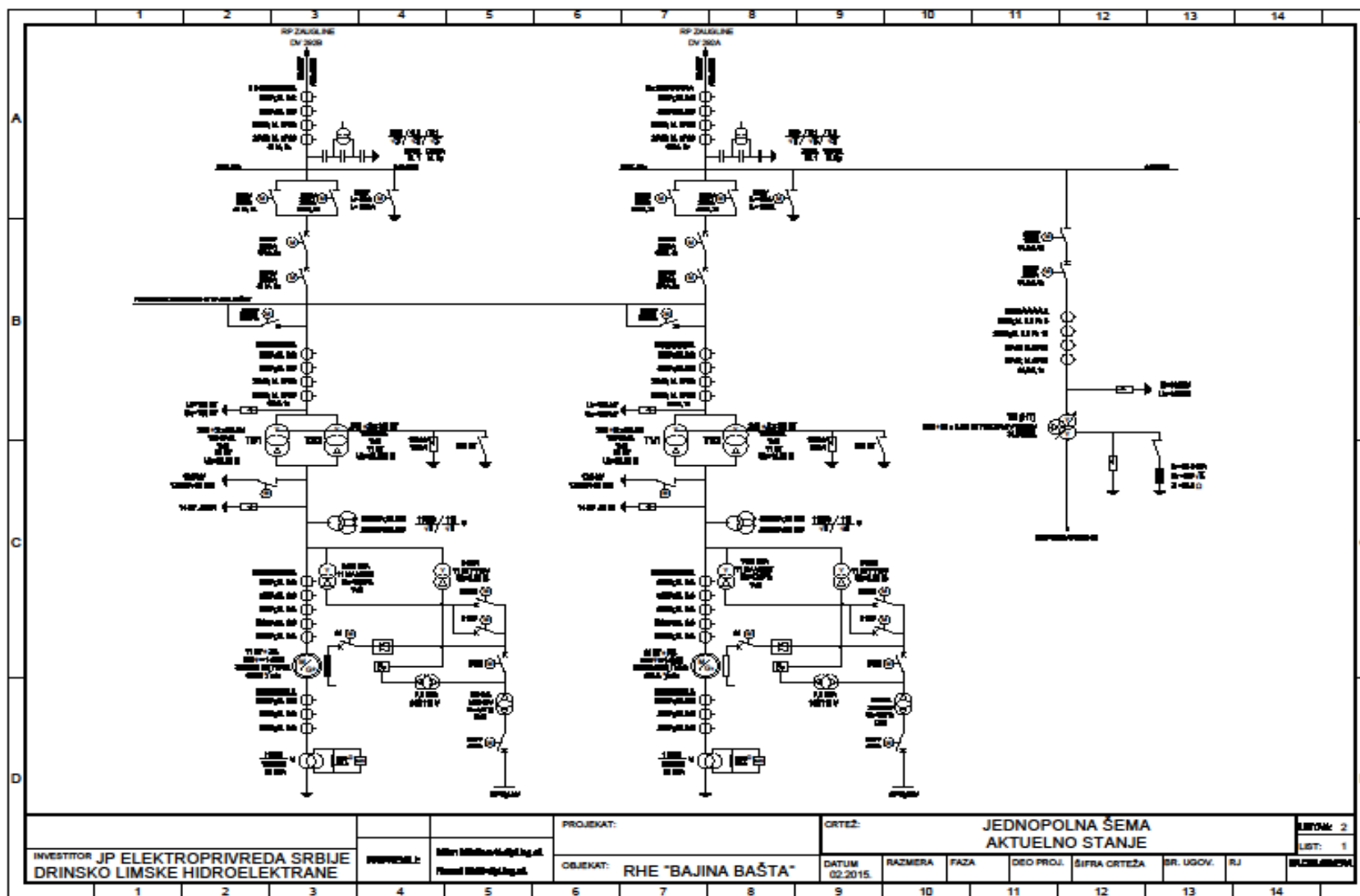
VOLUME 6: PRELIMINARY PROJECT SCHEDULE

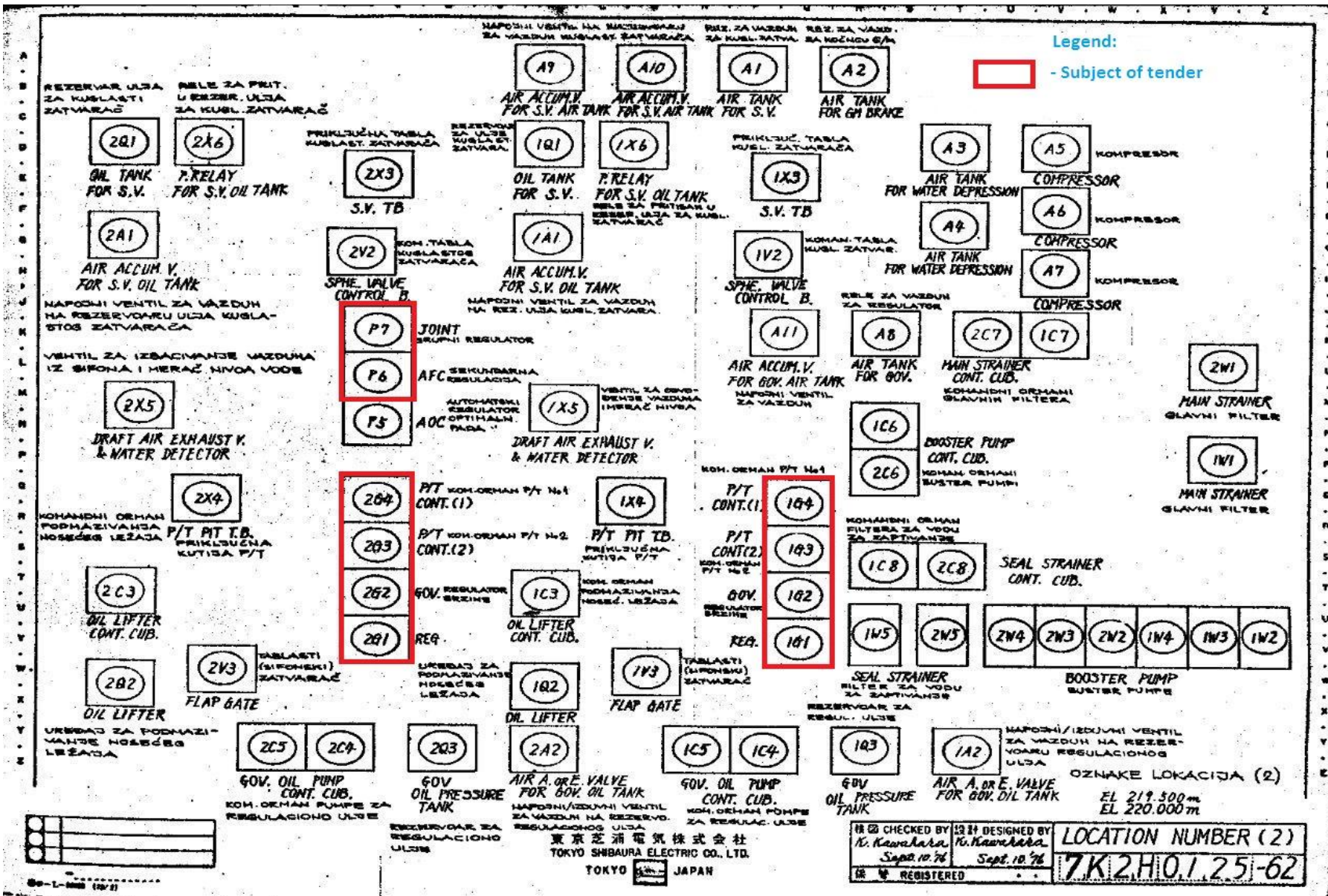


VOLUME 7. DRAWINGS

CONTENT

- 1. PSPP BAJINA BASTA SINGLE LINE DIAGRAM**
- 2. LOCATION NUMBER**





Volume 7: Drawings

VOLUME 8. ANNEXES