Owner's Engineer for Rehabilitation of Litani River Authority's Hydropower Plants

Terms of Reference

I. Introduction

On October 1, 2024, the World Bank approved the US$250 million IBRD financing for the Lebanon's Renewable Energy and Systems Reinforcement Project (RESRP - P180501). Sub-component 2.2 of RESRP (P180501), at a total estimated cost of US$25 million, will be financing the rehabilitation of Litani River Authority (LRA)'s Hydro Power Plants (HPPs) (hereinafter referred to as "the Project"). The LRA (the Client) will be procuring the services of an Owner's Engineer (OE) to help with various aspects of the Project.

The Litani River is the longest river in Lebanon, with length of 170 km, and a discharge capacity of some 750 million cubic meters per annum. The river rises at an altitude of 1000 m asl in the Bekaa valley in the north-east of the country, and flows southwards then west, entering the Mediterranean Sea some 8 km north of Tyre. The water resources of the Litani River are managed by the Litani River Authority (LRA) under the Ministry of Energy and Water, which is responsible for electricity generation, municipal and irrigation supplies and preservation of water quality, and for monitoring and controlling abstractions. The infrastructure on the Litani River owned and operated by LRA includes the Qaraoun Dam and a cascade of three downstream hydropower plants: Markabi, Awali and Joun HEPs, with an aggregate installed capacity of 192 MW. The key characteristics of these plants are as follows:

Qaraoun Dam

Date of completion:	1964
Type:	Concrete faced rockfill
Height:	61 metres
Crest length:	1090 m
Gross storage:	220 million m³
Active storage:	170 million m³
Dead storage:	50 million m³
Full supply level:	858 m asl
Minimum operating level:	820 m asl

Markabi HEP (also known as Ibrahim Abdel Al HPP)

Date of Commissioning:	1962
Install Capacity:	36 MW
Number of Units:	2 no. vertical Francis units
T-G Unit capacity:	18 MW each
Original manufacture:	Andritz Hydro
Gross head:	199 m
Tunnel length:	6.4 km
Headwater level:	858 m asl
Tailwater level:	659 m asl

Awali HEP (also known as Paul Arcashe HPP)

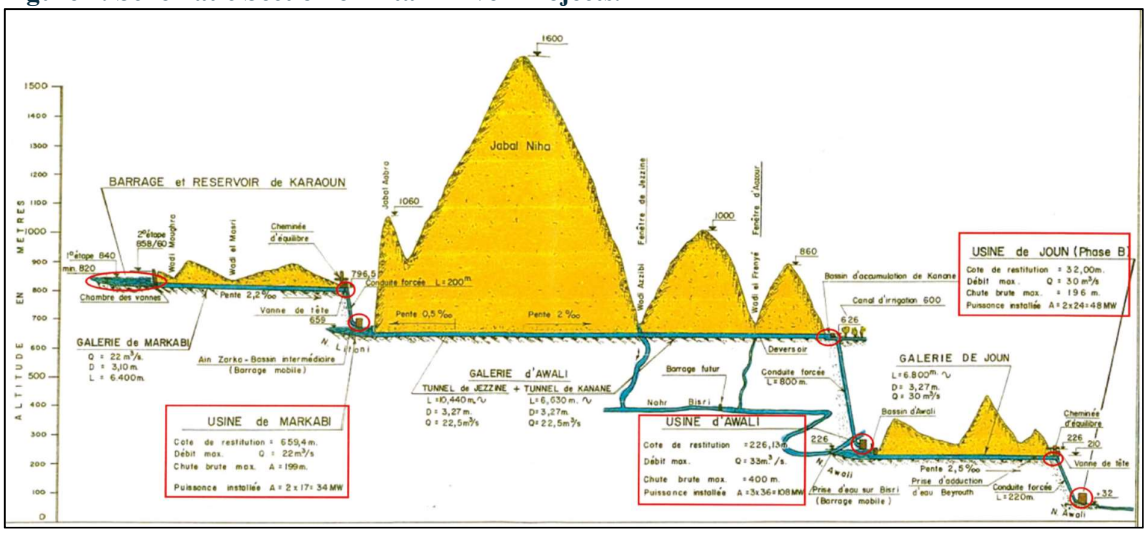
Date of Commissioning:	1965
Install Capacity:	108 MW

Number of Units:	3 no. 5-jet vertical Pelton units
T-G Unit capacity:	36 MW each
Original manufacture:	GE Vernova (Turbines) and Siemens (Generators)
Gross head:	400 m
Tunnel length:	17.0 km
Headwater level:	626 m asl
Tailwater level:	226 m asl

Joun HEP (also known as Charles Helou HPP)

Date of Commissioning:	1968
Install Capacity:	48 MW
Number of Units:	2 no. horizontal Francis units
T-G Unit capacity:	24 MW each
Original manufacture:	Voith-Siemens Hydro
Gross head:	196 m
Tunnel length:	6.8 km
Headwater level:	226 m asl
Tailwater level:	32 m asl

Figure 1: Schematic Section of Litani River Projects.



Previous Work and Studies

A range of refurbishment wok has been undertaken on the mechanical and electrical components of the three hydroelectric plants according to the Litani River Authority as follows:

Markabi HPP work undertaken:

- Replacement of the two turbine governors in 1995 together with actuators
- Replacement of stators and rehabilitation of rotors (Unit 1 in 2014, Unit 2 in 2018)
- Replacement of alternator excitation systems with voltage regulators (Unit 1 in 2017, Unit 2 in 2018)
- Replacement of protection systems for alternators (Unit 1 in 2022, Unit 2 in 2022)
- Installation of new SCADA system for operation of the power plant (2000).
- Replacement of power transforms 24 MVA each (Unit 1 in 2018, Unit 2 in 2018)

Awali HPP work undertaken:

- Replacement of the turbine governors (with actuators) for three turbines in 1995
- Replacement of three voltage regulators for alternators (1995)
- Replacement of power transformer 45 MVA (Unit 3 in 2016)

Joun HPP work undertaken:

- Replacement of two turbine governors with actuators (1995)
- Replacement of two turbines (runner, wicket gates, right and left covers for Unit 1 in 2012 and for Unit 2 in 2016)
- Replacement of alternator excitation systems, synchronization systems, and protection systems for alternators (2014)
- Installation of a new SCADA system for the power plant and replacement of protection systems for three 66 kV transmission lines (2016)
- Replacement of power transformer 30 MVA (Unit 2 in 2010)

In 2024, with the support of the World Bank, the following studies for LRA with other studies for EDL were completed to inform the design of the World Bank financed US$250 million Lebanon Renewable Energy and System Reinforcement Project (P180501):

-Due Diligence on Rehabilitation Needs of LRA Hydropower Projects (Sep. 2024),

-Tier 1[1] Safety Assessment of Qaraoun Dam (Jul. 2024)

-Tier 1 Safety Assessment of Anan and Awali Dams (Aug. 2024).

Those studies completed by the Client (LRA) are hereinafter referred to as "Preparatory Studies". The full list, including relevant environmental and social documents, is presented in Annex 1 and those will be provided to short-listed consultants.

II. Objective of the Assignment

The OE will act as the project management consultant and will carry out the following main activities required for the Project.

- Preparing all bidding Documents (BDs) for the rehabilitation of the three power plants with all technical definition and design, and preparation of detailed technical specifications and necessary drawings, as well as environmental, health, and safety requirements.
- Delivering general project management, project scheduling, document management and cost control services.
- Preparing/reviewing/updating Dam Safety Plans and ensuring that they are adequately in place for execution.
- Assisting with procurement of contractors for rehabilitation works and adhering to relevant guidelines and standards.
- Managing rehabilitation contracts, including technical, environmental, social, health and safety (ESHS) supervision and compliance of the project during implementation.

[1] According to classification of assessments as per the World Bank Good Practice Note on Dam Safety, Oct. 2020.

- Providing construction management services including on-site QA and on the warehouse of the contractors Quality Assurance (QA) and Site/Factory Acceptance Tests (SAT and FAT), ensuring effective interface management between various construction contracts and supervision of contractors' environmental and social performance.
- Providing regular, timely updates to the Client on the Project progress and any emerging issues (through Project progress reports), including those related to ESHS performance and compliance.

The services are to be carried out in two assignments. Assignment **Part A** will be under a Lump-Sum contract, and **Assignment B** under a Time-based Contract. Commencement of Assignment Part B will be subject to approval by LRA. Several of the activities under both Assignments A and B would need to be implemented concurrently.

III. Scope of the Assignment

Part A: Review of Existing Studies and Preparation of Procurement Documents (Lump Sum Based Contract)

Task 1: Review of Previous Assessments and Preparatory Studies. OE is expected to carry out the following main activities.

- Conduct a detailed desk review of Report on the Due Diligence on Rehabilitation Needs of LRA (Due Diligence Report – Annex 1) and validate major findings related to mechanical, electrical, civil, and operational conditions.
- Summarize and prioritize the suggested interventions (e.g., inlet valve repair, turbine rehabilitation, SCADA systems, protection relays, etc.) from the current report, aligning them with the HPPs' operational priorities.
- Carry out on-site visit to verify the existing report's conclusions and propose refinement to the scope of rehabilitation (if required).
- Meet operations and maintenance (O&M) teams at each HPP to capture firsthand insights on recurrent issues, maintenance records, and safety concerns.
- Advise on the procurement packaging and approach for the needed rehabilitation.
- Update the existing cost estimates cross-referencing unit rates, international market conditions, and specialized equipment costs.
- Document any physical constraints (e.g., access for large components, crane capacity, location of penstocks, safety valve chambers, etc.) that may affect rehabilitation scheduling or budgeting.
- Update the Project Schedule (PS) identifying procurement steps, detailed design finalization, manufacturing, on-site works, and commissioning.
- Prepare an implementation schedule that minimizes generation down-time.

Task 2: Preparation of the Procurement Documents for Power Plant Rehabilitation. To support the client, the OE is expected to carry out the following main activities with procurement documents to be based on the relevant World Bank Standard Procurement Document to be provided by LRA. The World Bank Procurement Regulations for IPF Borrowers (Feb. 2025) would apply to the Project activities. The procurement is expected to be carried out following an open international competition using World Bank's Standard Procurement Documents (SPD) for Plant Design, Supply, and Installation with a Single Stage two envelope method without Pre-Qualification/Initial Selection (Click Here).

- Based on the due diligence findings and site inspections, prepare a detailed scope of rehabilitation for each HPP (e.g. head valve and inlet valves overhauls, turbine nozzles replacements, control-system upgrades with New SCADA systems, civil works).
- Propose clear technical performance criteria (e.g., output, efficiency, reliability, safety) to guide bidders.
- Draft the technical specifications for all major mechanical, electrical, and control-system upgrades (generators, governors, transformers, SCADA, protection relays, switchgear).
- Prepare the bill of quantities.
- Prepare all bidding documents (BDs) including technical qualification requirements and identify rated criteria to be used for technical evaluation of bids. The overall number of rated criteria should be kept to the essential minimum. The weighting for rated criteria will be determined based on the risk of the Project and will be advised by LRA in consultation with the World Bank.
- In line with the Environmental and Social Commitment Plan (ESCP) of the RESRP, update – if needed - the audit and ESMP report for the rehabilitation and operation of the HPPs. The OE will consult with LRA regarding the need to update the audit report or the ESMP to agree on the appropriate actions and update the reports (if needed). The OE will also ensure that the HPP rehabilitation works will be in full compliance with the relevant national legislation and the World Bank environmental and social standards.
- Review, and update if needed, the applicable environmental and social (E&S), and safety requirements as well as existing E&S documents, and include the relevant provisions and requirements in the procurement documents to ensure compliance with local requirements and World Bank's Environmental and Social Framework (ESF). The following E&S instruments were prepared for the Project: **E&S Audit of LRA HPPs (Aug. 15, 2024), E&S Management Plan for Rehabilitation of LRA HPPs (Aug. 15, 2024), Labor Management Plan (July 2025), and Stakeholder Engagement Plan (Aug 2024)[2].**
- Define training and other knowledge-transfer sessions that the Contractor would need to organize for LRA staff to strengthen the LRA team's capacity in O&M best practices and safety, and modern control systems, as well as environment and social risk management for HPPs.
- Prepare responses and clarifications to comments and questions to be provided by the World Bank following its review of the procurement document and finalize it for issuance.

Task 3: Support during Procurement of Contractors for Power Plant Rehabilitation. The OE is expected to support LRA during the tendering, evaluation, and awarding stages of the procurement process for the Power Plant Rehabilitation. This support includes, but is not limited to:

- Prepare responses to clarifications requests that may be submitted by potential bidders.

[2] This documents are available at the following link : https://www.litani.gov.lb/en-us/aboutlra/wordbankagreement

- Prepare or review addenda/amendments to procurement documents as needed.
- Organize and participate in pre-bid meetings/site visits, providing technical insights.
- Prepare a proposal-evaluation methodology and scoring framework, which should be clearly stated in the bidding documents.
- Conduct a thorough review of each bidder's qualifications (track record, staffing, method statement, etc.) and finalize technical evaluation of first stage Technical Proposals.
- Prepare a structured technical evaluation report highlighting compliance with technical specifications, qualification criteria, and identifying any non-material and material deviations.
- Review and evaluate second stage Combined Technical and Financial Proposals and prepare combined technical and financial evaluation report.
- Clarify questions and help prepare responses to complaints that may be submitted by bidders during stand-still period, and participate in conference calls/meetings to provide clarifications.
- Prepare responses to questions or comments from the World Bank regarding evaluation reports and make the required revisions to those evaluation reports.
- Prepare the contract and support the Client in contract negotiations.

Task 4: Detailed Dam Safety Assessment of Qaraoun Dam (Tier 2). The Tier 1[3] Safety Assessment of Qaraoun Dam concluded that more detailed assessment and examination of the dam safety will be required, which is also documented in the Environmental and Social Commitment Plan (ESCP)[4] of the Project. Therefore, the OE would be required to carry out detailed Tier 2 dam safety assessment with the focus on the following:

- Review engineering analyses as required (hydrological, geotechnical, seismic, structural, hydraulic, and so on) to fill any uncertainties or gaps identified by the Tier 1 assessment.
- Undertake detailed analyses of dam safety monitoring data since the beginning of the dam operation and check trends and anomalies, if any. This should also include recommendations on inspection procedures and repair works that may be required to reduce the leakage through dam body or seepage through dam foundation, if any.
- Review the stability analysis of the dam and associated structures under various loading conditions based on the specific site condition, national regulations, and/or international standards and practices. If necessary, perform independent stability analysis.
- Review and approve the ROV inspection plan to be carried out by a specialized contractor that will be hired by LRA. This will include: (a) ensuring the ROV contractor submits a detailed inspection methodology—including ROV equipment specifications (e.g. depth rating, camera resolution, lighting), navigation and positioning systems, inspection path coverage, and contingency

[3] According to classification of assessments as per the World Bank Good Practice Note on Dam Safety, Oct. 2020.

[4] This document is available at the following link : https://www.litani.gov.lb/en-us/aboutlra/wordbankagreement

protocols; and (b) verify that the plan includes inspection of vertical/horizontal joints, the power tunnel intake, drainage intake, and spillway structures as specified.

- Supervise on-site ROV operations and data capture. This will include: (a) monitoring daily ROV activities to confirm full coverage and video/data quality, especially at critical or previously leaking joints; (b) validate that the ROV team is logging exact joint positions, water leak rates (if visible), and other physical observations necessary to inform TOR development for future repair works.
- Verify and validate the Final Inspection Report. This will include: (a) review of the post-inspection report for completeness, including geo-referenced video/still imagery, condition assessments, defect mapping, and structural annotations; and (b) ensuring the report enables clear interpretation of leakage patterns and structural conditions to support decision-making and TOR preparation by LRA.
- Review the safety condition of the dam foundation and abutments, as well as the effectiveness of foundation treatment works for seepage control and slope stabilization based on monitoring records and seepage analysis. Additional survey or investigation may be requested if needed.
- Review the seismic hazard of the dam area, including any seismic records during operation, any damage or repair works during operation, and adequacy of loading criteria and conditions used for design of the dam and its seismic stability if the dam is located in a high-seismic area.
- Undertake flood hydrology assessment, adding inflow and outflow data during the operational period and assessing the adequacy of the design, and check flood and spillway capacity considering the current and future conditions of the catchment and reservoir silting.
- Check the condition and any damage (such as scouring and cavitation) in the spillway weir or chute, energy dissipating arrangements, rock slopes, and downstream river conditions, as well as any design issues. This should consider the "as built" dimensions of the spillway, the spillway flow conditions, and the physical condition of the spillway when reviewing the safe pages of the design and safety check floods.
- Review the upstream catchment and reservoir rim conditions with regard to potential landslides and required measures for instrumentation and monitoring, as well as physical interventions, if any.
- Review the silting level of the reservoir and sedimentation trends, condition of check dams, intakes, bottom outlets, including sediment flushing and sluicing facilities, if any, along with suitable sediment management measures. The Consultant will also be required to review existing bathymetric studies and recommend if a new study would be needed based on international standards.[5]
- Check the conditions of the intake and outlet works, including the capacity for emergency reservoir drawdown, and any damages and design issues.

[5] http://data.infopro.com.lb/file/Qaraoun%20reservoir%20bathymetric%20survey-Aug%202013.pdf

- Check the design and condition of electromechanical facilities and equipment, including bottom gates, hoisting mechanism, backup generators, and so on, and their quality and sufficiency—with due consideration to potential failure scenarios (severe flood, loss of power, loss of communications, and so on).
- In case of high-risk dams, undertake failure mode analysis, including potential failure mode analysis and brainstorm sessions as per the methodology under the Technical Note for potential failure mode analysis (PFMA).
- Provide key findings of the overall dam safety conditions and recommendations of required structural and nonstructural remedial measures based on these examination results and the potential risk of the dam.
- Perform a detailed topographic survey to prepare plans and sections of the dam and auxiliary works.

Task 5: Hydrology Study for Qaraoun Dam. The OE should carry out the following main activities under this task. It should be implemented concurrently with the Tier 2 assessment of the dam safety presented in Task 4.

a. ***Data collection and review***. This would include:
   - Compilation of historical hydrometeorological records (rainfall intensity, duration, frequency, and spatial distribution).
   - Collection of streamflow and reservoir inflow data.
   - Analysis of historical flood events in the catchment area.

b. ***Catchment analysis***. This would include:
   - Delineation of the dam's catchment area, including sub-basins.
   - Assessment of land use, topography, soil characteristics, and vegetation cover.
   - Determination of runoff coefficients and infiltration characteristics.

c. ***Rainfall-runoff modeling***. This would include:
   - development of rainfall-runoff models calibrated against observed data.
   - Application of extreme value analysis techniques (e.g., frequency analysis, statistical models) to estimate PMF.
   - Evaluation of the impacts of potential climate change on rainfall extremes and runoff.

d. ***Hydraulic and Hydrologic Analysis***. This would include:
   - Flood routing studies to simulate flood wave propagation through the reservoir and spillway. The assumptions on return periods of floods will be advised by the Client.
   - Assessment of spillway geometry and performance under extreme flow conditions.
   - Evaluation of storage capacity and water surface profiles during peak flows.

e. ***Risk and Safety Assessment***. This would include:
   - Review of existing dam safety criteria and operational guidelines.
   - Assessment of potential failure modes and the dam's margin of safety during extreme events.

- Uncertainty analysis and sensitivity studies to identify key parameters affecting PMF discharge.

f. ***Integration of findings***. This would include:

- Comparison of estimated Probable Maximum Flood (PMF) inflows with current spillway capacity.
- Identification of potential hydraulic bottlenecks or structural limitations.

Task 6: Design of Remedial Measures to Improve Qaraoun Dam Safety. Following completion of the hydrology study and dam safety assessment in Task 5, remedial measures need to be prepared. Those may focus on upgrading and expanding the dam's spillway infrastructure to safely manage extreme flows. This involves adding auxiliary spillways to boost discharge capacity, reinforcing structures with stronger materials, etc. These changes aim to eliminate bottlenecks and enhance the overall resilience of the dam against high-energy flood events. Additionally, operational adjustments may be required for effective flood management. Improved reservoir management strategies and real-time monitoring systems could be considered to optimize water levels and provide early warnings during extreme events. The Consultant is specifically expected to:

- Prepare conceptual designs and specifications for remedial measures that would be required for improvement of the dam safety based on the findings from the hydrology and dam safety assessment.
- Estimation of the costs of all remedial measures with the required level of the break-down to be agreed with LRA.
- Development of recommendations on types of contracts and procurement documents (from the range of standard procurement documents of the World Bank) to be used by LRA.
- Preparation of the procurement documents and finalization based on inputs from LRA and the World Bank.

The OE should plan its effort (person-days) under this task assuming that the scope of remedial measures would be limited to those identified in Tier 1 Safety Assessment of Qaraoun Dam. The additional measures that may be recommended during more detailed Tier 2 assessment would be negotiated separately as part of an amendment to this contract given that the scope cannot be known at this stage.

Task 7: Support During Procurement of Dam Safety Improvement Contractors. The OE would provide the required support during procurement, which would include preparation of clarifications and responses to the bidders, preparation of addenda to the procurement document (if required), evaluation of bids, preparation of bid evaluation reports, revisions to those bid evaluation reports following comments from the World Bank, participation in debriefing of bidders during stand-still period, contractual negotiations, and other.

Task 8: Preparation of Dam Safety Plan. Environmental and Social Standard 4 (ESS4) requires the preparation of the following dam safety plans for Qaraoun, Anan, and Awali dams. These dam safety plans need to be prepared by May 2026. The Consultant, with support from LRA, should also secure the required information and data on the works/activities under the World Bank financed Second Greater Beirut Water Supply Project (P504170) to understand the implications on this scope of work.

- ***Instrumentation Plan (IP)***. The IP is a detailed plan for the installation of instruments to monitor and record dam behavior, critical excavation slopes, structures and the related hydrometeorological, structural and seismic factors. The IP is to be prepared by OE based on a review of the inputs described subsequently, reviewed by the Client and the DSPOE, and submitted to the World Bank.
- ***Operation and Maintenance Plan (O&M Plan)***. The O&M Plan is to set out details of the organizational structure, staffing, technical expertise and training required; equipment and facilities needed to operate and maintain the dam; O&M procedures; and arrangements for funding O&M, including long-term maintenance and safety inspections.
- ***Emergency Preparedness Plan (EPP)***. This plan is to specify the roles of responsible parties when dam failure is considered imminent, or when expected operational flow release threatens downstream life, property, or economic operations that depend on river flow levels. It is to include the following: clear statements on the responsibility for decision making relating to dam operations and for the related emergency communications; maps outlining inundation levels for various emergency conditions; flood warning system characteristics; and procedures for evacuating threatened areas and mobilizing emergency forces and equipment. The plan for emergency communication is to include the mechanism through which potentially affected downstream communities will be informed. The plan itself will be prepared during implementation and is to be reviewed by the Client, DSPOE, and then World Bank. The Consultant should also carry out flood propagation studies for dam break case and create relevant flood maps downstream.
- ***Construction Supervision and Quality Assurance Plan (CSQAP) for Qaraoun dam***. The OE would prepare CSQAP for remedial dam safety improvement works if those are evaluated to be required following Tier 2 dam safety assessment of Qaraoun dam. CSQAP is to set out details of the organization, staffing levels, procedures, equipment and qualifications for supervision of the construction of the Project.

Part B: Project Implementation Support (Time Based Contract)

Task 9: Project Management and Control. The OE shall perform the overall technical coordination of the Project for the Client, which will include facilitating effective communication and coordination with all stakeholders (contractors, the World Bank, DSPOE, Dispute Resolution Board (DRB), if any, insurers and external inspection agencies) for all matters related to Project design, budgeting, planning, construction, quality assurance, claims management, commissioning and operation. The OE is expected to carry out the following specific activities:

- Oversee the Project's physical, financial, and contractual progress, providing to the Client regular updates that reflect the work status, disbursement status, potential issues (technical, contractual, interface, schedule, etc.), deviations, quality issues, risks and information related to existing and potential claims. This shall also include recommendations for adjustments to uphold the Project's performance, schedule, and budget. Simultaneously, the OE shall continuously monitor the construction activities against the schedules, identifying and addressing any deviations – or potential deviations – from the plans. If any deviations occur, or appear inevitable, the OE shall promptly inform the Client, propose measures to mitigate delays or interface issues or

cost overruns, and reflect modifications to the construction program and time schedule upon the Client's agreement.

- Prepare and regularly update the Project Schedule (PS). The PS should be updated at least every six months to reflect the actual progress of the works and any changes to the Project scope, design, schedule, financial constraints or any other change likely to have an impact on implementation. Each revision of the PS shall be consistent with the latest versions of all the Contractors' construction schedules and shall take into account the interfaces between the construction contracts as well as all relevant external constraints. In addition to presenting the updated Project construction schedule, each version of the PS shall summarize all current assumptions (technical, contractual, financial and others) as well as the changes occurred since the previous version and their impact on the schedule.

- Prepare a detailed budget for each rehabilitation package (and dam safety improvement) and for the whole Project, taking into account the specific cost structures and financial risks associated with each contract. The budget shall be regularly reviewed and updated (as a minimum on a six-months basis, or earlier in case of the occurrence of events that might have a significant impact on the Project budget) to ensure that Project expenditure is regularly monitored, and predictions are reliable.

- Monitor compliance of contractors with risk management obligations and immediately flag any non-compliances in this regard with the Client and implement mitigation measures. The OE shall develop contingency plans to address potential risks or delays that could impact the PS and cost and shall revisit them (as "living documents") and update them at regular intervals and in the case of major political, financial or supply chain threats.

- Manage changes to the Project scope, schedule, and budget in a controlled manner, ensuring that all changes are properly evaluated, authorized, and implemented in accordance with the relevant contract provisions.

- Conduct OHS audit and ESHS Training for the LRA staff working on the three HPPs to be rehabilitated. This will include detailed review of the existing OHS practices, and support LRA to establish a functioning OHS management system including recommendations for improving working conditions and worker safety. The OE will prepare emergency preparedness and response plan. The OE will develop a comprehensive ESHS training plan, acceptable to LRA, and will subsequently deliver this training to the appropriate LRA different management and worker levels.

- Establish a robust Document (Record-keeping) Management System that centralizes all Project-related documents in a secure, accessible, and easily searchable location. This shall include, but not be limited to, all contracts and all communication with contractors and design engineers, meeting agenda and meeting minutes, Project plans, risk registers, stakeholder communication logs, progress reports, and change requests. The system should consolidate all relevant project records, such as investigation records, testing results, visual inspection records, etc. from all contractors. The OE shall ensure that all Project stakeholders have appropriate access to the necessary documents, subject to the required confidentiality and privacy constraints.
- Advise the Client on an overall insurance strategy for the Project and propose terms and conditions of the main insurance contracts to be implemented by the Client. The OE shall monitor the compliance of individual contractors with the insurance-related provisions of their respective contracts.

- Facilitate the DSPOE site missions, which are anticipated to occur one to two times per year, and the additional DSPOE online meetings in between these missions. Fourteen days prior to these engagements, the OE shall supply the DSPOE and other relevant parties with appropriate documents for review. During these missions, online meetings, and site visits, the OE shall prepare appropriate presentations and shall support the Client in the conduct of the meetings, while also responding to any recommendations, information requests, or other related requests from the Panel or other parties. Furthermore, the OE shall promptly supply each Panel and other parties with a digital copy of the monthly progress report in a timely manner.
- Ensure that the comments and recommendations from the DSPOE on dam safety aspects are appropriately incorporated into the contractor and suppliers' designs, drawings and construction procedures.
- Assist the Client with conducting meetings and site visits with the DRBs, insurers, external auditors on Safety, Health, Environment, Social and Quality, the Government officials, representatives of the financier, or other visitors as directed by the Client.
- Develop a robust Occupational Health and Safety (OHS) monitoring system, aimed at keeping track of, recording, and reporting on incidents along with severity and frequency ratings. This OHS system will be part of the OE's broader environmental and social monitoring system, which is also to be fully documented.
- Monthly progress meetings with each contractor and designer, along with quarterly joint meetings with all parties, are to be arranged to discuss Project status and corrective actions.
- Prepare Monthly Progress Reports in a format approved by the Client, detailing the status of services, staff mobilization, local staff mentoring and training, projected cash flow versus Project budget, progress against approved PS, and impacts of claims and variations on the Contract Price and Time for Completion. These Reports shall also include details and metrics of contractors' environmental, social, health and safety performance and of OE's management of that performance, as agreed with the Client.

Task 10: Contract Management. The OE should carry out the following specific activities:

- Consistently monitor the performance of all contractors, ensuring adherence to the terms and conditions of their contracts. This includes tracking work progress, confirming that quality standards, as well as ESHS requirements, are met, and verifying the timely and budget-conforming submission of all works and deliverables. In case of non-compliance with ESHS requirements, OE will advise LRA on contractual remedies and provisions to be invoked so that contractors rectify the ESHS issues.
- Undertake all administrative tasks associated with contract management, such as maintaining contract documentation, processing contract payments, and assuring the fulfilment of all contractual obligations.
- Identify the necessity for and oversee all contract changes. This includes examining change requests, evaluating their potential impact on the Project, assisting in negotiating the technical, commercial and contractual change terms, and updating contracts as necessary including through Contract Amendments when needed. All documentation regarding these changes shall be accurately maintained and available for review.

- Handle potential claims from contractors, which may stem from changes in scope, unforeseen circumstances, or delays. This involves reviewing claim submissions, validating their legitimacy, evaluating their impact on the Project cost and schedule, assisting the Client in negotiating resolutions, and when necessary, advising the Client on escalating the claims for further dispute resolution as per the General Conditions of the prevailing contract.
- Manage any contractual disputes according to their formal role under each contract. This could, inter alia, involve making determinations or decisions according to the contract conditions. The OE shall also play a key role in identifying potential areas of conflict and dispute early on, proposing measures to prevent escalation into formal disputes, and documenting lessons from each dispute and its resolution for future reference.

Task 11: Construction Design Services. For power plant rehabilitation and dam safety improvement contracts, the OE, in close cooperation with the Client, shall review and approve the design documents prepared by the Contractors according to the specific conditions of relevant contracts. Following the review process, the OE shall either issue a "No-Objection" if the design meets all required criteria or reject the design if it does not conform to Project requirements or standards. In either case, the OE shall record all decisions and the rationale behind them, providing transparency and a reference for future considerations. The OE may also recommend modifications to the Client's Requirements. The OE's design review shall take into consideration the technical soundness of the proposed design, its compliance with specified design criteria and relevant contracts, codes and standards, its potential impact on the Project timeline, budget, and quality, as well as its compliance with the E&S documents under the Project. Should design modifications be required during contract execution, the OE shall propose technically feasible modifications or review and assess contractors'/suppliers' proposals in consultation with the Client.

Task 12: Site Supervision and Control of Works. The OE should carry out the following specific activities:

- Deploy necessary executive and supervisory staff during the implementation periods of all construction contracts. The OE should supervise the execution of the Project, ensuring the Contractors uphold a high standard of workmanship, meet the required quality standards, and comply with the provisions outlined in the construction contracts and the approved construction drawings, including provisions related to ESHS performance. It is important to note that in both cases, the OE should maintain a role of proactive vigilant monitoring, swift reporting and resolution, and adaptive problem-solving in the event of unforeseen circumstances or conditions that are unsafe or work in progress that is not in compliance with the requirements of contract(s).
- Scrutinize and review various Project components in collaboration with the Client. This includes examining the Contractors' construction plant and equipment, construction materials, method statements, testing procedures and results, concrete structures, steel structures, mechanical and electrical works, and other. This role extends to monitoring the manufacturing, installation, testing, commissioning, and initial operation of the equipment to be replaced or rehabilitated.
- Review all submittals, including method statements and construction/shop drawings, provided by the Contractors/suppliers, to ensure alignment with the construction contracts, construction drawings and specifications, and the safety and appropriateness of the work according to recognized and accepted practices. Should any issues arise or

if the drawings or documents do not conform to the Project specifications or standards, the OE shall object to them. If all elements are satisfactory, a Notice of No-Objection shall be issued.

- Monitor any emergency and unsafe conditions, immediately reporting to the Client for swift remedial actions. This will include immediate reporting of serious injuries or fatalities to Project workers, injuries or fatalities to other persons, damage to off-site property, and significant releases of hazardous substances or other environmental incidents.
- Promptly develop special reports suggesting appropriate solutions in the event of unforeseen circumstances necessitating modifications to the nature or cost of the works and the construction program.

Task 13: Monitoring Contractors' Compliance with the Provisions of the Project E&S Instruments, and Relevant National Legal Obligations. The OE shall ensure that the Contractors execute appropriately all the ESHS impact mitigation and monitoring measures as stipulated in the LRA audit report and LRA ESMP. The OE should carry out the following specific activities:

- Ensure that all Contractors prepare an acceptable, detailed Contractor-ESHS Management Plan (C-ESHSMP) prior to the commencement of construction activities. This will also include relevant requirements on Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH).
- Review and approve each C-ESHS-MP prior to authorizing the Contractor to mobilize equipment and workers to the site for anything other than surveys and measurements. The C-ESHS-MP will comprise a series of topical management plans, including labor management, traffic management plan, air quality, water quality, worker accommodations, worker GRM, occupational health and safety, solid and hazardous waste management, etc.
- Prepare the monthly reports, to be submitted to the Client, and quarterly reports, to be submitted to the World Bank, on Contractors' ESHS performance.
- Confirm that all Contractors are implementing their respective ESHS-MP and adhering to sound construction management guidelines. The monthly construction progress meetings would include review and discussion of Contractor ESHS performance during the preceding period.
- Undertake regular and random audits, supervisions, and inspections of sites where Contractors are operating, as required to ensure they are implementing their respective C-ESHS-MP. This also includes inspecting Contractor's accident logs, community liaison records, monitoring findings, grievance logs, and other ESHS related documentation, to verify compliance with LRA ESMP, Project LMP requirements. In the event of non-compliance with the Contractor's ESHS obligations, OE shall undertake such remedies as are provided in the contract to ensure the Contractor corrects deficiencies and comes into compliance.
- Develop and/or update ESHS Emergency Preparedness Response Plans for existing HPPs as recommended in the OHS audit and the LRA ESMP, including schedule for future updates.
- Monitor Contractors' compliance with implementation of a Waste Management Plan (WMP) to manage hazardous and non-hazardous solid and liquid waste, and air pollution consistent with the World Bank environmental and social standard 3 (ESS3)

for all relevant rehabilitation, construction activities and operations. The OE will advise LRA regarding the necessary periodic and ad-hoc environmental measurements for air and noise emissions and water quality parameters, measurement locations, and frequency to ensure E&S compliance during rehabilitation and operation. The OE will ensure that environmental measurements are carried out by the Contractor according to the ESMP and the C-ESHS MP.

- Confirm that during the commissioning and operation phase, and when work is finally completed at any workplace, the Contractors have conducted the final clean-up operation, including restoration of their sites and workplaces to their original conditions or to conditions satisfactory to the Client.
- Engage in periodic liaison with Project stakeholders to identify and discuss any actual or potential ESHS issues.
- Support the Client's oversight of the correct implementation and management of social risk mitigation measures, including the Stakeholder Engagement Plan, external stakeholder Grievance Redress Mechanism (GRM), and Community Health and Safety Management Plan in accordance with the ESCP relevant actions.
- Report to the Client within 24 hours any serious injuries or fatalities to Project workers, any injuries or fatalities to other persons, incidents of damage to off-site property, and significant releases of hazardous substances or other significant environmental incidents. The OE shall participate in timely investigation of all such incidents and within 30 days shall prepare root-cause analysis report, which needs to be finalized and submitted to the Client for further transmission to the World Bank. The OE shall then confirm whether the required corrective actions have been implemented as required, or take such actions as are necessary to ensure they are implemented.

Task 14: Inspection and Testing, and Services at Commissioning of Works. The OE shall regularly perform inspections of materials and workmanship and acceptance tests to ascertain their compliance with the construction contracts' specifications. Any on-site work that does not meet these specifications at any time during the implementation must be either removed or corrected. The OE should carry out the following specific activities:

- Undertake, in cooperation with the Client, inspection of key mechanical and electrical Project components in line with an Inspection and Test Schedule to be agreed with the Contractors and the Client. Manufacturing QA/QC inspections and witness and sign-off of Factory Acceptance Tests (FAT) events shall be performed for all major Project items to ensure compliance with the contract prior to dispatch of equipment to site. Audit and review of the associated QA documents and methodologies shall also be performed.
- Coordinate, monitor, witness and compile the records of commissioning procedures and tests to be implemented by Contractors and suppliers, and in this respect the OE shall, in cooperation with the Client, undertake all the Client's responsibilities in relation to testing and commissioning, including reservoir filling in a staged manner. The commissioning process will apply to all the main components of rehabilitation works.
- Conduct an in-depth inspection to assess the state of the works and ensure those meet all the stipulated standards and requirements, including dam safety. The OE shall assist the Client in taking over the completed works.

- In coordination with the Client, the OE shall facilitate the issuance of completion certificates, certifying that the works have been completed in accordance with the contracts' requirements, including ESHS requirements.

Task 15: Compilation and Monitoring of Punch Lists. The OE should carry out the following specific activities:

- Perform inspection of all works and installations, noting any areas that require additional work or rectification due to defects or non-compliance with the specifications, including defects and non-compliance with ESHS requirements.
- Compile a punch list for each construction contract. This record shall encapsulate all tasks that necessitate completion or remedial intervention, including ESHS completion or remedial intervention, thus serving as an essential guide for the Project's final stages.

Task 16: Verification of Contractor's Monthly Statements and Final Account. The OE should carry out the following specific activities:

- Review the Contractors' Monthly Statements and supporting documents. This process entails comparing the reported work progression against the actual work carried out on-site, as well as correlating the claimed charges with the contract rates. The OE shall verify the accuracy of the invoiced quantities, ensuring that they coincide with the work accomplished during the corresponding period.
- Upon satisfactory verification of the Monthly Statements, the OE shall issue Interim Payment Certificates or Notices of the amount considered due, depending on the conditions of the construction contracts, allowing the Contractors to receive payments from the Client. The OE shall ensure that these certificates or notices accurately represent the work completed to date and are in line with the contract's terms and conditions, including compliance with E&S requirements.
- At the completion of the works, the OE shall review the Contractors' Draft Final Statements and Final Statements, which represent the total amount due to the Contractors for the entire contracts and shall issue the Final Payment Certificates or the Notices of the amount considered finally due, depending on the conditions of the construction contracts. This includes verifying the final measurements and quantities, ensuring that all contractual obligations have been fulfilled, and confirming the final value of any adjustments, claims, or variations. The OE shall also ensure that all necessary contractual certificates, including the Defects Liability Certificate, have been issued before final payment.
- The OE shall provide the Client with regular reports on the financial status of the contracts. These reports shall include details of payments made, pending payments, anticipated final cost forecasts, and any other financial matters related to the contracts.

IV. Team Composition and Qualification Requirements for the Key Experts

General Experience of the OE firm: having been in business for at least 15 years with international experience in management and supervision of hydro power plants and dams infrastructure projects, with substantial experience in developing countries. Experience in the Middle East and/or Africa region is desirable.

Specific Experience of the OE firm:(i) At least 15 years of experience in the design and construction supervision of utility scale hydro power plants and dams with successful completion of at least three (3) projects relevant to these assignments in the last 10 years; (ii) Presence of skills in the areas of design and construction supervision of assignments similar to the Project, and (iii) supervision of environmental and social compliance of construction and/or

rehabilitation works with applicable policies of financing institutions. Similarity being size, complexity, technology, operational context and economic and social setting of the Employer Country.

The Consultant shall be responsible for providing all the necessary facilities to undertake the assignment including -- but not limited to -- the office space and office furniture and facilities, transport and accommodation for its entire staff. The Consultant shall make arrangements for off-site office space and personnel accommodation in Lebanon. *The Consultant shall include the cost for the above responsibilities and facilities in the proposed price.* The consultant is required to thoroughly appraise themselves of the legal and institutional framework governing the electricity sector in Lebanon. This includes understanding the regulatory environment, key policies, and institutional arrangements that impact the operation and management of hydropower and high voltage transmission. The consultant shall familiarize themselves with the roles and responsibilities of the LRA, as well as other relevant governmental and non-governmental entities involved in the sector. Additionally, the consultant must ensure compliance with local laws and regulations, including environmental and social safeguards, to effectively support the implementation activities under the Project. This comprehensive understanding will enable the consultant to navigate the complexities of the Lebanese legal landscape and contribute to the Project's success while ensuring alignment with national priorities and international best practices.

The Consultant's team will include a number of key staff as indicated in Table 1. The OE's key staff shall include a team of international experts with extensive experience of design, construction supervision and rehabilitation supervision of hydropower plants of comparable size. The team shall be supported by local expertise as suitable. The members of the team shall have the skills and experience necessary to undertake the range of tasks set out in this TOR. The OE shall arrange for appropriate home office support for the construction supervision and post-construction teams. The OE shall ensure that for each position of Key Experts an equivalent alternate is delegated and made available in case the Key Expert of primary position becomes unavailable for a period for whatever reason.

The home office-based staff are expected to travel to the field as necessary to carry out the assignment. The Key Staff that should meet the specified requirements related to qualifications and experience. For all Key Staff in the field offices, excellent knowledge of Arabic is required (speaking, writing) and proficiency in English language is highly desirable. For the home-based Key Staff, fluency in English is required (speaking, writing) and the ability to speak and write in Arabic is highly desirable. There must be sufficient bilingual capabilities in the team to effectively communicate internally, and with the Employer, contractors, and the funding agency. Professional English/Arabic interpreters should be included in the OE team (at each OE office for the Project) if the OE key field staff are not proficient Arabic communicators (speaking and writing). The consultant may combine one or more of the key staff among different project activities but has to show that the productivity and efficiency will increase by doing so.

Table 1: Minimum Staffing of Key Experts and Experience Requirements

Key Expert	Location	Qualification Requirements
Project Director	Resident in Head Office with frequent Project visits	At least a master's degree in electrical engineering or another relevant field. At least 25 years of relevant international experience in management of rehabilitation projects of comparable size;[6] design and

[6] Hereinafter, this means larger than 100 MW.

Key Expert	Location	Qualification Requirements
		construction of dams and hydropower plants comparable size, including concrete face rockfill dams (CFRDs), tunnels and powerhouses. At least 5 years of relevant international experience with similar rehabilitation or new HPP construction projects of comparable size financed by international financial institutions (IFIs). Excellent knowledge of English. Knowledge of Arabic and French is preferred
Chief Resident Engineer (CRE)	Resident on Site with frequent liaison with the Employer – deputizes for Project Director	At least a master's degree in electrical engineering or another relevant field. At least 20 years of relevant international experience in rehabilitation, maintenance and installation of electromechanical equipment deployed in hydropower plants as well as experience in design of SCADA, excitation and protection systems for projects of comparable size. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Electrical Engineer	Resident on Site	At least a master's degree in electrical engineering or another relevant field. At least 15 years of relevant international experience in design, construction and maintenance of electromechanical equipment for similar projects. Minimum field experience of at least two similar projects with nominal capacity for each unit equal or above 20 MW (implementation or supervision of implementation) during last 10 years. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Mechanical Engineer	Resident on Site	At least a master's degree in Mechanical engineering or another relevant field. At least 15 years of relevant international experience in greenfield and rehabilitation projects involving design, construction and maintenance of Francis and Pelton turbines, speed governors, actuators, head valves, inlet valves, hydromechanical works for hydropower plants. Minimum field experience of at least two similar projects with nominal capacity for each unit equal or above 20 MW (implementation or supervision of implementation) during the last 10 years. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Contract and Procurement Expert	Resident in Head Office with occasional Project visits	At least a bachelor's degree in electrical engineering, civil engineering, economics/business, or another related field. At least 15 years of experience in procurement and management of EPC contracts in large energy infrastructure projects, including hydropower. Involvement as procurement specialist/contractor manager in at least 3 projects during last 10 years financed by the World Bank or other IFIs.

Key Expert	Location	Qualification Requirements
		Excellent knowledge of English. Knowledge of Arabic and French is preferred
Instrumentation & Monitoring Engineer	Resident in Head Office with frequent Project visits	At least a master's degree in electronics/electrical/ automation engineering. At least 15 years of experience in design, construction, installation and maintenance of instrumentation and monitoring equipment and SCADA systems for similar projects, with minimum on field experience in working on at least two hydro power plant projects with nominal capacity for each unit equal or above 20 MW (implementation or supervision of implementation) in the past 10 years. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Dam Expert Engineer	Resident in Head Office with frequent Project visits	At least a master's degree in civil engineering, geotechnical engineering, or another relevant field. At least 15 years of relevant international experience in design and construction of dams, including CFRD. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Tunnels / Geotechnical Expert	Resident in Head Office with occasional Project visits	At least a master's degree in civil engineering, geotechnical engineering, or another relevant field. At least 15 years of relevant international experience in design and/or construction supervision of tunnels and spillways under comparable hydropower projects. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Geologist	Resident in Head Office with occasional Project visits	At least a master's degree in geology, civil engineering, geotechnical engineering, or another relevant field. At least 15 years of relevant international experience in geological and hydrogeological aspects of dam projects. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Hydraulics expert	Resident in Head Office with occasional Project visits	At least a master's degree in civil engineering and/or hydraulics. At least 15 years of relevant international experience in design of hydraulic structures in comparable projects. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Hydrology and sedimentation expert	Resident in Head Office with occasional Project visits	At least a master's degree in hydrology, environmental engineering, or another relevant field. At least 15 years of relevant international experience in hydrology and sedimentation related aspects of hydropower projects. Excellent knowledge of English. Knowledge of Arabic and French is preferred
Environmental and Social Expert	Resident onsite at least 3 days a week	At least a master's degree or equivalent in environmental science, environmental engineering, environmental planning, social science, and/or other relevant disciplines. At least 15 years of relevant international experience in

Key Expert	Location	Qualification Requirements
		monitoring and supervision of ESIA and ESMP implementation, and supervising contractors' compliance with E&S mitigation measures and monitoring activities under projects of comparable size, implemented under E&S policies of IFIs, including World Bank. Excellent knowledge of English and Arabic. Knowledge of French is preferred.
OHS Specialist	Resident on Site	At least a master's degree or equivalent in health, engineering, social science, and/or other relevant disciplines. At least 7 years of relevant experience in conducting OHS audits and risk assessments, supervising contractors' compliance with OHS requirements, and preparing OHS reports under infrastructure projects. Acknowledged OHS certification is a must. Excellent knowledge of English and Arabic. Knowledge of French is preferred

The OE Team should include additional non-key experts and administrative staff sufficient to carry out the assignment effectively and successfully. The OE Consulting Team is expected to be present throughout the Construction period.

The estimated level of effort for the assignment is approximately 400 professional staff-months., encompassing a multidisciplinary team of experts comprised of Team Leader/Senior Hydropower Engineer, Hydro-Mechanical Engineer, Electro-Mechanical Engineer, instrumentation and Monitoring Engineer, Dam Expert Engineer (CFRD), Civil/Structural Engineer, Hydrologist, Procurement Specialist, Environmental Specialist, Social/Health and Safety Specialist, and Resident/Site Supervision Engineers.

The assignment is expected to span **28 months** from the start date, with an anticipated commencement in **Q4 of 2025**.

V. Client's Inputs

The Client will provide all necessary data and information related to the project. The OE will make its own arrangements for office accommodation, residential accommodation, transport, and any other required facilities both at the Site and in Beirut.

VI. Deliverables and Reporting Requirements

The OE shall produce all reports described in the Scope of Consultancy Services, any other reports on such incidents that would possibly change the design or other aspects of the Project and any other reports requested by the Client. The deliverables are indicated in Table 2 below.

All reports shall be in the English language and submitted with all supporting documentation in electronic format (MS Word or the original file format) and accompanied by one hard copy. Technical reports shall be submitted in draft for review and comment by the Client, followed by the final report incorporating these comments. Draft documents are not required for progress reports, but any corrections shall be noted in subsequent reports.

Each deliverable will be reviewed by the Client and will be:

- Rejected, where it fails to meet the requirements of the TOR and the contract, or

- Accepted with Comments, where modest editorial revisions are required, or
- Fully Accepted.

Any "Rejected" report shall be resubmitted in draft for further comment. A deliverable 'Accepted with Comments' shall be corrected and then resubmitted until accepted as the final report. Acceptance will not be unreasonably withheld.

Table 2: Schedule of Deliverables

Task	Name of Deliverable	Timeline for submission from the date of contract commencement
Task 1	Review of existing documents and assessments	30 calendar days
Task 2	Procurement documents (with detailed technical specifications) based on the standard procurement documents of the World Bank	120 calendar days
Task 3	Clarifications to bidders on procurement documents, preparation of pre-bid meetings/visits, evaluation of bids, preparation and revisions to bid evaluation reports, preparation of responses to questions and complaints from bidders during stand-still period, drafting of the contract, contractual discussions.	Timeline shall be determined by bidding processes; bidding processes shall be completed within bid validity period
Task 4	Detailed Tier 2 dam safety assessment for Qaraoun dam	120 calendar days
Task 5	Hydrology study outputs	140 calendar days
Task 6	Design of the remedial measures and specifications, preparation of the procurement documents (with detailed technical specifications) based on the standard procurement documents of the World Bank	180 calendar days
Task 7	Preparation of clarifications to bidders on procurement documents, preparation of pre-bid meetings/visits, evaluation of bids, preparation and revisions to bid evaluation reports, preparation of responses to questions and complaints from bidders during stand-still period, drafting of the contract, contractual discussions.	Timeline shall be determined by bidding processes; bidding processes shall be completed within bid validity period
Task 8	All dam safety reports required under the Environmental and Social Commitment Plan (ESCP) under the Project	210 calendar days
Task 9	Contractual documents including schedules, budgets, cost estimations, draft communication on all contractual matters, including disputes, determinations, representation in DAAB, etc.	As required, based on contracts' timelines and within the deadlines prescribed in the contracts
Task 11	Reviews of design documents and assessment of the impacts on the Project of the findings from the studies (e.g. hydrology, dam safety)	As required, based on contracts' timelines and within the deadlines prescribed in the contracts
Task 12	Reviews of construction submittals and laboratory reports	As required, based on contracts' timelines and within the deadlines prescribed in the contracts
	Submission of daily, weekly and monthly construction reports	On a regular basis as required
Task 13	Review and monitoring of C-ESHS-MPs and ESHS reports	Within the deadlines prescribed in the contracts
	Submission of monthly and quarterly ESHS reports	Monthly

Task 14	Inspection, testing and commissioning reports, and issuance of completion certificates	As required, based on contracts' timelines and within the deadlines prescribed in the contracts
Task 15	Preparation of punch lists and reporting on the progress in addressing the items included in the punch lists	As required, based on contracts' timelines and within the deadlines prescribed in the contracts
Task 16	Issuance of Interim Payment Certificates or Notices and of the Final Payment Certificates or Notices	As required, based on contracts' timelines and within the deadlines prescribed in the contracts

Annex 1: Existing Technical, Environmental and Social Documents Pertaining to Rehabilitation of LRA Power Plants[7]

1- Due Diligence on Rehabilitation Needs of LRA Hydropower Projects (Sep. 2024)
2- Tier 1 Safety Assessment of Qaraoun Dam (Jul. 2024)
3- Tier 1 Safety Assessment of Anan and Awali Dams (Aug. 2024)
4- E&S Audit of LRA HPPs (Oct. 2024)
5- E&S Management Plan for Rehabilitation of LRA HPPs (Oct. 2024)
6- Labor Management Procedures (July 2025)
7- Stakeholder Engagement Plan (Aug. 2024)
8- Environmental and Social Commitment Plan (Sep. 2024)

[7] The documents numbered (1) to (8) are available at the following link : https://www.litani.gov.lb/en-us/aboutlra/wordbankagreement

Annex 2: List of Abbreviations and Acronyms

IBRD	International Bank for Reconstruction and Development
BDs	Bidding Documents
CFRDs	concrete face rockfill dams
CSQAP	Construction Supervision and Quality Assurance Plan
DAAB	Dispute Avoidance/Adjudication Board
DRB	Dispute Resolution Board
DSPOE	Dam Safety Panel Of Experts
EPC	Engineering, Procurement, and Construction
EPP	Emergency Preparedness Plan
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESHS	Environmental and Social and Health and Safety
C-ESHS-MP	Contractor-ESHS Management Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS4	Environmental and Social Standard 4
FAT	Factory Acceptance Tests
GRM	Grievance Redress Mechanism
HEP	Hydro Electric Plant
HPP	Hydro Power Plant
IFIs	international financial institutions
IP	Instrumentation Plan
LMP	Labor Management Plan
LRA	Litani River Authority
O&M	Operations and Maintenance
O&M Plan	Operation and Maintenance Plan
OE	Owner's Engineer
OHS	Occupational Health and Safety
PFMA	Potential Failure Mode Analysis
PMF	Probable Maximum Flood
PS	Project Schedule
QA	Quality Assurance
QC	Quality Control
RESRP	Renewable Energy and Systems Reinforcement Project
ROV	Remotely Operated Vehicle
SAT	Site Acceptance Test
SCADA	Supervisory Control and Data Acquisition
SPDs	Standard Procurement Documents
TOR	Terms Of Reference
WMP	Waste Management Plan