

ADDENDUM NO. 04

Amendments to RFP/EPC Bidding Document for Engineering, Procurement and Construction (EPC) of Attabad Lake Hydropower Project (54 MW) Package-III: Electro-Mechanical Works

This Addendum No. 04 to RFP/EPC Bidding Document containing the following amendments to the RFP/EPC Bidding Document for Engineering, Procurement and Construction (EPC) of Attabad Lake Hydropower Project (54 MW) Package-III: Electro-Mechanical Works is issued pursuant to ITP 8.1 of Volume-I of RFP/EPC Bidding Document.

Volume I, Section II - Proposal Data Sheet (PDS), ITP 23.1 (Deadline for Submission of Proposals)		
ITP No.	Instruction to Proposer	Amendment
ITP 23.1	The Proposal/Bids shall be submitted/uploaded on EPADS v2.0 at https://vendors.epads.gov.pk/ Proposal/Bids not submitted/uploaded on EPADS v2.0 shall not be accepted. For Proposal Submission Purposes (Original Bid Security) only, the Employer's address is: Water and Power Development Authority (WAPDA), WAPDA Auditorium, WAPDA House, Sharah-e-Quaid-e-Azam Lahore, Punjab, Pakistan Telephone: 0092-42-99204981 0092-42-3334481116 Electronic Mail Address: gmpna01@gmail.com, pdalhpp@gmail.com Date: August 05, 2026 Time: 1100 hrs.	The Proposal/Bids shall be submitted/uploaded on EPADS v2.0 at https://vendors.epads.gov.pk/ Proposal/Bids not submitted on EPADS v2.0 shall not be accepted. For Proposal Submission Purposes (Technical Part and Original Proposal Security) only, the Employer's address is: Water and Power Development Authority (WAPDA), WAPDA Auditorium, WAPDA House, Sharah-e-Quaid-e-Azam Lahore, Punjab, Pakistan Telephone: 0092-42-99204981 0092-42-3334481116 Electronic Mail Address: gmpna01@gmail.com, pdalhpp@gmail.com Date: August 20, 2026 Time: 1100 hrs.

Volume I, Section II - Proposal Data Sheet (PDS), ITP 26.1 (Opening of Technical Parts of Proposal)		
ITP 26.1	The Electronic Bids/Proposal Opening on EPADS v2.0 shall take place on: Date: August 05, 2026 Time: 1130 hrs. Venue: WAPDA Auditorium, WAPDA House, Sharah-e-Quaid-e-Azam Lahore, Punjab, Pakistan	The Electronic Bids/Proposal Opening on EPADS v2.0 shall take place on: Date: August 20, 2026 Time: 1130 hrs. Venue: WAPDA Auditorium, WAPDA House, Sharah-e-Quaid-e-Azam Lahore, Punjab, Pakistan

Volume I, Part-I, SECTION-IV PROPOSAL FORMS, Appendix to Proposal, Specified Provisional Sum

The referred form has been updated accordingly and is enclosed as **Annexure-A**.

Volume II, Part-II, Technical Provisions, Section 1, Hydro-Mechanical Equipment, Sub-Clause Tools 1.1.17.9 Additional Requirements for Abrasion Protection of Turbine Water Passage Components Against Sediment Erosion and 1.1.17.10 Coating Requirements for Spare Parts of Turbine Water Passage Components

The following Sub-Clause 1.1.17.9, Sub-Clause 1.1.17.10 and Sub-Clause 1.1.17.11 have been added after Sub-Clause 1.1.17.8 Wearing Wings. The referred Sub-Clauses have been attached as **Annexure-B**.

Other terms and conditions of the RFP/EPC Bidding Document shall remain unchanged.

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Annexure-A

Specified Provisional Sums

Item No.	Description	Amount (Million PKR)
1.	Protection of the Environment GC Sub-Clause 4.18	20.00
2.	Health and Safety GC Sub-Clause 4.8	
3.	Security Arrangements GC Sub Clause 4.21	10.00
4.	Provisional Sums for the Employer's portion of DAAB costs	15.00
5.	Adjustment for Change in Legislation, Royalties and Custom Duties GC Sub-Clause 13.6	20.00
Total for Specified Provisional Sums (carried forward to Grand Summary (C), p. _____)		65.00

Annexure-B

1.1.17.9 Additional Requirements for Abrasion Protection of Turbine Water Passage Components Against Sediment Erosion

During the tendering stage, additional information regarding the sediment characteristics of the Attabad Lake Hydropower Project (54MW) has become available. The Employer has observed that the Attabad Lake water carries significant quantum of abrasive sediment during high-flow period, which may result in accelerated wear of the hydraulic passages of the turbine, if appropriate protection measures are not incorporated into the design by the EPC Contractor.

Any sediment information supplied is for reference only and shall not relieve the EPC Contractor from carrying out its own assessment of sediment characteristics, erosion mechanisms and protective measures.

As per Sub-Clause 1.1.3 of Technical Provisions, Part-II, Volume-II, of the RFP/EPC Bidding Document, the EPC Contractor shall independently assess the sediment conditions and shall be solely responsible for selecting appropriate materials, coatings, and protective measures necessary to satisfy the guaranteed performance, efficiency, reliability, availability, and service life requirements specified in the RFP/EPC Bidding Document. No additional payment or claim shall be entertained on account of sediment-induced erosion that could reasonably have been addressed through proper design and material selection.

Accordingly, the following requirements shall form part of the Employer's Requirements and shall be considered by all Proposers in the preparation of their Technical and Financial Proposals.

1.1.17.9.1 General

The EPC Contractor shall design, manufacture, and supply Vertical Shaft Francis turbines suitable for continuous operation under sediment-laden water conditions prevailing at the Attabad Lake Hydropower Project (54 MW).

The turbine design shall incorporate suitable erosion-resistant measures to minimize abrasive wear, maintain hydraulic efficiency throughout the service life, and reduce maintenance frequency.

The Proposer shall include all costs associated with such protection in the Proposal Price.

1.1.17.9.2 Hard Coating Requirements

The EPC Contractor shall provide a proven abrasion-resistant protection system suitable for severe hydro-abrasive service. The proposed coating system shall be fully compatible with CA6NM stainless steel and shall not adversely affect the metallurgical, mechanical, or hydraulic performance of the base material. The Proposer shall substantiate such compatibility by submitting documentary evidence, including manufacturer's technical data, material specifications, test reports, and/or documented references demonstrating successful application on CA6NM stainless steel under comparable service conditions, for the Employer's review.

High Velocity Oxygen Fuel (HVOF)-applied Tungsten Carbide (WC-Co, WC-CoCr) is the preferred solution.

High Velocity Oxygen Fuel (HVOF) is a thermal spray technology in which powder is fed into a spray gun. A fuel gas (such as propane) is combusted with oxygen to generate a high-

temperature, high-velocity gas stream. The powder particles are heated and accelerated to supersonic velocity before impacting the substrate to form a dense, strongly adherent coating.

1.1.17.9.3 Coating Test Method

The coating system shall be tested and qualified in accordance with IEC 62364, Hydraulic Machines – Guide for Dealing with Hydro-Abrasive Erosion in Kaplan, Francis, and Pelton Turbines.

The EPC Contractor shall apply the protective coating to the turbine runner, guide vanes, facing plates, wearing rings and any other turbine water passage components identified as susceptible to hydro-abrasive erosion, in order to extend the service life of turbine runners and associated components.

After application of the coating, the coated components, including the runner and guide vanes, shall be inspected during each annual maintenance outage. Where necessary, localized repairs shall be carried out at site in accordance with the coating manufacturer's approved repair procedures.

The EPC Contractor shall state and guarantee the expected service life of the coating system under the specified sediment conditions and shall specify the expected inspection intervals, maintenance requirements, repair methodology, and recoating intervals throughout the design service life of the turbine.

1.1.17.9.4 Minimum Coating Locations

The EPC Contractor shall identify all erosion-prone surfaces through hydraulic analysis, sediment erosion assessment, and operating experience and provide suitable protection. As a minimum, the following locations shall be considered:

- Turbine Runner blades
 - o Leading edge
 - o Pressure side
 - o Suction side
 - o Trailing edge
 - o Crown transition
 - o Band transition
 - o Runner outlet region
- Turbine Guide Vanes
 - o Leading edges
 - o Trailing edges
 - o Upper and lower sealing faces
 - o Side faces exposed to leakage flow
- Turbine Facing Plates
- Turbine Wearing Rings
- Turbine Labyrinth Rings

- Stay Vanes (where considered susceptible to hydro-abrasive erosion)
- Other underwater metallic components identified by the EPC Contractor as susceptible to abrasive erosion.

1.1.17.9.5 Coating Material and Thickness

The coating shall consist of a Tungsten Carbide based material suitable for severe hydro-abrasive service.

Typical acceptable systems include:

Parameters	Specifications
Coating Material	WC
Type	(WC-Co, WC-CoCr)
Composition	Tungsten carbide (WC) 86%, Cobalt 10%, Chrome 4%
Porosity Rate of Coating	< 1%
Bonding Strength of Coating	To be provided by the EPC Contractor and Supported by Test Certificates
Thickness	To be provided by the EPC Contractor
Hardness of Coating	To be provided by the EPC Contractor
-The coating surface roughness after spraying: To be provided by the EPC Contractor	

The EPC Contractor shall determine coating thickness based on its own assessment of sediment characteristics, including sediment concentration, particle hardness, particle size distribution, operating head, flow velocity and expected service life etc.

The proposed coating thickness shall be justified through design calculations, coating manufacturer's recommendations, laboratory test results (where available), and documented successful operating references and shall be subject to the Employer's review.

1.1.17.9.6 Design Responsibility

The EPC Contractor shall ensure that:

- Coating application shall not adversely affect hydraulic efficiency;
- Coating shall not alter designed hydraulic profiles;
- Coating shall remain intact throughout the guaranteed operating period
- Coating repairs, if required, can be carried out using standard maintenance procedures. There are typical criteria to determine overhaul time due to abrasion erosion in the IEC 62364 standard will be followed.

The EPC Contractor shall also specify the minimum remaining coating thickness requiring repair or recoating.

1.1.17.9.7 Technical Requirements/ submittals by EPC Contractor

The EPC Contractor shall submit the following for the Employer's review:

- Method Statement for coating application
- Surface Preparation procedure
- Surface Roughness Measurement procedure
- Coating Material Specification
- Coating Chemical composition

- Hardness test reports
- Bond Strength test reports
- Porosity test reports
- Coating Thickness measurements
- Erosion Resistance test results
- Cavitation Resistance test results
- Quality Control procedure
- Coating Inspection and Acceptance procedure
- Repair procedure for damaged coating
- Quality Certificates from the coating Manufacturer

All coating parameters shall comply with internationally recognized standards.

1.1.17.9.8 Technical Requirements/ submittals by EPC Contractor

The EPC Contractor shall be fully responsible for achieving the guaranteed turbine efficiency, reliability, availability, abrasion resistance, and service life under the actual sediment conditions encountered at the Project.

The selection of coating material, coating thickness, application process, coating quality and protected areas shall remain entirely the EPC Contractor's responsibility.

Any abnormal coating failure, delamination, excessive erosion, or loss of hydraulic performance during the Defects Notification Period attributable to inadequate coating design, material selection, application process, Quality Control or workmanship shall be rectified by the EPC Contractor at no additional cost to the Employer.

The EPC Contractor shall also guarantee that the coating system shall not crack, peel, blister, or delaminate under normal operating conditions during the Defects Notification Period.

1.1.17.10 Coating Requirements for Spare Parts of Turbine Water Passage Components

As per Sub-Clause 1.1.20.2, Mandatory Spare Parts, Technical Provisions, Part-II, Volume-II of RFP/EPC Bidding Document. The EPC Contractor shall ensure that all spare parts supplied under the Contract for the hydraulic water passage components are provided with the same erosion-resistant coating system as the corresponding installed components.

The coating material, application process, coating thickness, Quality Control requirements, inspection requirements and acceptance criteria for the spare parts shall be identical to those applied to the permanent Works parts.

The requirement shall include, but not be limited to, spare parts for the following components but not limited to,

- Turbine Runner
- Turbine Guide Vanes
- Turbine Facing Plates
- Turbine Wearing Rings
- Turbine Labyrinth Rings

- Other coated hydraulic components supplied as recommended or mandatory spare parts.

The EPC Contractor shall adequately protect the coated spare parts during manufacturing, transportation, handling, and storage to prevent mechanical damage, corrosion, contamination, or deterioration of the coating prior to installation.

No additional payment shall be made for coating of spare parts to the EPC Contractor, and all associated costs shall be deemed to be included in the Proposal Price.

The EPC Contractor shall provide appropriate protective packing and handling procedures to ensure that the coating integrity of spare parts is maintained throughout storage till installation.

1.1.17.11 Alternative Coating System – Submission, Evaluation and Approval Requirements

The Employer/Employer's Representatives may consider an alternative coating system proposed by the EPC Contractor, subject to the completion of a detailed sedimentation study and assessment of the actual sediment characteristics and operating conditions at the Project. Such alternative coating shall only be considered subject to the EPC Contractor demonstrating, through adequate technical documentation and satisfactory test results, that the proposed alternative provides performance equivalent to or superior to that of the specified hard coating system.

Any such alternative proposal shall be submitted for the Employer review and approval prior to its implementation and shall, as a minimum, include complete technical details of the proposed coating system, manufacturer's technical data, applicable standards and test procedures, coating thickness, surface preparation requirements, adhesion/bond strength, hardness, abrasion and erosion resistance, chemical and environmental resistance, expected service life, application procedure, quality control requirements, inspection and testing records, and relevant references demonstrating successful application under comparable hydropower operating conditions

The EPC Contractor shall also provide documented evidence from the coating manufacturer and/or an independent accredited testing laboratory confirming the suitability and performance of the proposed alternative under sediment-laden water conditions representative of the Project. Where considered necessary, the Employer may require additional laboratory testing, qualification testing, or verification of the proposed coating system prior to granting approval.

It is emphasized that acceptance of an alternative coating system shall be subject to the Employer satisfaction that the proposed solution does not compromise the durability, reliability, hydraulic performance, maintainability, or intended service life of the equipment. The EPC Contractor shall remain fully responsible for demonstrating the technical equivalence or superiority of the proposed alternative and for ensuring its compatibility with the base material and the operating conditions of the equipment.