



**MADHYA BHOTEKOSHI  
JALAVIDYUT COMPANY LIMITED**

**Middle Bhotekoshi  
Hydroelectric Project  
(102 MW)**

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**ADDENDUM NO 1**

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**Lot 2: Electromechanical Works**

(Design, Manufacture, Supply, Installation, Testing and Commissioning of  
Electromechanical Works)

**Contract Identification No.: MBJCL/MBKHEP/069/70/EM-1**

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## 1 Introduction

It has become necessary to introduce a number of changes to the Bidding Documents and therefore this Addendum No. 1 has been issued.

The changes are both of contractual and technical natures and are detailed in the following sections.

## 2 Changes to the Volume 1 Invitation for Bids

The Submission Date has been changed and is now as stated below:

- On or before 12:00 hrs. on the 22<sup>nd</sup> December 2013

The bids shall be opened at 14:00 hrs. on the 22<sup>nd</sup> December 2013.

The existing texts of number 5 has been deleted in its entirety and replaced by the following texts:

“Interested Prequalified Bidders may obtain further information from the office of the Employer (address provided below) during office hours. A complete set of Bid Documents in English may be obtained free of cost from **22<sup>nd</sup> September 2013** to **21<sup>st</sup> December 2013**, during office hours on submission of written application to the address given below.”

The place and other details of the bidding process remain as published in the Invitation for Submission of Bids and the Volume 1 Invitation for Bids in the Bidding Documents.

## 3 Changes to the Volume 1 Instructions to Bidders

### Clause 22 Deadline for Submission of Bids

The last date for bid submission, in accordance with ITB 22.1, shall be changed from the 22<sup>nd</sup> of November 2013 to the 22<sup>nd</sup> of December 2013 at 12.00 hrs.

### Clause 25 Bid Opening

The opening of bids, in accordance with ITB 25.1, shall be changed from the 22<sup>nd</sup> of November 2013 to the 22<sup>nd</sup> of December 2013 at 14.00 hrs.

## 4 Changes to the Volume 1 Particular Conditions of Contract

The following changes shall be made to the Particular Conditions of Contract:

### Volume 1 Particular Conditions of Contract Sub-Clause 4.21

Progress Reports

*Add the following paragraph at the beginning of the sub-clause:*

The Contractor shall submit first monthly progress report covering the period up to the end of the first calendar month following the Commencement Date. Report shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates. Reporting shall continue until the Contractor has completed all the Works and defects have been remedied and Completion Certificate has been issued by the Engineer in accordance with the Conditions of the Contract.

*After the paragraph "Each monthly report shall include the contents listed in the General Conditions and additionally .....at least the following:"*

Add the following texts:

- a) Report of design, procurement of materials, manufacturing of equipment, factory test and shipment of equipment.

and

Renumber the existing contents as b), c), d), e), f), and g).

## **Volume 1 Particular Conditions of Contract Sub-Clause 12.4 (A) (i)**

*The existing texts of has been deleted in its entirety and replaced by the following texts:*

If, based on the results of the field acceptance tests, the Contractor fails to achieve the Guaranteed Weighted Average Efficiency with due consideration for the tolerance allowed for measuring, then he shall be bound to modify the turbine design in order to attain the guaranteed value.

If the guaranteed value cannot be achieved by means of modifications, the Contractor shall pay the penalty. The applicable penalty shall be for each 0.10% less efficiency from the guaranteed values an amount of USD 130,000.00 (In words: United States Dollar One Hundred and Thirty Thousand only) shall be paid for each turbine. This penalty shall be applicable up to 1% (one percent) less than the guaranteed value of efficiency. If the efficiency is less than weighted average efficiency of 92%, the turbine shall be rejected.

No bonus will be given for exceeding the guaranteed values.

## **5 Changes to the Volume 3 Part 1 General Technical Specification**

### **Section 10 sub-section 10.1 GENERAL SITE INFRASTRUCTURE**

*Delete the existing texts of this sub-section 10.1 and replace with the following:*

The Lot 1 (Civil Works and Hydromechanical Works) Contractor is responsible for providing the adequate uncovered and covered (without furnishing and without air conditioning) storage area, office facilities (without furnishing and without air conditioning), personnel accommodations (of a

European standard for not more than 20 persons without furnishing and without air conditioning) during the construction, erection, testing and commissioning of the electromechanical equipment.

Lot 2 Contractor shall provide accommodation facilities for his local staffs.

### Section 10 sub-section 10.6 MEDICAL FACILITIES

*Delete the existing texts of this sub-section 10.6 and replace with the following:*

The Lot 1 Contractor shall provide access to all the medical facilities such as Site Clinic, First Aid stations, ambulance for emergency cases and medical treatment for the Lot 2 Contractor's site employees and members of their families' resident on the Site.

Lot 1 Contractor shall provide medical staffs and helicopter transport service for emergency rescue cases requiring medical treatment in Kathmandu, Nepal.

All of the medical facilities to be provided by the Lot1 Contractor shall be made available free of charge to the Lot 2 Contractor's site employees and members of their families resident on the Site.

### Section 11 INTERFACE DETAILS

#### Design/ Construction Interface Management Plan

*Add the sentence at the end of a) "The bidder shall submit with his Bid the layout plan arrangement drawing of powerhouse to the scale to accommodate his equipment, which shall be the basis for design of the powerhouse by Lot 1 Contractor".*

## 6 Changes to Volume 3: Part 2

### TECHNICAL SPECIFICATIONS. MECHANICAL EQUIPMENT

*The following changes shall be made to the Volume 3 – Part 2:*

Item	Old Texts	New texts
<b>CHAPTER 01:</b> <b>HYDRAULIC TURBINES</b> 1.1.2.1 Design of Generating Units, Page 2	The specified rated output of each unit shall be available when running all three units together, with total 105 MW power at rated net head, rated discharge per unit and at rated speed or two units in similar conditions with 68 MW output or single unit under rated head, rated discharge and rated speed with rated output 34 MW.	The specified rated output of each unit shall be available when running all three units together, with total 105 MW power at rated net head, rated discharge per unit and at rated speed or two units in similar conditions with 70 MW output or single unit under rated head, rated discharge and rated speed with rated output 35 MW.
B. Operating Condition a) Water levels and heads, Page 4	Tail water level function is: $z = 0.00041 \times Q^2 + 0.0401 \times Q + 916.25$	Tail water level function is: $z = 0.00041 \times Q^2 + 0.0401 \times Q + 916.00$

B. Operating Condition a) Water levels and heads, Page 4	<ul style="list-style-type: none"> <li>Minimum (three units operation at 110%) :220.38m</li> </ul>	<ul style="list-style-type: none"> <li>Minimum (three units operation at 100%) :220.38m</li> </ul>
B. Operating Condition b) Turbine capacity and efficiency, Page 5	The prototype capacity and efficiency shall be derived from values measured on a laboratory scale fully homologous model for comparable Francis turbine designed for similar hydraulic conditions.	The prototype capacity and efficiencies shall be derived from existing Bidder model tests for comparable Francis turbines designed for similar hydraulic conditions.
1.1.6 Guarantees 1.1.6.1 Operating Head Range, Page 10	Satisfactory operation of the turbines without total or partial damage or excessive cavitation or vibration under any operating conditions within a net head range shall be guaranteed.	Satisfactory operation of the turbines without total or partial damage or excessive cavitation or vibration under operating conditions from full load to partial load of 40% of full load within the net head range from 220.38m to 234.79m shall be guaranteed.
1.1.6.3 Turbine efficiency, Page 11	The guaranteed weighted average efficiency shall not be less than 93%.	The guaranteed weighted average efficiency shall not be less than 92%.
<b>CHAPTER 04. COOLING WATER SYSTEM</b> 4.1 General, Page 1	Further cooling water shall be supplied to the chillers units of the HVAC System specified in a separate package of the Tender Documents.	This paragraph is deleted.
	The primary circuits shall transfer raw water through intermediate heat exchangers while the secondary circuit shall circulate clean water through the coolers of the generating units and the HVAC system, and transfer heat losses through the intermediate heat exchangers to the raw water flow.	The primary circuits shall transfer raw water through intermediate heat exchangers while the secondary circuit shall circulate clean water through the coolers of the generating units, and transfer heat losses through the intermediate heat exchangers to the raw water flow.
4.3 Limits of supply, Page 3	(4) With the HVAC System	Item (4) is suppressed.
<b>CHAPTER 02: GOVERNOR SYSTEM</b> Clause 2.2.5, Page 18 of 28	Governor Local Control Panel: The front side of each governor actuator shall have the function of the local control panel. It shall be equipped with the necessary components (protection class IP 65) for local operation of the pressure	...manual control of the turbine. In the case of the Governor Electronic Control Board the enclosure of the same shall be protection class IP 44.

## 7 Changes to Volume 3: Part 3

### TECHNICAL SPECIFICATIONS. ELECTRICAL EQUIPMENT

The following changes shall be made to the Volume 3 – Part 3:

Item	Old texts	New texts
<b>CHAPTER 01: GENERATOR</b> Clause 1.2.4, Page 4 of 32	Temperature Rise Limits: Stator 80 K	Stator 80 K (temperature rise limit as class B)
<b>CHAPTER 01: GENERATOR</b> Clause 1.2.5, Page 4 of 32	Short Circuit Withstand Capability: The generator shall be capable of withstanding a three phase short circuit at the generator terminals when operating at rated output and power factor at 105% rated voltage during 1 hour.	The generator shall be capable of withstanding a three phase short circuit at the generator terminals when operating at rated output and power factor at 105% rated voltage during 3 sec.
<b>CHAPTER 01: GENERATOR</b> Clause 1.2.7, Page 5 of 32	Stability and performance: The generators shall be capable of operating continuously on an unbalanced system with none of the phase currents exceeding the rated current and under fault conditions with the product of $(I2/I_n)^2$ and the time(t) in seconds not exceeding 40°C.	The generators shall be capable of operating continuously on an unbalanced system with none of the phase currents exceeding the rated current and under fault conditions with the product of $(I2/I_n)^2$ and the time(t) in seconds not exceeding 20 sec.
<b>CHAPTER 01: GENERATOR</b> Clause 1.2.8, Page 5 of 32	Top Cover: (5) Both the upper and lower cover shall be strong enough to support the weight of men working and the upper cover shall be capable of carrying the additional weight of minor generator components during erection or dismantling. The minimum live load shall be 5 kN/m <sup>2</sup> .	(5) Point is deleted
<b>CHAPTER 01: GENERATOR</b> Clause 1.10.4, Page 32 of 32	Type Tests for One Generator: (16) Short circuit withstand test;	(16) Point is deleted (Short circuit test will not be conducted)
<b>CHAPTER 03: GENERATOR MAIN CIRCUIT 11 kV</b> Clause 3.2.2, Page 1 & 2 of 16	Main Characteristics: (1) General: Nominal system voltage:-11kV Rated voltage:-17.5kV. Power frequency withstands voltage:-38kVrms. Lighting withstand impulse voltage :-95kVpeak.	(1) General (as IEC) Nominal system voltage:-11kV Rated voltage:-17.5kV. Power frequency withstands voltage:-38kVrms. Lighting withstands impulse voltage: -95kVpeak.



<p><b>CHAPTER 03: GENERATOR MAIN CIRCUIT 11 kV</b> Clause 3.2.2, Page 2 of 16</p>	<p>Main Characteristics: Protection class ..... IP 65</p>	<p>Protection class ..... IP 55</p>
<p><b>CHAPTER 03: GENERATOR MAIN CIRCUIT 11 kV</b> Clause 3.2.3, Page 3 of 16</p>	<p>Particular Design and Construction Requirements: (11) To avoid the ingress of dust and humidity and to preserve the dielectric strength of the insulating air a pressure of approx. 0.5 to 2 kPa shall be maintained in the busduct enclosures...</p>	<p>(11) Point is deleted</p>
<p><b>CHAPTER 03: GENERATOR MAIN CIRCUIT 11 kV</b> Clause 3.3.2, Page 5 of 16</p>	<p>Main Characteristics: Rated short time withstand current (3s) .... 31.5 kA</p>	<p>Rated short time withstand current (3s) .... 31.5 kA</p>
<p><b>CHAPTER 03: GENERATOR MAIN CIRCUIT 11 kV</b> Clause 3.3.3, Page 7 of 16</p>	<p>Main Characteristics: The duty cycle shall be O - 0.3 s - CO - 15 s - CO.</p>	<p>The duty cycle shall be O - 0.3 s - CO - 3 min - CO.</p>
<p><b>CHAPTER 03: GENERATOR MAIN CIRCUIT 11 kV</b> Clause 3.6.1, Page 13 &amp; 14 of 16</p>	<p>Bus Ducts Systems - Type Tests: Type tests : The following type tests shall have been performed and recorded. The relevant TT certificates shall be submitted. - Power frequency voltage withstand test; - Lightning impulse voltage withstand test; - Measurement of conductor/enclosure temperatures at rated current; - Test of thermal and electro-dynamic stability; - Determination of total losses.</p>	<p>Type tests : The following type tests shall have been performed and recorded. Contractor can submit the relevant TT certificates of same kind of equipment. - Power frequency voltage withstand test; - Lightning impulse voltage withstand test; - Measurement of conductor/enclosure temperatures at rated current; - Test of thermal and electro-dynamic stability; - Determination of total losses.</p>
<p><b>CHAPTER 04: MAIN TRANSFORMER</b> Clause 4.2.1. Page 2 of 37</p>	<p>Main Characteristics: Neutral terminal - Highest voltage (Um) for Equipment kVrms 123 - Lightning impulse (LI) withstand voltage kVpeak 550 - (AC) Short duration induced and separate source AC withstand voltage for line terminal kVrms 230</p>	<p>Neutral terminal - Highest voltage (Um) for Equipment kVrms 123 - (AC) Short duration induced and separate source AC withstand voltage kVrms 38</p>
<p><b>CHAPTER 04: MAIN TRANSFORMER</b> Clause 4.7. Page 28 of 37</p>	<p>Workshop Tests: Factory Test ( Routine Tests): Measurement of no-load losses and current from 90 % to minimum 120 % of rated voltage and/or vice versa in 5 % intervals, at rated frequency (after dielectric tests). The highest test.voltage of 120 % shall be held at this level for at least 15 min.A respective magnetising.curve current from 90 % to approx. 125 % shall be</p>	<p>Factory Test ( Routine Tests): Measurement of no-load losses and current from 90 % to minimum 110 % of rated voltage and/or vice versa in 5 % intervals, at rated frequency (after dielectric tests).</p>



	added to the test report.	
<b>CHAPTER 04: MAIN TRANSFORMER</b> Clause 4.7. Page 28 of 37	Workshop Tests: Switching impulse test for HV windings of Um = 245 kV and above (before lightning impulse tests).	This paragraph is deleted
<b>CHAPTER 04: MAIN TRANSFORMER</b> Clause 4.7. Page 28 of 37	Workshop Tests: Calibration and current injection test on hot spot indicators based on results of heat run test	This paragraph is deleted
<b>CHAPTER 04: MAIN TRANSFORMER</b> Clause 4.7. Page 31 of 37	Workshop Tests: Tests of Transformer Tank and Accessories :Vacuum test on tank and all other oil-filled compartments (to be applied at 1.5 mbar for at least 5 hours)	Tests of Transformer Tank and Accessories :Vacuum test on tank and all other oil-filled compartments (to be applied at 1.5 mbar for at least 2 hours)
<b>CHAPTER 05: 220 kV GIS</b> Clause 5.3.2. & 5.5.2 Page 3 & 9 of 35	Main Characteristics & CBs Main Characteristics: Rated switching impulse withstand voltage kV peak 850	The paragraph is deleted
<b>CHAPTER 05: 220 kV GIS</b> Clause 5.5.3. Page 27 of 35	Workshop Tests: Routine Production Test: Pressure tests of enclosures as per clause 7.102 of IEC 517	Routine Production Test: Pressure tests of enclosures as per clause 7.102 of IEC 517. Pressure Test shall be performed on all enclosures after fabrication.
<b>CHAPTER 07: 220 kV AIS TO SWY</b> Clause 7.3.3. Page 8 of 20	Surge Arresters: Rated power frequency withstand voltage:656kV	Rated power frequency withstand voltage for surge arrestor housing:656kV
<b>CHAPTER 10: STATION SERVICE &amp; ISOLATION TRANSFORMERS</b> Clause 10.2.1. Page 2 to 4 of 18	Main Characteristics: Impulse withstand voltages: Power frequency 38kV Lightning 95kV	Impulse withstand voltages (considering Um=17.5 kV): Power frequency 38kV Lightning 95kV
<b>CHAPTER 10: STATION SERVICE</b>	Workshop Tests: 1) Routine Tests : Measurement of no-load	1) Routine Tests : Measurement of no-load losses from 90 % to 110 % in 5 % intervals on

<p><b>&amp; ISOLATION TRANSFORMERS</b>                  Clause 10.6. Page 14-16 of 18</p>	<p>losses from 90 % to 115 % in 5 % intervals on distribution transformers (at rated frequency)</p>	<p>distribution transformers (at rated frequency)</p>
<p><b>CHAPTER 10: STATION SERVICE &amp; ISOLATION TRANSFORMERS</b>                  Clause 10.6. Page 15-16 of 18</p>	<p>Workshop Tests:                  Measurement of no-load losses and current from 90 % to 120 % of rated voltage or vice versa in 5 % intervals, at rated frequency on earthing transformers (after dielectric tests).The highest test voltage of 120 % shall be held at this level for at least two minutes. A respective magnetising curve current from 90 % to 120 % shall be added to the test report.</p>	<p>Measurement of no-load losses and current from 90 % to 110 % of rated voltage or vice versa in 5 % intervals, at rated frequency on earthing transformers (after dielectric tests).The highest test voltage of 120 % shall be held at this level for at least two minutes. A respective magnetising curve current from 90 % to 120 % shall be added to the test report.</p>
<p><b>CHAPTER 10: STATION SERVICE &amp; ISOLATION TRANSFORMERS</b>                  Clause 10.6. Page 15-16 of 18</p>	<p>Workshop Tests:                  (2) Type Tests &amp; (3) Special Tests</p>	<p>(2) Type Tests &amp; (3) Special Tests Type test certificates (when available) can be accepted to be provided.</p>
<p><b>CHAPTER 14: 11 kV OH LINES</b>                  Clause 14.1- Point (2). Page 1 of 30</p>	<p>Scope of Works:                  the Camp.</p>	<p>the Camp (at a distance of approx. 0.5 km).</p>
<p><b>CHAPTER 14: 11 kV OH LINES</b>                  Clause 14.5.1. Page 6 of 30</p>	<p>Workshop Tests:                  WORKSHOP TESTS: Surge Arresters Temperature cycle test on porcelain housing. Porosity test on porcelain components.</p>	<p>WORKSHOP TESTS: Surge Arresters Temperature cycle test on porcelain housing. Porosity test on porcelain components. Wherever Type test has been mentioned, only type test certificates shall be provided.</p>
<p><b>CHAPTER 14: 11 kV OH LINES</b>                  Clause 14.5.2. Page 17 of 30</p>	<p>Workshop Tests:                  (d) Deflection test &amp; Permanent set test by applying the 1.2 times the maximum permissible load.</p>	<p>(d) Deflection test &amp; Permanent set test by applying the 1.2 times the maximum permissible load. The test shall be performed as per applicable standard.</p>
<p><b>CHAPTER 14: 11 kV OH LINES</b>                  Clause 14.5.2. Page 17 of 30</p>	<p>Workshop Tests:                  Lot Size Nos. of Poles for Dimension Check No. of Poles for Assembly &amp; Other Tests</p>	<p>Lot Size Nos. of Poles for Dimension Check No. of Poles for Assembly &amp; Other Tests Sampling shall be done as per applicable standard or IS:2500 AQL2.5</p>
<p><b>CHAPTER 15: ELECTRICAL PROTECTIONS</b>                  Clause 15.4.30. Page 28 of 33</p>	<p>Description of Protection Devices</p>	<p>The following text shall be added to the Specs:                  Directional Overcurrent Protection ( ) Three-phase low-set overcurrent stage with definite-time or inverse definite mini- mum time (IDMT) characteristic.                  • Three-phase high-set overcurrent stage with instantaneous or definite-time characteristic                  • Phase discontinuity protection                  • Low-set non-directional earth-fault stage with definite-time or IDMT characteristic</p>

		<ul style="list-style-type: none"> <li>• High-set non-directional earth-fault stage with instantaneous or definite-time characteristic</li> <li>• Circuit-breaker failure protection (CBFP)</li> <li>• Disturbance recorder:                         <ul style="list-style-type: none"> <li>- recording time up to 10 seconds</li> <li>- triggering by a start or a trip signal from any protection stage and/or by a binary input signal</li> <li>- records four analogue channels and up to eight user-selectable digital channels</li> <li>- adjustable sampling rate</li> </ul> </li> <li>• Non-volatile memory for                         <ul style="list-style-type: none"> <li>- up to 60 event codes</li> <li>- setting values</li> <li>- disturbance recorder data</li> <li>- recorded data of the five last events with time stamp</li> <li>- number of starts for each stage</li> <li>- alarm indication messages and LEDs</li> </ul> </li> <li>• Display of primary current values</li> <li>• Demand values</li> <li>• Multi-language support</li> </ul>
<p><b>CHAPTER 20: MV &amp; LV CABLE SYSTEM</b> Clause 20.1. Page 1 of 11</p>	<p>Scope of Works:                  Power and control cable systems shall be provided for the entire hydropower plant including the irrigation outlets.</p>	<p>Power and control cable systems shall be provided for the entire hydropower plant including the Weir Service Building and Emergency Valve Chamber.</p>

## 8 Changes to the Volume 5 Tender Drawings

Electronic AutoCAD copies of the updated Tender Drawings are enclosed in Appendix 1 enclosed with this Addendum No. 1.

## Appendix 1

### Electronic AutoCAD Copies of Drawings

## Appendix 2

### New Updated Drawings

## Appendix 3

### Electronic Copies of the Schedule of Prices and Technical Data Sheets