Terms of Reference
Project Supervision Consultant
SASEC: Power Transmission and Distribution System Strengthening Project (PTDSSP)

1. Background

1.1 Electricity is one of the key infrastructures for the acceleration of economic development of any country and is considered as an important input to improve quality of life. About 75% of the population of Nepal has access to electricity, but the quality and availability is poor. Considering the importance of quality of electricity, NEA has emphasized on improving the electricity quality through improvement and expansion in transmission and distribution network. NEA has realized that quality and reliable electric supply can exploit full potential benefit of the investment made in energy sector as well as can play valuable role in poverty alleviation, industrialization and improvement of quality of life.

1.2 Nepal has seen a slow structural transformation and achieved average economic growth for the past two decades, it must continue to create economic opportunities for new entrants to the labor force for sustained economic growth. The limited potential of job creation from agriculture sector not sufficient and creating more productive and well-paying jobs is a big challenge. More jobs can be created from manufacturing and production services which require massive industrialization throughout the country. Manufacturing, which has higher potential, is lagging and has contributed about 10% of gross domestic product (GDP) and about 12% of employment over the same period. National Planning Commissions Policy also calls for increasing the manufacturing sector's contribution to GDP and enhancing job creation in manufacturing sector. Without guarantee of proper and adequate electricity supply, no entrepreneurs will be keen to invest for any industries. Keeping this into account, Development of Industrial Corridors in Pokhariya (Birgunj) industrial areas is also proposed in this proposal.

1.3 Construction of new substations and transmission lines with distribution network reinforcement and modernization are the important factors to provide quality and reliable supply to the consumer, domestic, commercial and industrial. The proposed project will also support implementation of other system efficiency upgrades and efficiency measures such as advanced grid operations software, distribution system automation, and smart metering. System efficiency improvements and loss reductions will improve NEA's financial health, while customers will benefit from more reliable and improved quality of electricity supply.

1.4 The overall objective of the proposed project is to augment the transmission and distribution capacity in order to meet the future demand of electricity for domestic as well as expansion of existing industrial zones and to improve reliability and quality of

electric supply.

1.5 The implementation of the project will expand the transmission and distribution capacity as well as help to reduce system losses and line outages and improve the system reliability. In addition, construction of new substation and lines along with expansion of existing substations will help to meet the growing demand for electricity; accelerate the pace of electrification and helps in the development of industries which in turn increases the economic growth of the country and improves the livelihood.

Overall objectives of the sub-projects under PTDSSP in brief are:

- To meet growing demand of electricity and guarantee quality and reliable supply in Kathmandu valley: expansion and rehabilitation of distribution networks at various locations, reconfiguration of the primary feeders and augmentation of the 11/0.4 kV distribution substations.
- Augmentation of the grid substation capacity to feed primary distribution networks supplying the distribution network catering the needs of domestic as well as industrial consumers.
- To modernize the distribution system, development of smart network in including distribution automation and smart metering etc; in Kathmandu valley and all major cities outside Kathmandu valley which will help to reduce the losses, increase reliability of the supply.
- Development of infrastructures for industrial use or development of Industrial corridors to create suitable atmospheres for industries development and to support country's economic growth.
- In line with the Government policy of total sustainable energy access and grid access to all, the electrification of the un-electrified areas and reinforcement of Distribution Network under Province 2 are included in the scope of work.

As stated above, there is strong need of transmission and distribution capacity enhancement, distribution system modernization and reinforcement not only within the Kathmandu valley but throughout the country. In addition to this existing line and substation feeding Industrial Corridor are required to be augmented and new Industrial corridors are required to be developed to support industrial growth of the country. To fulfill this much needed requirements, PTDSSP has been proposed with the following activities which shall be the part of scope for Project Consultant Supervision:

A. Development/Augmentation of Industrial Corridor

- Construction of 20 km 132 kV DC line using HTLS conductor from Parwanipur to Pokhariya Substation, construction of 132/33/11 kV, 2x65 MVA SS at Pokhariya and associated facilities and upgrading of existing 132kV DC line from Pathlaiya to Parwanipur by the use of HTLS Conductor

B. Construction of 132/11kV substations in Kathmandu Valley.

- Construction of 132/11kV Substation at Thimi and Koteshwor. Substation Expansion work at Baneshwor. 132kV underground (UG) Line from Bhaktapur to Koteshwor via Thimi SS. 66kV UG line from Koteshwor to Baneshwor S/S.

C. Expansion of existing 220 kV Khimti-1, Barabishe and Lapsephedi Substation to 400 kV voltage Level.

1.6 Nepal Electricity Authority (NEA) is the Executing Agency (EA) for the propose project. The term "NEA", "EA" and "the Employer" have the same meaning and may be used interchangeably in this document depending on the context.

1.7 All subprojects listed in 1.5 shall be collectively referred to hereafter in this document as "the Project".

1.8 The engineering design, supply of plants and equipment, construction, installation, testing and commissioning of transmission lines and associated substations, communications and protection facilities for all subprojects of the Project will be completed through turn-key contracts awarded to contractors following ADB's Procurement Guidelines.

1.9 NEA seeks through this TOR to engage a team of Project Supervision Consultants (PSC) through a firm in accordance with ADB's Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers to supervise and implement the Project.

1.10 The team of consultants is referred to hereafter as "the PSC" or "the Consultant". The term "PSC" and "Consultant" may be used interchangeably in this document depending on the context. The services of the PSC are hereafter referred to as "the Services".

1.11 This document sets forth terms of reference (TOR) for the Services.

2. Objective of the Assignment

2.1 The services aim at providing high quality professional services to assist NEA in supervising, managing and implementing the Project and to ensure that the Project will be completed according to the schedule and that the completed Project will deliver the quality, capacity, performance, reliability and economic life as required by the Employer's requirement defined in the turn key contracts with the contractors.

3. Scope of the Services, Tasks (Components) and Expected Deliverables

3.1 Scope of the Services

The PSC is expected to deliver the Services for:

a) Project supervision and implementation of subprojects in 1.5;

b) Capacity building of NEA staff.

The PSC shall provide consulting services for:

- Review Procurement Documents and Designs, including designs and drawings submittals of the Contractor under the Contract packages and recommend for optimized designs
- Administer Construction supervision and assist in Contract management and administration under Contract packages, and
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Assist to fulfill Employer's requirement as defined in Contract

The brief description of Consulting Services is as follows:

3.2 Detailed Tasks

The PSC's detailed tasks are as follows:

3.2.1 Project Supervision

3.2.1.1 For each and all turn-key contracts for the Project, the PSC shall review and advise the NEA on approval of contractor's detailed design in accordance with the Employer's requirements and technical specifications in the contract. The design optimization shall be of prime focus during such review.

3.2.1.2 For each and all turn-key contracts for the Project, the PSC shall provide oversight of all aspects of the construction in order to assure that it is conducted properly in accordance with the contract.

3.2.1.3 To ensure quality in project implementation, the PSC shall develop and implement a Quality Assurance Program (QAP). The QAP shall ensure that the plants and equipment supplied and installed meet the performance standards and technical characteristics of the technical specifications. The QAP shall cover all aspects of the project implementation including review and approval of design; quality of works during construction; monitoring schedule; inspection of materials before shipment, upon arrival and upon erection; review of documents to assure quality of delivered goods and comparison of as-built drawings to design. Furthermore, shortcomings in any of the aforementioned areas shall be

addressed adequately by QAP.

3.2.1.4 The PSC shall assist Client to implement and management of the overall Contract of the above Project including but not limited to recommendation on Extension of Time, Bill verification, variation etc.

3.2.1.5 The PSC shall ensure the Contract execution is in accordance with the Contract schedule, Employer's requirements and technical specifications as specified in the contract and advice the Client to take necessary steps in due course.

3.2.1.6 For each and all turn-key contracts for the Project, the PSC shall supervise the testing and commissioning. All components of the lines, substations, SCADA, communications and protection will be subject to an acceptance test to demonstrate their capability to meet warranted design criteria. For each component subject to test, the Consultant will 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. 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 in this phase of the project and coordinate with the Contractor 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 will advise NEA that the construction is complete and all the project components are ready to be declared fully operational. The Consultant shall also prepare and recommend a provisional taking over certificate 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.

3.2.1.7 The PSC shall hand over the completed Project including issuance of completion certificates, provisional acceptance and final acceptance certificates to NEA.

3.2.2 Capacity Building of NEA staff

3.2.2.1 The PSC shall perform a needs assessment and develop a training program for NEA staff associated with the subprojects and working on the Project as PSC's counterpart staff. The training program shall include 132 kV and higher voltage class substation and transmission line design, protection system coordination. The NEA counterpart staff will assist the consultant to the extent possible during all phases of the project. All international experts of PSC are expected

to work closely with the NEA staff and shall ensure that the NEA staff persons achieve higher skill levels as a result of their involvement.

3.2.2.2 One of the basic objectives of the consulting services is the transfer of technology in this field to the NEA's engineers. This will be achieved by involving the NEA engineers with the international experts as much as possible in various activities of the project implementation during field works of the Consultant.

3.2.2.3 PSC shall arrange training sessions in Kathmandu for a total of 20 (twenty) engineers. The duration of each session shall be one month. The cost of such training including the cost of travel, boarding, lodging of the trainers, software costs, training materials and subsistence allowance of NPR 1,500.00 per trainee/day in connection with the Engineer's training on Kathmandu will be quoted under Provisional Sum. The training shall be conducted in the in following disciplines:

a) Complete Planning and Design of substation and transmission line of voltage level 132kV-400kV

b) Structure and foundation designs in Transmission Lines and Substation

4. Team Composition & Qualification/ Experience Requirements for the Experts and their Responsibilities

4.1 Team Composition

It is estimated that in total 245 person-months of services are required with 65 person months from international experts and 180 person months by national non-key experts. Details on expertise and person month requirements are in Table 1. The international expertise should be provided by a consulting firm specializing in designing the transmission and substation in partnership with national firm(s) and/or individual national consultants in Nepal.

Table 1: Expertise and person month inputs

Expertise	No of PM	Total REM	Total REM
		Field	Home
A. International Consultants (Key Experts)			
1.Team Leader/ Substation Engineer- Electrical	30.5	29	1.5
2. Transmission Engineer –Electrical	5.75	4.75	1
3. SCADA/Communications Engineer	5.25	4.75	0.5
4. Protection Engineer	5.25	4.75	0.5
5. Geotechnical Engineer	2	1.5	0.5
6.Civil Engineer	9.25	8.75	0.5

7. Structure Engineer	4.5	4	0.5
8.Environmental Safeguard Specialist	1.25	1	0.25
9. Social Safeguards Specialist	1.25	1	0.25
Sub Total- A	**65**	**59.5**	**5.5**
B. National Consultant (Non-key)			
1. Substation Engineer- Electrical	15	15	
2. Transmission Engineer - Electrical	10	10	
3. SCADA/Communications Engineer	10	10	
4.Civil Engineer	40	40	
5.Environmental Safeguard Specialist	7	7	
6. Social Safeguards Specialist	8	8	
7. Civil Supervisor	90	90	
Sub Total-B	**180**	**180**	**0.00**
Total (A+ B)	**245**	**239.5**	**5.5**

4.2 Qualification/Experience Requirements for the Experts

4.2.1 International Experts

a) **Team Leader and Substation Engineer-Electrical** shall have preferably Master's Degree in Electrical Engineering/High Voltage Engineering/Power System Engineering and preferably more than 15 years' experience in design/construction supervision of transmission substations of 400kV or higher voltage level. The expert shall also have experience in designing AIS and GIS substations. The expert shall have previous experience in detail design, preparation of technical specifications, cost estimate and construction supervision of transmission and distribution substations of different voltage levels. It is expected that the amount of time spent by the Team Leader in the field will not be less than 90 percent of the required total person month inputs from the Team Leader during the execution of the project.

b) **Transmission Line Engineer-Electrical** shall have preferably Master's Degree in Electrical Engineering/High Voltage Engineering/Power System Engineering and shall have preferably more than 10 years of experience in designing transmission line projects. The past experience shall include design of transmission line components and line of 132 kV or above voltage level in both underground system and overhead system (HTLS Conductor), preparing technical specifications and designing underground transmission network of 132 kV or above voltage level.

c) **SCADA/Communications Engineer** shall have preferably Master's Degree in Electrical/Communications Engineering or other relevant discipline with preferably over 10 years of experience in the design, selection and preparation of specification of SCADA and communication systems for transmission lines, substations and control center interfacing. The expert shall have previous experience in designing/planning SCADA/communication system for interconnected/integrated power grid system.

d) **Protection Engineer** shall have preferably Master's Degree in electrical engineering with protection specialization and/or further qualifications and training in protection for 400kV transmission systems and substations, with preferably more than 10 years's experience.

e) **Geotechnical Engineer** shall have preferably Master's Degree in Geotechnical Engineering and preferably more than 10 years' experience, with previous experience internationally in developing countries and with 132kV or above transmission line tower foundations soil testing and for substation structures.

f) **Civil Engineer** shall have preferably Master's Degree in Civil Engineering, with preferably more than 10 years of experience in design of 132 kV and above voltage level transmission line towers and substation structures. The expert shall have previous experience in design and construction supervision of 132 kV and above voltage level transmission line and substation projects.

g) **Structural Engineer- Transmission and Substations** shall have preferably Master's Degree in Structural Engineering, with preferably more than 10 years of experience in design of 132 kV and above voltage level transmission line towers and substation structures. The expert shall have previous experience in design and construction supervision of 132 kV and above voltage level transmission line and substation projects.

h) **Environmental Safeguard Specialist** shall have preferably Master's Degree in Environmental Science, Environment Management, Environmental Engineering or closely related discipline with more than 10 years of professional experience. The expert shall have experience in conducting environmental impact analysis (EIA), initial environmental examinations (IEE) of 132 kV or above voltage class transmission line and substation projects as per international standard and practice as well as well as latest ADB or other donor agencies guidelines with regard to environmental protection and resettlement. The specialist should be conversant with national laws relating to Initial Environment Examination (IEE)/Environmental Impact Assessment (EIA) and ADB's Safeguard Policy Statement 2009.

i) **Social Safeguard Specialist** shall have preferably Master's Degree in Sociology/Social Science/Anthropological Science with more than 10 years of professional experience. The Specialist shall have experience in preparation of resettlement plan and indigenous peoples plan (IPP) etc., in 132 kV or above voltage class transmission line and substation projects in accordance with the international practices as well as latest donor agencies' guidelines, preferably ADB Guidelines with regard to environmental protection and resettlement. The Specialist should be conversant with national laws relating to land acquisition and resettlement and ADB's Safeguard policy Statement 2009.

4.2.2 National Experts

a) **Substation Engineer-Electrical** shall have preferably Master's Degree in Electrical Engineering/High Voltage Engineering, preferably with more than 10 years of experience in design/construction supervision of 132kV or higher voltage level GIS substations. The expert shall have previous experience in detail design, preparation of technical specifications, cost estimate and construction supervision of transmission and distribution substations of different voltage levels.

b) **Electrical Engineer (Transmission)** shall have preferably Master's Degree in Electrical Engineering/High Voltage Engineering/Power System Engineering and preferably 10 years of experience in preparation of transmission line design and specifications or in construction, testing and commissioning of 132 kV or above voltage class transmission lines.

d) **SCADA/Communications Engineer** shall have preferably Master's Degree in Electrical/Communications Engineering or other relevant discipline with preferably over 10 years of experience in the design, selection and preparation of specification of SCADA and communication systems for transmission lines, substations and control center interfacing.

e) **Civil Engineer- Transmission and Substations** shall have preferably Master's Degree in Civil Engineering, with preferably more than 10 years of experience in design of 132 kV and above voltage level transmission line towers and substation structures.

f) **Environmental Safeguard Specialist** shall have preferably Master's Degree in Environmental Science, Environment Management, Environmental Engineering or closely related discipline with more than 10 years of professional experience. The expert shall have experience in conducting environmental impact analysis (EIA), initial environmental examinations (IEE) of 220 kV or above voltage class transmission line projects as per international standard and practice as well as well as latest ADB or other donor agencies guidelines with regard to environmental protection and resettlement. The specialist should be conversant with national laws relating to Initial Environment Examination (IEE)/Environmental Impact Assessment (EIA) and ADB's Safeguard Policy Statement 2009.

g) **Social Safeguard Specialist** shall have preferably Master's Degree in Sociology/Social Science/Anthropological Science with more than 10 years of professional experience. The Specialist shall have experience in preparation of resettlement plan and indigenous peoples plan (IPP)etc., in 220 kV or above voltage class transmission line projects in accordance with the international practices as well as latest donor agencies' guidelines, preferably ADB Guidelines with regard to environmental protection and resettlement. The Specialist should be conversant with national laws relating to land acquisition and resettlement and ADB's Safeguard policy Statement 2009.

h) **Civil Supervisor** shall have Diploma Degree in Civil Engineering, with preferably more than 7 years of experience or Bachelors in Civil Engineering with 2 years of experience in construction/supervision in transmission line and/or substation projects.

4.3 Responsibilities of the Experts

4.3.1 International Experts

All international experts indicated in Table 1 are considered as key experts. The main responsibilities of each international expert are highlighted, but not limited to, as follows:

(a) Team Leader and Substation Engineer

(i) As the Team Leader, the expert is responsible for:

- Leading and managing the entire team including both international and national experts and act as the team's point of contact with NEA and ADB.
- Preparing or leading the team to prepare all the reports as listed in the Reporting Requirements.
- Handling contract administration matters related to the PSC contract.
- Assisting PMD/NEA in Contract management & Contract administration of the Project.
- Reviewing the turn-key contractors' health and safety plans.
- Monitoring project progress against plan, report on progress, and propose remedial measures as necessary.
- Reviewing the contractor's claims for extension of time or additional costs; and preparing variation instructions and cost review; certifying invoices/volume of works completed and recommend for payment.
- Providing technical support to NEA in settlement of claims and disputes arising from the turn-key contracts.
- Perform a training needs assessment for NEA staff and preparing a training program with the assistance of the consultant team.
- Contribute to capacity building of NEA counterpart staff.

(ii) The Team Leader as a Substation Engineer-Electrical shall perform the following:

- Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program and contribute to capacity building of NEA counterpart staff.
- Make necessary inputs and advice to the project team and to NEA on related subject matters.
- Assist NEA in review and approval of contractor's drawings and technical information.
- Witness and certify main equipment shop inspections and assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.

- Supervise site construction and installation works in conjunction with NEA and other team members.
- Review and certify the contractor's testing and commissioning plans.
- Supervise testing and commissioning of substations in conjunction with NEA and other team members.
- Review, check and certify suppliers' equipment design, and approve the technical documents.
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Assist with the review of contractor's claims for extension of time or additional costs; and prepare variation instructions and cost review; certify volume of works completed withdrawal applications and issue of monthly and final payment certificates.
- Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents.

b) Transmission Line Engineer-Electrical

- Develop and maintain a project quality assurance plan for NEA; and ensuring that works are executed in line with the plan and project requirements.
- Checking the drawings and technical designs submitted by the contractors and recommending them to NEA for approval.
- Review, check and certify suppliers' equipment design, and approve the technical documents.
- Witness and certifying main equipment shop inspections.
- Assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
- Recommend the acceptability of designs and works carried out by the contractors and suggest corrective measures to be undertaken.
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Supervise the installation, testing and commissioning of the transmission line and substations.
- Review and certify the contractor's testing and commissioning plans.
- Supervise testing and commissioning in conjunction with NEA and other team members.
- Certify substantial completion and/or completion of main project components as defined in the contract documents.

c) SCADA/Communications Engineer

- Make necessary inputs and advice to the project team and to NEA on transmission line and substation communication matters.
- Assess NEA's existing SCADA and communications systems and prepare design concepts for interfacing with the transmission line and substations.

- Assist NEA in review and approval of contractor's drawings and technical information with regard to communication/SCADA system.
- Supervise site construction and installation works in conjunction with NEA and other team members.
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Review and certify the contractor's testing and commissioning plans.
- Supervise testing and commissioning in conjunction with NEA and other team members.
- Review, check and certify suppliers' equipment design, and assist NEA in approving the technical documents.
- Supervise installation, testing and commissioning of the transmission line and substations SCADA and communication systems. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
- Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

d) Protection Engineer (International):

- Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical and protection matters.
- Contribute to the Inception Report
- Assess NEA's existing protection systems and prepare design concepts for protection of the transmission line and substations.
- Contribute to capacity building of NEA counterpart staff.
- Assist NEA in review and approval of contractor's designs, drawings and technical information.
- Assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
- Supervise site construction and installation works in conjunction with NEA and other team members.
- Review and certify the contractor's testing and commissioning plans.
- Supervise testing and commissioning in conjunction with NEA and other team members.
- Review, check and certify suppliers' equipment design, and assist NEA in approving the technical documents.
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Witness and certify main equipment shop inspections.
- Supervise the testing and commissioning of the transmission line and substation protection systems. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
- Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

e) Civil Engineer -Transmission and Substation

- Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation structural matters.
- Prepare civil designs for control buildings (if required) and substation equipment structures.
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Review and check the civil designs of control buildings, civil layout of substation and other civil structures submitted by the contractors and assist in approval of contractor's designs, drawings and technical information.
- Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

f) Structure Engineer

- Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation structural matters.
- Prepare structure designs for towers and tower foundations (if required) and substation equipment structures.
- Produce optimized design as required by the Contract or as required by the Client in due course of implementation of the Project/Contract.
- Review and check the tower, tower foundation, pole foundation and substation structure designs including control buildings and other civil structures submitted by the contractors and assist in approval of contractor's designs, drawings and technical information.
- Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

g) Geotechnical Engineer

- Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program.
- Perform field sampling and measurements to assist in determination of site soil conditions in conjunction with other team members.
- Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation geotechnical matters.
- Contribute to capacity building of NEA counterpart staff.
- Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

h) Environmental Safeguard Specialist

- Make necessary inputs and advice to the project team and to NEA on environmental distribution networks and distribution substation technical matters.
- Support NEA in incorporating comments from approving agencies until it is approved.

- Prepare EMP for the transmission reinforcement component.
- Prepare construction contractors' environmental health and safety plan (EHS).
- Prepare Detailed Monitoring Framework to effectively monitor the implementation of various plans during construction and operation phase
- Assist NEA as necessary to complete the IEEs and/or EIAs if necessary.
- Conduct a detailed qualitative and quantitative analysis of the anticipated changes to the baseline to determine the direct, indirect, induced and cumulative impacts of the project in construction, phase. These impacts may include, but not limited to, loss of habitat and ecosystems, loss of flora and fauna, impacts on wildlife, food supply chain and migration patterns of wild life, water quality, emission of greenhouse gases, erosion and sedimentation, loss of physical and cultural resources, impacts associated with construction etc.
- Update the IEEs and/or EIAs and EMP for the individual subprojects and assist NEA in implementation of EMPs for the subprojects.
- Update the Social Impact Assessment (SIA) for each subproject.
- Update/ Review construction contractors' environmental health and safety plan (EHS) and recommend revisions as necessary.
- Conduct routine inspections of construction/installation activities including visual survey of ROW clearance, construction equipment storage areas, waste disposal areas and construction camps.
- Prepare semiannual safeguard monitoring report.
- Prepare an annual report on reforestation for each project component and sub-component requiring a reforestation program.
- Perform other functions as may be assigned or delegated by Team Leader from time to time.

i) Social Safeguard Specialist

- Update existing resettlement plan (RP) based selected transmission route alignment in accordance with the national laws, regulations and ADB's SPS 2009.
- Make necessary inputs and advice to the project team and to NEA on social safeguard issues as required by the national laws, regulations and ADB's SPS 2009.
- Prepare and /or update land acquisition and resettlement impact assessment based on selected route alignment and substation details.
- Prepare/review the entitlement matrix for each subproject listing all likely effects, such as permanent and or temporary land acquisition, and a study to determine the replacement costs of all categories of losses based on the asset valuation process, with particular attention to vulnerable groups including indigenous peoples, women, children and the poor and socially excluded.
- Update/Prepare the implementation schedule consistent with all the resettlement plan requirements, making sure that major components are carried out before the civil works
- Establish dialogue with affected peoples for incorporating their suggestions.
- Ensure compliance with all government rules and regulations and ensure that the

RPs are in compliance with ADB's SPS 2009.

- Provide guidance to the national environmental safeguard specialist and NEA's concerned staff responsible for social safeguard in data collection and census surveys of affected persons.
- Submit all finalized/updated RPs to ADB for review and clearance for ADB review and clearance.
- Prepare semiannual safeguard monitoring report.
- Perform other functions as assigned or delegated by Team Leader from time to time during the time of assignment

4.3.2National Experts

Although national consultants are classified as non-key in the proposal evaluation, they play important role in the PSC team with local knowledge of dealing with social, technical and geographical issues arising from the Project. Each national expert will perform the same or similar duties as his/her counterpart in the international team in his/her respective field.

5. Reporting Requirements, Time Schedule for Deliverables and Implementation Arrangement

5.1 The Consultant shall prepare various reports and maintain records documenting decisions made at meetings, progress on project implementation, financial records and changes to the contract plans. All documents and reports would be in electronic format to ADB and hard copies to NEA. The reporting shall, in general, comprise of the following:

- Inception report
- Manual for checking drawings of towers and foundations, substation structures
- Report on shop inspection and test witnessing
- Formats for site supervision and site supervision reports
- At NEA's request, all necessary reports concerning special matters related to the project (installation, work methodology, safety, claims, checklist for equipment testing and commissioning etc.)
- Monthly reports including other sub-projects under PTDSSP concerning physical progress/status of works, expenditures, delivery of materials etc. in the formats acceptable to NEA and ADB.
- Quarterly progress report including other sub-projects under PTDSSP giving the progress status, schedules, costs, budgets etc. in the formats acceptable to NEA and ADB.
- Semi -annual and annual environmental and social safeguard reports including other sub-projects under PTDSSP.
- Consolidated Project Completion Report (PCR) including other sub-projects under PTDSSP as per requirement of NEA and ADB.

5.2 All documents and reports would be made available on electronic format to ADB. All reports will be in English language.

5.3 The PSC shall report to the Project Management Directorate (PMD) of NEA and headed by the Deputy Managing Director who reports directly to the Managing Director of NEA. The PSC shall work closely with subproject managers, and their engineers, and NEA's specialized departments if necessary.

5.4 The Consultant is expected to commence the service in January 2020 and the duration of the service will be sixty (60) months.

6. Client's Input and Counterpart Personnel

6.1 Administrative support for Consultant Team: If required by local regulations, NEA will provide Consultant with necessary support letters for obtaining visas and permits for its experts. The cost and timing of obtaining the above is entirely the responsibility of the consultants.

6.2 Office Space, Office Equipment, Transportation and Accommodation: NEA will provide office space, necessary furniture and office equipment (computers, printers etc.) in Kathmandu. The Consultant shall make his own arrangements for transportation and accommodation for its personnel in Nepal. The Consultant shall arrange itself any other equipment and planning software required during execution of works. Consultant shall be responsible for international telephone bills, maintenance of office equipment and consumables necessary for its own use.

6.3 Support Staff for Team Leader: Support staffs required by the Team Leader shall be provided by PSC.

6.4 NEA Project Team: The subprojects shall have its own contract management team comprising of project manager, engineer and other support staff. The subproject team shall assist the consultant in collecting data required for study. The subproject team shall work in close collaboration with the Consultant's team and be fully involved in all aspects of the consulting services. Both NEA and Consultant's teams shall work together as one single team in all matters related to the Project.

7. Client will provide the following inputs, project data and reports to facilitate preparation of the Proposals:

7.1 NEA will facilitate access of the consultant to other government agencies for communications, collecting of relevant information, data documents, etc. and other activities related to the consultant’s assignment.

7.2 Necessary inputs required to facilitate the preparation of the Proposals can be downloaded from web site of Nepal Electricity Authority (https://nea.org.np), Ministry of Energy (https://www.moen.gov.np), Department of Electricity Development (https://www.doed.gov.np) and Water and Energy Commission Secretariat (https://www.wecs.gov.np).