A. OBJECTIVES / PURPOSE OF ASSIGNMENT

1. Power Efficiency Improvement component of Nepal: Electricity Transmission Expansion and Supply Improvement Project loan will be implemented by Nepal Electricity Authority (NEA) and covers:

   (i) Package-I: Rehabilitation of Tinu (1 MW) hydropower plant

   (ii) Package-II: Rehabilitation of Sundarijal (640 kW) hydropower plant

2. Tinu hydropower station, located near Butwal, comprises two 250 kW turbines and generators plus one 500 kW turbine and generator, including a 2.4 km tunnel and with an underground silting chamber and powerhouse. The station was first commissioned in 1978 but was re-commissioned in 1983 AD owing to damage inflicted by flood.

3. Sundarijal hydropower station, situated 15 km northeast of Kathmandu, comprises two 320 kW Pelton Turbines and synchronous generators fed from a 1.7 km steel penstock. The power plant has been in operation since 1934 AD and has had minor upgrades to some electrical and mechanical components during its operational life. The penstock and station flows are part of the water supply system to Kathmandu Valley looked after by Kathmandu Upatayaka Khanepai Limited (KUKL).

4. The objective/purpose of the assignment is to assist NEA in the implementation of electro-mechanical rehabilitation works at Tinu (1 MW) and Sundarijal (640 kW) small hydropower plants having expertise especially in renovation, modernization and up-gradation (RMU) of electromechanical components of similar hydropower plants in the region.

B. SCOPE OF WORK

5. The Hydro Electrical/Mechanical Engineer will assist NEA in defining the scope of the project, preparing preliminary designs and assuring that all the steps are undertaken properly, so that the completed projects will deliver the quality, capacity, performance, reliability and economic life required. The assistance covers preparing technical specifications and bidding documents; support in the tendering process and bid evaluation; review and approval of contractor’s detailed design, supervision of construction, testing and commissioning works from the owner’s engineer perspective; and handing over the completed projects including issuance of provisional acceptance certificates and final acceptance certificates. In addition, the Consultant shall work closely with the NEA Project Management Unit (PMU), the Project Manager and NEA’s concerned Departments and Business Groups, through all stages of the assignment and
provide capacity building and training to NEA counterpart staffs and local community representatives.

C. DETAILED TASKS

6. The Consultant shall provide the following services including, but not limited to the following:

a. Preparation of Needs Assessment

(i) Develop a full understanding of projects requirements through discussion with NEA;

(ii) Review of all available project proposals, reports, drawings and plans prepared by or for NEA and related to the proposed rehabilitation projects;

(iii) Conduct necessary additional analyses and calculations for the projects to ensure that the proposed work meets all NEA overall requirements and current and future technical requirements. This is particularly relevant in relation to interconnection with surrounding networks, as networks have expanded and changed considerably since the hydro stations were originally designed. There is also a need to ensure that the rehabilitation is undertaken in a cost effective manner and to ensure that budgetary ceilings are taken into account;

(iv) Visit each hydropower stations under the scope and obtain data necessary for rehabilitation works preliminary designs, which shall include electrical, mechanical, civil, building and hydraulic aspects;

(v) Discuss stations’ operational issues, maintenance issues, rehabilitation requirements and training requirements with station staffs. It may also be necessary, with the assistance of station staffs, to discuss training requirements with local community representatives;

(vi) Prepare notes of the station visits and discuss these with the relevant Departments within NEA;

(vii) Conduct comprehensive cost benefit analysis on two scenarios: (i) replacement of the parts of equipments; (ii) replacement of whole set of equipments, taking into account the current technology status of hydropower E&M, the availability of such E&M in the market, environmental impact etc., and select the scenario which will maximize the benefit;

(viii) Prepare feasibility study documents, incorporating scenario assessments, design and rehabilitation concepts, project descriptions, definitions of works required and preliminary cost estimates.

b. Preparation of Technical Specifications and Bidding Documents

7. The Consultant shall prepare technical specifications and bidding documents, including, but not limited to the following:

(i) Concepts from the feasibility reports into preliminary designs, including simplified A4 drawings for equipment and powerhouse layouts and written definitions of scope and technical parameters. NEA will provide assistance in the preparation of drawings;

(ii) Descriptions of the key technical parameters, equipment and works for rehabilitation;

(iii) Specifications for equipments to be manufactured or refurbished;
(iv) Detailed definitions of electrical, mechanical and civil works to be undertaken, including relevant drawings showing dimensions and any constraints on physical size;

(v) Preliminary bills of materials and works quantities;

(vi) Recommendations on contract arrangements;

(vii) Prepare bidding documents including employer’s requirements, technical specifications, performance specifications, schedules, and drawings for bidding of the hydro stations on a turn-key basis.

c. Support in the Bidding Process

8. The Consultant shall review NEA’s approach and schedule for the bidding process and provide comments and recommendations on the approach, activities, schedule, organization, and responsibilities. The Consultant will assist NEA through the bidding process including the following activities.

   (i) Assist NEA in clarifying queries from prospective bidders during the bidding period;
   (ii) Carry out technical and financial evaluation of bids received and submit bid evaluation reports to NEA; and
   (iii) Assist NEA in contract negotiations and finalize contract documents.

d. Supervision

9. The turnkey contracts will cover manufacture and supply, repairs and installation, testing and commissioning of the equipments of hydro stations. The Consultant shall provide oversight of all aspects of the project in order to assure that they are conducted properly. This includes assisting in developing and implementing a quality assurance program for manufacturing, review and approval of design, monitoring schedule, inspection of equipment and materials upon arrival and upon installation, other site works and review of documents to assure quality of delivered goods, comparison of as-built drawings to design, and addressing shortcomings in any of these areas.

e. Testing and Commissioning

10. All new equipment and components of the stations will be subject to an acceptance test to demonstrate their capability to meet warranted design criteria. Tests shall also include full station operational, functional and performance tests, in accordance with international standards, to ensure that new equipment and overall systems performance in accordance with specified requirements.

11. For each test, the Consultant shall review the contractor’s test procedures for compliance with manufacturers’ requirements and design criteria. The Consultant shall witness the tests and review the test results. If test results are not satisfactory, the consultant shall ensure that any lack of compliance is addressed and that the equipment and overall systems shall be re-tested until compliant results are achieved.

12. During the commissioning phase, the Consultant shall provide training on the testing and commissioning of all aspects of the project. The Consultant shall assist NEA and coordinate with the Contractors in addressing any issues with the project components that
are unsatisfactory. At the end of this period, and when all acceptance tests have been completed to the Consultant’s satisfaction, the Consultant shall advise NEA that the construction is complete and all the project components are ready to be declared fully operational.

13. The Consultant shall also prepare and recommend provisional taking over certificates whenever due for the works or part of the works and alert NEA of work deficiencies and outstanding items, if any. The Consultant shall also confirm the remedial measures taken by the contractor, and recommend a final taking over certificate after expiry of the warranty period.

f. Capacity Building

14. During the first visit to Nepal, the Consultant shall perform a skills assessment and develop a training program for NEA counterpart staffs and local communities from the vicinity of each station. The NEA counterpart staff will assist the consultant during all phases of the project. The Consultant will be expected to work closely with the NEA staff and shall ensure that the NEA staff and local community personnel achieve higher skill levels as a result of project involvement.

D. EXPERTISE AND PERSON-MONTHS

15. It is expected that about 8 person-months of international consulting services will be required from an individual who has specialized experience in reform and rehabilitation works in small hydropower plants. NEA will provide counterpart staffs from the relevant Business Group and the power stations in accordance with the requirements during different stages of the projects.

Table 1: Indicative Expertise and Person-Months

<table>
<thead>
<tr>
<th>Expertise</th>
<th>International Consultants (pm)</th>
<th>NEA Counterpart Staff (minimum pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro Electrical/Mechanical Engineer</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>TOTAL pm</td>
<td>8</td>
<td>16</td>
</tr>
</tbody>
</table>

E. QUALIFICATION/EXPERIENCE OF CONSULTANT

16. **Hydro Electrical/Mechanical Engineer (International):** With at least Bachelor’s degree in electrical or mechanical engineering and minimum 15 years’ experience in hydropower station rehabilitation projects, 5 years of which shall have been in projects outside the Consultant’s home country. The Consultant shall have comprehensive experiences and knowledge on electrical and mechanical systems including control and protection system implemented in projects of similar type to the Tinau and Sundarijal projects and shall also have an understanding of civil engineering, hydraulic and hydrological aspects of hydropower stations. Proven people skills including training experiences are important. Experience shall cover hydropower station design, specification, construction, testing and commissioning plus hydro rehabilitation projects especially small hydropower projects.

17. It is expected that the Consultant will visit Nepal over a period of approximately 24 months, with an initial visit including field visit, skills assessment, preparation of a
training program, preparation of the feasibility studies and bid documentation, then short visits for the remainder of the project until commissioning is completed.

F. OUTPUT

18. The Consultant shall prepare an Inception Report within 4 weeks of assignment, monthly and quarterly progress reports as applicable based on field data and preparation of progress reports in a format and details acceptable to NEA and ADB.

19. The Consultant shall maintain records documenting decisions made at meetings, progress on project implementation, financial records and changes to the contract plans. The Consultant shall assist ADB in preparing a project completion report and monitoring and evaluation reports as required.

20. The consultant shall produce the detail scope of works of the project, cost estimates, technical specifications and bid documents.

21. All documents and reports would be made available on electronic format to ADB.

22. All reports will be in English language.
Invitation for Expression of Interest (EOI) for Individual Consultants

(First Date of Publication: September 26th, 2012)

Name of the Project: Nepal: Electricity Transmission Expansion and Supply Improvement Project
Component: Power Efficiency Improvement
Name of Donor Agency: Asian Development Bank

1. Nepal Electricity Authority (NEA) has received a loan from Asian Development Bank (ADB) towards the cost of Power Efficiency Improvement and intends to apply a portion of the proceeds of this loan to eligible payment under this contract.

2. NEA (the Employer) now invites Expression of Interest (EOI) from Eligible individual International Consultants, listing their specific position for which any person is applying in cover letter attaching the Curriculum Vitae (CV) in ADB format.

Consulting Services for Rehabilitation of Tinau (1 MW) and Sundarijal (640 kW) Hydropower Plants

<table>
<thead>
<tr>
<th>SN</th>
<th>Description</th>
<th>International</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Designation</td>
<td>Hydro Electrical/Mechanical Engineer</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No. of Consultants</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Duration</td>
<td>8 Person-months</td>
<td>Intermittent</td>
</tr>
</tbody>
</table>

3. The consultant shall be a native from ADB member countries. They shall be highly experienced in the related fields and possess good command in English.

4. The consultant shall also submit the certified copy of testimonials especially academic qualifications, trainings and job related experiences along with the proposal.

5. The consultant will be selected and engaged in accordance with the Guidelines on the Use of Consultants by Asian Development Bank and its Borrowers (April 2010) under the Individual Consultant Selection Method.

6. The terms and conditions of the contract and payments by the Rehabilitation of Tinau (1 MW) and Sundarijal (640 kW) Hydropower Plants project will be subjected to the terms and conditions of the agreement including the Guidelines on the Use of Consultant by Asian Development Bank and its Borrowers.

7. Tentative commencement date of the consultant will be November 2012.

8. Project area is Sundarijal, Kathmandu and Rupendehi District.
9. The EOI must be submitted online to ADB’s Consultant Management System (CMS) web-based portal not later than October 31st, 2012 within 12:00 PM PHT (UTC/GMT +8 hours).

10. Interested consultants may obtain further information from the office mentioned below during office hours and a copy of detailed TOR is available in www.adb.org or in www.nea.org.np.

Office of the General Manager  
Generation O&M  
Nepal Electricity Authority  
Durbar Marg, Kathmandu,  
Tel.: 977-1-4153032/4153172 Fax: 977-1-4153016  
Email: hydrooperation@yahoo.com