




Detailed Terms of Reference as well as Document
Of
Request for Expression of Interests (EOI) for consultancy services for
pre-feasibility study & Initial Environmental Examination (IEE) of
North-Bengal Coal Fired Thermal Power Plant having 2x660 MW
capacity at suitable place on the bank of the Jamuna River in
Gaibandha District of Bangladesh.

May-2017

INSTRUCTION TO THE APPLICANTS

1. Application of the interested firms must include:
- i) Name of the Lead (Foreign) Firm with complete address, Cable, Fax, Telephone Nos., E-mail address etc.
 - ii) Name of the Associated (National) Firm with complete address, Cable, Fax, Telephone Nos., E-mail address etc.
 - iii) Notarized Joint Venture/Consortium/Association Agreement (JVCA) on Non-Judicial Stamp of the firms for the said consulting service. The value of Non-Judicial Stamp should be Tk. 300.00 (Tk. Three hundred).
 - iv) The name of the employees/owner(s) of the firms and corporate profile of the firms.
 - v) The name and qualification of the Management/Administrative Personnel.
 - vi) List and qualification of the key-personnel likely to be involved in the proposed consulting service. The proposed fields of expertise for the said consulting service would be at least the following:

Sl. No.	Field of Expertise	Man-months	
		International	National
1	Mechanical Engineer (International) (Team Leader)	3	-
	Mechanical Engineer (National)	-	2
2	Electrical Engineer (International)	1	-
	Electrical Engineer (National)	-	2
3	River Training Expert (International)	1	-
	River Training Expert (National)	-	2
4	Economist/Financial Analyst (National)	-	1
5	Rail track construction Expert (International)	1	-
	Rail track construction Expert (National)	-	3
6	Coal Handling Expert (International)	1	-
	Coal Handling Expert (National)	-	1
7	Civil Engineer (National)	-	2
8	Geotechnical Specialist (International)	1	-
	Geotechnical Specialist (National)	-	2
9	Hydrology Expert (International)	1	-
	Hydrology Expert (National)	-	2
10	GIS, RS and Auto-CAD Specialist (National)	-	2
11	Environmental Expert (International)	1	-
	Environmental Expert (National)	-	2
12	Morphologist and Water Resources Engineer (International)	1	-
	Morphologist and Water Resources Engineer (National)	-	2
13	Chemical Engineer (National)	-	1
14	Ecologist (National)	-	1
15	Socio-Economist (National)	-	1
16	Fisheries Specialist (Biologist) (National)	-	1
17	Soil and Agricultural Specialist (National)	-	1
18	Reimbursable Expenses (Per Diem allowance, Traveling Expenses, Equipment, Instruments, Laboratory test, Sub Contract, Local Transportation, Office rent, Clerical Assistance, Use of Computer Software, Report Preparation etc.)	-	-
19	Contingency	-	-
Total		11	28





- (vii) Identity, Structure, Organization of the firm(s) including copies of the documents defining the constitution or legal status, place of registration and principal places of business and/or principal offices of the company/firm.
 - (viii) Details of vehicles, instruments & office equipment the firm owns.
 - (ix) Audited Financial Statements of the firm for the last five fiscal years.
 - (x) Experience of the firms along with a list of similar work at hand or carried out since 2007.
2. Applicant must submit information using the attached table/format [Annexure-1 to 6] with the document. The submitted document must be sealed and signed by a person duly authorized by the consulting firm.



(Md. Rafiquddaula)
Manager (Procurement)
Ashuganj Power station Company Ltd.
Ashuganj, Brahmanbaria, Bangladesh.



Curriculum Vitae (CV) for Each Proposed Professional Staff

1	PROPOSED POSITION FOR THIS PROJECT	<i>[From the Terms of Reference, state the position which the Consultant will be engaged. Only one candidate shall be nominated for each position].</i>			
2	NAME OF PERSON	<i>[state full name]</i>			
3	DATE OF BIRTH				
4	NATIONALITY				
5	MEMBERSHIP IN PROFESSIONAL SOCIETIES	<i>[state rank and name of society and year of attaining that rank].</i>			
6	EDUCATION:	<i>[list all the colleges/universities which the consultant attended, stating degrees obtained, and dates, and list any other specialised education of the consultant].</i>			
7	OTHER TRAINING	<i>[indicate significant training since degrees under EDUCATION were obtained, which is pertinent to the proposed tasks of the consultant].</i>			
8	LANGUAGES & DEGREE OF PROFICIENCY	Language	Speaking	Reading	Writing
		<i>e.g. English</i>	<i>Fluent</i>	<i>Excellent</i>	<i>Excellent</i>
9	COUNTRIES OF WORK EXPERIENCE				
10	EMPLOYMENT RECORD	<i>[The Consultant should clearly distinguish whether as an "employee" of the firm or as a "Consultant" or "Advisor" of the firm].</i>			
	<i>[starting with position list in reverse order every employment held and state the start and end dates of each employment]</i>	<i>[The Consultant should clearly indicate the Position held and give a brief description of the duties in which the Consultant was involved].</i>			
	EMPLOYER 1	FROM:	TO:		
		<i>[e.g. January 1999]</i>	<i>[e.g. December 2001]</i>		
	EMPLOYER 2	FROM:	TO:		
	EMPLOYER 3	FROM:	TO:		
	EMPLOYER 4 (etc)	FROM:	TO:		

11 WORK UNDERTAKEN THAT BEST ILLUSTRATES YOUR CAPABILITY TO HANDLE THIS ASSIGNMENT

[give an outline of experience and training most pertinent to tasks on this assignment, with degree of responsibility held. Use about half of a page A4].

CERTIFICATION *[Do not amend this Certification].*

I, the undersigned, certify that (i) I was not a former employee of the Client immediately before the submission of this proposal, and (iii) to the best of my knowledge and belief, this bio data correctly describes myself, my qualifications, and my experience. I understand that any wilful miss-statement described herein may lead to my disqualification or dismissal, if engaged.

Signature

Date of Signing

Day / Month / Year



Name and Qualification of Management/Administrative Personnel

Serial No	Name of the Personnel	Position at the Firm	Temporary/ Permanent	Educational Qualification	Experience in years

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(Signature)

Financial Statement

Summary of Assets & Liabilities:

Sl. No.	Year	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
1	Total Assets					
2	Total Liabilities payment					
3	Total investment					
4	Operative Expenditure					
5	Taxes Paid					
6	Profit after payment of Taxes					
7	Turnover [Sl. No. 2+3+4+5+6]					

Biraj

CA

Details of Vehicles, Instrument and Office Equipment

Sl, No.	Name, Brand of the Vehicles/Equipment, Year of Manufacture	Model No., Serial No./ Registration No.	Present Condition

[Handwritten Signature]

[Handwritten Mark]

Specimen form for Similar Experience of the Firm

The following format should be used to indicate the similar experience of the firm in projects.

Project Name		
Project Location	Start Date (M / Y)	Completion Date (M / Y)
Name of the Client with address and Contact number		
Contract amount		
Name of the associated firm (if any)		
Narrative description of actual service provided by the firm for the project:		




Name of the Firm.....

Signature.....

Experience of the firm in other works (for last ten years).

Sl. No.	Name of Services	Name of Client with address and Contact number	Contract amount	Start date	Completion time





Terms of Reference for consulting services for pre-feasibility study & Initial Environmental Examination (IEE) of North-Bengal Coal Fired Thermal Power Plant having 2x660 MW capacity at suitable place on the bank of the Jamuna River in Gaibandha District, Bangladesh.

1.0 Background

Ashuganj Power Station Co. Ltd. (APSCL) is an enterprise of Bangladesh Power Development Board (BPDB) which is a Generation Company and located at Ashuganj, Brahmanbaria. Its total installed capacity of 10 units is 1723 MW at present. APSCL is contributing as low cost power to the grid. As a generation company, Ashuganj Power Station Company Ltd. has been incorporated under the "Companies Act 1994" on 28 June 2000 and is functioning from June 2003. The company has a target to increase its capacity up to 3,800 MW by 2021 and 6,500 MW by 2030 with new generation to congregate the government vision of power generation.

Natural gas reserve is depleting and recent gas demands are escalating in other sectors of the country. To enhance the fuel diversification for power generation, selecting coal as a primary option is a necessity. Power Division, Peoples Republic of Bangladesh has a target of 20,000 MW coal fired generation (approximately) by 2035 under the "Power System Master Plan 2016, PSMP". To fulfill the target of PSMP 2016, APSCL intends to construct an Ultra-Super Critical 2X660 MW indigenous coal fired thermal power plant in the Northern area of the country.

2.0 Objective of the study

The study for the coal fired Thermal Power Plant Project shall be based on indigenous coal as primary fuel. The objective of the study is to find the suitable site on the bank of the Jamuna river at Saghata & Fulchari Upzilla or any suitable location in Gaibandha district in Rangpur Division, determine the detail dedicated broad/ meter gauge rail route from coal mine at Dinajpur district to plant site area to carry indigenous coal and determine the detail river training scheme to protect the power plant's embankment erosion considering the impact on environment and power evacuation. In order to conduct the pre-feasibility study including site selection, Initial Environmental Examination (IEE) and identify possible Environmental and Socio-economic Impacts with the possible mitigation measures and a tentative Environmental Management Plan.

3.0 Scope of Services

The scope of services under this study will include the following but shall not limited to:

Pre-Feasibility Study, Initial Environmental Examination (IEE)

3.1 The scope of services for the pre-feasibility study is as follows:

- Prepare maps using Satellite Images (GIS and RS studies) to be required in the pre-feasibility stage which will help in pre-feasibility study;
- Site selection for power station;
- Factors and issues to be considered in site selection so as to minimize and mitigate the costs and impact of the power generation facilities and produce reliable cost-effective power to Ashuganj Power Station Company Ltd.;
- Limited spot level survey (coarse level and contour level);
- Map setting, map referencing, required land area estimation, map digitizing, boundary survey etc.;



- Prepare the preliminary planning and design of site plan showing the layout (viz. plant area, stack yard, coal bunker, rail route, river training etc.);
- Tentative delineation of project boundary with land classification and ownership status;
- Provide the rail, road and river communication systems of the proposed areas;
- Power evacuation facilities;
- Suggest the rail route of coal transportation from coal mine at Dighipara, Fulbari in Dinajpur, and its handling up to the plant;
- Suggest the detail river training scheme to protect the power plant's embankment erosion;
- Prepare a transportation system of heavy lift equipment & machineries during construction and O & M of the power plant;
- Prepare the preliminary coal unloading system from train wagon to belt conveyer or suitable equipment/ facilities;
- Find out possible sources of availability of requisite water with their suitable depths;
- To conduct preliminary bathymetric & hydro-morphological study of the river in the vicinity of the proposed project area;
- Prepare the preliminary planning of ash handling system;
- Prepare a preliminary report on people resettlement and the cost analysis of resettlement;
- Provide suitable plant, machineries and equipment specifications;
- Provide source of condenser and others equipment's cooling water;
- Provide the potential capacity of the proposed coal based power plant considering future capacity expansion.
- To conduct detail sub soil investigation and analysis.
- Assessment of flooding pattern and flood vulnerability along with drainage characteristics in and around the proposed project area
- Prepare the planning and design of site plan showing the layout, dividing the total site into main salient sub-areas (viz. plant area, stack yard, rail route, river training, residential area and common service areas along with approach and internal roads, jetty etc.);
- Prepare the planning of bottom and fly ash handling system;
- Project Economical and Financial analysis;
- Examine and propose a detail coal handling system at the site that will meet the coal delivery requirements of the plant and handle adequate deliveries of coal for plant of 2 x 660 MW which should include the following:
 - a) Assess daily requirement of coal for the proposed plant;
 - b) Rail route and conveyor system to transport coal from mine to power generation plant;
 - c) Coal storage facility and handling from stack yard to coal processing system of power plant;
 - d) Identify in detail the coal handling/ delivery system that should be within the scope of power generation projects with the view that operation of the coal handling/delivery system should not be disrupted or impaired;
 - e) Prepare an estimation to build up a dedicated broad/ meter gauge railway line to carry the coal required for the plant;

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(Signature)

3.2 Scope of services for Initial Environmental Examination (IEE) :

The scope of services for the Initial Environmental Examination (IEE) includes the followings:

- o Land use/ Land cover including ecologically critical area, national parks, forest, orchard, cultural heritage site etc.(if any), in the site selected for the power plant;
- o Meteorological data collection of the site from Bangladesh Meteorological Department (BMD);
- o Hydrological and morphological data collection from BWDB and BIWTA;
- o Primary and Secondary Socio-economic data collection;
- o Rail way data collection from BR and analysis;
- o Water resources and soil salinity data collection from BWDB and SRDI;
- o Collection of Environmental quality data including soil investigation, air quality, water quality, noise level etc. for the selected site;
- o Sources of water during construction and operation;
- o Effluent and kitchen disposal point(s) including construction period;
- o Establish the environmental and social baseline condition in respect of water resources, air quality, noise level, land resources including land use/land cover, agriculture, fisheries, ecosystems and socio-economic condition;
- o Conduct public consultation meetings;
- o Identify the Important Environmental and Social Components (IESC);
- o Assessment of initial impacts of the proposed power plant on the environmental and social components;
- o Assessment of the impact of traffic movement on locality during development/ construction works;
- o Preparation of preliminary Environmental Management Plan (EMP);
- o Preparation of preliminary Resettlement Action Plan;
- o Risk and hazard analysis;

4.0 Study Schedule

The study is proposed to be commenced immediately and is scheduled for completion in within 3 (three) months. The study team is expected to mobilize immediate after the award of contract and the contract effective date.

5.0 Reporting Requirements

The following reports in connection with the pre-feasibility study as well as IEE study of the power plant of 2 x 660 MW capacity is required to be prepared by the consultant and to be submitted to the Managing Director, APSCCL:

- o Inception Report is to be prepared and submitted within 15 days from the contract effective date;
- o Monthly progress report is to be prepared and submitted within 7 days of the next month;
- o All data, calculations, mathematical study formula and modality, used & collected by the consultant should be provided to APSCCL both in soft & hard copy.
- o Draft IEE Report is to be prepared and submitted at the end of 60 days from the contract effective date;
- o Draft Pre-feasibility study report is to be prepared and submitted at the end of 60 days from the contract effective date;
- o Final Pre-feasibility study report with incorporated Employer's comments on draft report is to be prepared and submitted at the end of 90 days from the contract effective date;
- o Final IEE Report with incorporated Employer's comments on draft report is to be prepared and submitted at the end of 90 days from the contract effective date;



- Survey of Rail route for coal transportation from coal mine (Dighipara/Fulbari of Dinajpur District) to power plant site, coal bunker, stock pile with conveyor belt facilities, river training scheme to protect the plant's embankment's erosion are to be provided in the reports;

All the reports mentioned above are to be accepted by the Client (APSCL).

All reports are to be submitted in 5 (five) hard copies with soft copy.

6.0 Responsibilities of the client

The consultant shall work under the direct supervision of the Project Director/ Concern Department or Officials. The concerned offices of APSCL shall assist the study team as required in case of any unforeseen events, in terms of physical or social obstacles at field levels; the concerned field offices of the APSCL will take initiatives to solve it within their reach and ensure good working environment.

7.0 Responsibilities of the consultants

The consultants shall carry out the study as detailed in the "Scope of services" and "Responsibilities" in the best interest of the Clients for the successful realization of the projects with all reasonable care, skill, sound engineering, administrative and financial practices and shall be responsible to the APSCL for discharge of responsibilities.

For smooth completion of the study; the Consultant shall collect and carryout of the following data, services and facilities:

- Hydrological, meteorological, morphological data and records on irrigation and drainage systems;
- Hydrological, morphological, environmental, social and institutional aspect of the study.
- Available maps such as planning map, project index maps, contour maps, mouza maps etc.
- Studies carried out in relation to generation of secondary information and future plans.
- Agricultural and environmental data, etc.



8.0 Staffing

8.1 For pre-feasibility and IEE Study:

The person-months and field of expertise of the professional for the pre-feasibility study should include the following:

Sl. No.	Field of Expertise	Man-months	
		International	National
1	Mechanical Engineer (International) (Team Leader)	3	-
	Mechanical Engineer (National)	-	2
2	Electrical Engineer (International)	1	-
	Electrical Engineer (National)	-	2
3	River Training Expert (International)	1	-
	River Training Expert (National)	-	2
4	Economist/Financial Analyst (National)	-	1
5	Rail track construction Expert (International)	1	-
	Rail track construction Expert (National)	-	3
6	Coal Handling Expert (International)	1	-
	Coal Handling Expert (National)	-	1
7	Civil Engineer (National)	-	2
8	Geotechnical Specialist (International)	1	-
	Geotechnical Specialist (National)	-	2
9	Hydrology Expert (International)	1	-
	Hydrology Expert (National)	-	2
10	GIS, RS and Auto-CAD Specialist (National)	-	2
11	Environmental Expert (International)	1	-
	Environmental Expert (National)	-	2
12	Morphologist and Water Resources Engineer (International)	1	-
	Morphologist and Water Resources Engineer (National)	-	2
13	Chemical Engineer (National)	-	1
14	Ecologist (National)	-	1
15	Socio-Economist (National)	-	1
16	Fisheries Specialist (Biologist) (National)	-	1
17	Soil and Agricultural Specialist (National)	-	1
18	Reimbursable Expenses (Per Diem allowance, Traveling Expenses, Equipment, Instruments, Laboratory test, Sub Contract, Local Transportation, Office rent, Clerical Assistance, Use of Computer Software, Report Preparation etc.)	-	-
19	Contingency	-	-
Total		11	28

9.0 Qualification and Experience

9.1 For pre-feasibility study

Educational qualifications, experiences and responsibilities of the professional staff for the pre-feasibility study should be as follows:

9.1.1 Team Leader

Qualification:

- i. He/she shall be at least Bachelor in Mechanical Engineering; Master in Mechanical Engineering will carry maximum credit.
- ii. He/she shall have experience in similar nature of works. 25 years of experience in similar nature of works will carry maximum credit.
- iii. He/she have relevant experience in coal fired Power Plant for at least 5 (five) years.

Relevant experience means experience in generation procedure by coal based Power Plant as well as in gas infrastructure, energy, transport, urban and/ or natural resources management sector in Bangladesh or similar climatic, topographic and socio-economic environment. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) shall maintain liaison with the sponsor, donor and other concerned agencies;
- (ii) guide and co-ordinate all project activities;
- (iii) interpret the environmental consequences of coal fired power plant;
- (iv) determine the availability of land for the ultimate capacity of the power stations, dedicated rail route from coal mine to plant site for carrying indigenous coal and river training to protect the plant's embankment erosion;
- (v) examine and propose a detailed coal handling arrangements of coal delivery requirement for proposed plant;
- (vi) identify all technical requirements/ parameters to be specified by the client's required as part of the development of the indigenous coal projects;
- (vii) detail out necessary information for tendering purposes of
 - (a) the coal handling facility,
 - (b) the ash disposal facility, and
 - (c) the new/ additional transmission line facilities (including route)
- (viii) review of literature on interventions of power plant,
- (ix) attend meetings with the client as and when required;
- (x) preparation of the reports at different stages of the study;
- (xi) others as necessary;

9.1.2 Electrical Engineer

Qualification:

- i. He/she shall be at least Bachelor in Electrical Engineering, Master in Electrical/ Mechanical Engineering will carry maximum credit.
- ii. He/she shall have experience in similar nature of works for minimum 8 years. 15 years of experience in similar nature of works will carry maximum credit.
- iii. He/she have must have through knowledge and working experience in power plant. He/ she should have fair idea about the power plant set up. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.



Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) maintain liaison with the team leader,
- (ii) interpret the environmental consequences of coal fired Power Plant,
- (iii) literature review on electrical interventions of power plant;
- (iv) preparation of specifications;
- (v) preparation of cost estimates;
- (vi) attend meeting with team leader as and when required by the client;
- (vii) assist the Team Leader in preparation of the reports at different stages of the study;
- (viii) others as necessary;

9.1.3 Mechanical Engineer

Qualification:

- i. He/she shall be at least Bachelor in Mechanical Engineering; Master in Mechanical Engineering will carry maximum credit.
- ii. He/she shall have experience in similar nature of works for minimum 8 years. 15 years of experience in similar nature of works will carry maximum credit.
- iii. He/she must have through knowledge and working experience about power plant generation procedure by coal based Power Plant. He/she should have fair idea about the power plant set up. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) maintain liaison with the team leader;
- (ii) interpret the environmental consequences of coal fired Power Plant,
- (iii) literature review on metallurgical interventions of power plant;
- (iv) preparation of specifications;
- (v) preparation of cost estimates;
- (vi) assist the Team Leader in preparation of the reports at different stages of the study;
- (vii) attend meeting with team leader as and when required by the client;
- (viii) others as necessary;

9.1.4 River Training Expert

Qualification:

- i. He/she shall be at least Bachelor in Water Resources/ Civil Engineering; Master in relevant field will carry maximum credit.
- ii. He/she shall have experience in similar nature of works for minimum 8 years. 15 years of experience in similar nature of works will carry maximum credit.
- iii. He/she should have the experience about the effective river training scheme to protect the project site embankment from erosion. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) maintain liaison with the team leader,
- (ii) interpret the environmental consequences river training scheme of coal fired Power Plant
- (iii) indicate the effective river training scheme to protect the project site embankment from erosion;
- (iv) literature review on river training scheme;
- (v) preparation of specifications;



- (vi) preparation of cost estimates;
- (vii) assist the Team Leader in preparation of the reports at different stages of the study;
- (viii) attend meeting with team leader as and when required by the client;
- (ix) others as necessary;

9.1.5 Economist / Financial Analyst

Qualification:

- i. He/she should have a Master degree in Economics/ Finance.
- ii. He/she shall have experience of 08 years in similar of works nature. 12 years experience will carry maximum credit.
- iii. (He/she should have experience in Financial Analyst related to Gas infrastructure/ Highway/ Railway/ Power transmission infrastructure/ river or waterway embankment) and on macro and micro economics, regional planning, assessment of economic potentials of regional development plan, formulation of sectorial polices and strategies for Bangladesh. He/she also needs practical experience of working in multi-disciplinary teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) perform pre-feasibility level economic and financial analysis;
- (ii) determine pre-feasibility level cost-benefit ratio and EIRR;
- (iii) examine and evaluate the available data related to the socio-economic condition of the study, magnitude and extents of the people sufferings from the proposed power plant;
- (iv) maintain the link with different interested groups like Tribal People, different NGOs who are working in the study area;
- (v) assist the Team Leader in preparation of the reports at different stages of the study;
- (vi) others as necessary;

9.1.6 Rail Track Construction Expert

Qualification:

- i. He/she should have at least a Bachelor degree in Mechanical/ Civil; Master in relevant field will carry maximum credit.
- ii. He/she shall have experience of 08 years in similar of works nature. 12 years experience will carry maximum credit.
- iii. He/she should have experience of examination and proposing a detailed dedicated rail route, trip schedule to carry indigenous coal from mine to plant site which satisfy the coal delivery requirement for power plant of 2 x 660MW capacity including determining the availability of land for the rail route. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) maintain liaison with the team leader;
- (ii) interpret the environmental consequences of rail route construction to carry indigenous coal;
- (iii) literature review on interventions of transportation of coal from the source;
- (iv) determine the availability of land for the dedicated rail route for indigenous coal transportation;
- (v) prepare layout plan with the design of dedicated rail route for indigenous coal transportation to the power plant area;
- (vi) preparation of specifications;
- (vii) preparation of cost estimates;
- (viii) assist the Team Leader in preparation of the reports at different stages of the study;
- (ix) attend meeting with team leader as and when required by the client;
- (x) others as necessary;




9.1.7 Coal Handling Expert including Coal bunker, stock pile

Qualification:

- i. He/she should have at least a Bachelor degree in Mechanical; Master in relevant field will carry maximum credit.
- ii. He/she shall have experience of 08 years in similar of works nature. 12 years' experience will carry maximum credit.
- iii. He/she should have experience of examination and proposing a detailed coal handling system at the site that will satisfy the coal delivery requirements for power plant of 2 x 660 MW capacity. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) maintain liaison with the team leader;
- (ii) interpret the environmental consequences of coal fired power plant;
- (iii) examine and propose a detailed coal handling system at site that will satisfy the coal supply to the plant as per requirement;
- (iv) Preparation the list of coal handling equipments for clean coal technology;
- (v) Examine and propose coal storage facility as per coal requirement in the Power Plant;
- (vi) preparation of specifications of required coal as per coal handling equipments;
- (vii) preparation of cost estimates;
- (viii) assist the Team Leader in preparation of the reports at different stages of the study;
- (ix) attend meeting with team leader as and when required by the client;
- (x) others as necessary;

9.1.8 Civil Engineer

Qualification:

- i. He/she shall have at least a Bachelor degree in Civil Engineering; Master in relevant field will carry maximum credit.
- ii. He/she shall have experience of 05 years in similar of works nature. 15 years' experience will carry maximum credit
- iii. He/she must have experience of construction and reviewing of literature on interventions of power plant, determining the availability of land for the ultimate capacity of the power stations, the adequacy of water for intake and discharge for cooling system of the proposed project. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) shall maintain liaison with the team leader;
- (ii) guide and co-ordinate all project activities;
- (iii) interpret the environmental consequences of coal fired power plant,
- (iv) review of literature on interventions of power plant,
- (v) determine the availability of land for the ultimate capacity of the power stations;
- (vi) find out the adequacy of water for intake and discharge for cooling system of the proposed project;
- (vii) identify all technical requirements/ parameters to be specified by the client's required as part of the development of the indigenous coal power plant projects;
- (viii) preliminary idea of structural design of different components of the power plant;
- (ix) preparation of specification (if required);
- (x) preparation of cost estimates;
- (xi) assist the Team Leader in preparation of the reports at different stages of the study;
- (xii) attend meetings with the client as and when required.
- (xiii) others as necessary.



9.1.9 Geotechnical Specialist

Qualification:

- i. He/she shall have at least a Bachelor degree in Civil / Water resources engineering / relevant fields; Master in relevant field will carry maximum credit.
- ii. He/she shall have experience of 06 years in similar of works nature. 15 years experience will carry maximum credit.
- iii. He/she must have through knowledge about coal gas infrastructure, energy, transport, urban and/or natural resources management sector in Bangladesh or similar climatic, topographic and socio-economic environment. He/she must have proven records of leading and working with multi-disciplinary team.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) review of literature on interventions of geotechnical and foundation design concerned activities related with the power plant;
- (ii) set up several bore logs in the power plant site to be determined during planning process;
- (iii) analysis of soil characteristics in the power plant site;
- (iv) seismic study;
- (v) foundation design;
- (vi) assist the Team Leader in preparation of the reports at different stages of the study;
- (vii) shall maintain liaison with the team leader;
- (viii) others as necessary;

9.1.10 Hydrology Expert

Qualification:

- i. He/she shall have at least a Bachelor degree in Civil/ Water Resources engineering/ Hydrology/ Hydro Informatics; Master in relevant field will carry maximum credit.
- ii. He/she shall have experience of 05 years in similar of works nature. 12 years experience will carry maximum credit.
- iii. He/she should have through knowledge about the availability of water with suitable depth of the rivers, the navigable routes for transportation of water vessels for carrying heavy machineries & equipments, hydrodynamic models and application of hydrodynamic models etc. He/she must have proven records of leading and working with multi-disciplinary team.

Responsibilities: His/ her tasks and responsibilities shall include but not limited to:

- (i) determine the availability of water with suitable depth of the rivers i.e. the navigable routes for transportation of water vessels for carrying heavy machineries & equipment;
- (ii) specify the factors for the design criteria for land development, foundation and civil design;
- (iii) identify all technical requirements/parameters to be specified by client's requirements;
- (iv) shall have close co-ordinate with all other members of the team for determining the availability of water with suitable depth;
- (v) assist the Team Leader in preparation of the reports at different stages of the study;
- (vi) others as necessary;

9.1.11 GIS, RS and Auto-CAD Specialist

Qualification:

- i. He/she shall have at least a Master degree in Geography/ Geology/ Environmental sciences or Bachelor degree in Civil/ Water Resources.



- ii. Engineering with minimum 5 years working experience in the field of GIS, RS and Auto-CAD. Extensive experience is required with Auto-CAD, ARC/INFO, and Arc View software. He/she must have proven records of leading and working with multi-disciplinary team with 10 years of experience in relevant field will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) prepare all types of maps and drawings required for the study;
- (ii) shall have close co-ordination with all other members of the team for preparation of the maps and drawings of the study;
- (iii) work under the guidance of the Team leader all the activities of GIS and RS data capturing, geo-referencing and other spatial processing;
- (iv) assist the Team Leader in preparation of the reports at different stages of the study;
- (v) Others as necessary;

9.1.12 Environmental Expert

Qualification:

- i. He/she shall be a highly experienced with a Masters with Honors in Geography and Environmental Science/ Master's in Environmental Engineering degree. Additional higher relevant degree will carry maximum credit.
- ii. He/she must have thorough knowledge of at least 05 years in coal based power plant as well as in gas infrastructure, energy, transport, urban and/ or natural resources (air, water, noise, flora/fauna) management sector in Bangladesh or similar climatic, topographic and socio-economic environment. He/she must have proven records of leading and working with multi-disciplinary and multi-cultural teams. 15 years of experience in the relevant field will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) shall maintain liaison with the team leader;
- (ii) guide and co-ordinate all project activities;
- (iii) interpret the environmental consequences of coal fired power plant;
- (iv) assess environmental impacts and mitigation measures;
- (v) prepare IEE Reports;
- (vi) determine the availability of land for the ultimate capacity of the power stations, the ash disposal facility, new/ additional transmission line facilities (including route) and dedicated rail route construction (including route);
- (vii) assess environmental impacts for River training scheme;
- (viii) assess environmental impacts for dedicated rail route construction;
- (ix) review of literature on interventions of power plant;
- (x) attend meetings with the client as and when required;
- (xi) Preparation of the reports at different stages of the study;
- (xii) Communication to DoE for approval the IEE reports;
- (xiii) Designing the EIA & SIA study plan and develop the methodology for undertaking the study;
- (xiv) Contribute in developing environmental management plan including mitigation plan;
- (xv) assist the Team Leader in preparation of the reports at different stages of the study;
- (xvi) Others as necessary;

9.1.13 Morphologist and Water Resources Engineer

Qualification:

- i. He/she shall have at least a Bachelor degree in Civil Engineering/ Water Resource Engineering/ Hydraulic Engineering; Master in the relevant field will carry maximum credit.
- ii. He/she must have thorough knowledge of at least 5 years about power plant planning in all respect, to be generated by coal fired power plant. He/she shall have experience in gas infrastructure, energy, transport, urban and/ or natural resources management sector in Bangladesh or similar climatic, topographic and socio-economic environment. 10 years of experience in the relevant field will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) collecting information on the proposed project and work out the impact of the interventions on the water resources in the project;
- (ii) specify the factors for the design criteria for land development, foundation and civil design;
- (iii) coordinating the activities of the multidisciplinary team members; maintaining liaison with the concerned Government officials for collecting different secondary data like metrological and hydrological data;
- (iv) review and interpreting the water resources consequences of power plant constructions and other water resources management activities; examining, interpreting and interrelating all of the historical hydro-morphological data available for the study area, physical monitoring data collected by IWM (Inland Water Modeling) and BWDB (Bangladesh Water Development Board) in order to understand the physical tidal processes;
- (v) attempting to interrelate the different physical process like the tidal volume sediment concentration, sedimentation process, channel dimensions and salinity in order to develop predictive tools for the study area;
- (vi) monitoring more or frequent physical parameter of river. His/her findings will be included in the baseline surveys, and monitoring report and motivation campaign
- (vii) organizing and attend the workshops, and attend meeting with team leader as and when required by the client;
- (viii) prepare scheme for cooling system and adequacy of water for intake and discharge proposed project
- (ix) assist the Team Leader in preparation of the reports at different stages of the study;
- (x) Others as necessary;

9.1.14 Ecologist

Qualification:

- i. He/she should have Masters with Honors in Ecology/ Biology/ Marine Biology/ Fisheries/ Botany/ Zoology/ Soil Science/ Geography.
- ii. He/she shall have experience in similar nature of works for minimum 5 years. 10 years' experience will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) designing and developing methodology along with collection, completion and analysis of data related to biological resources;
- (ii) establishing baseline condition fisheries and aquatic resources;
- (iii) identifying and assess the possible positive and negative impacts on flora and fauna due to the recommending measures to offset negative impacts and will assist team leader in interpretation of data as well as in preparing the EIA & SIA reports;
- (iv) attending in the meetings with the team leader;
- (v) assist the Team Leader in preparation of the reports at different stages of the study;
- (vi) Others as necessary;



9.1.15 Socio-Economist

Qualification:

- i. He/she should have at least a Bachelor degree/ Equivalent in Social sciences/ Masters in Rural Development.
- ii. He/she should have through knowledge about socio-economic survey, resettlement action plan, etc. He / she must have proven records of leading and working with multi-disciplinary teams for minimum 5 years. 10 years of work experience in the relevant field will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) designing and developing methodology along with collection, compilation and analysis of data related to social and economic activities along the route;
- (ii) establishing baseline condition from socio-economic point of view;
- (iii) identifying and assessing the possible positive and negative impacts in settlements and homesteads due to installation of gas pipeline;
- (iv) preparing and conduct consultation meetings with stakeholders and participate in workshops;
- (v) recommending measures to offset negative impacts and will assist team leader in preparing Environmental Management Plan as well as in preparing the EIA & SIA report;
- (vi) examining and evaluating activities of the field researchers;
- (vii) examining the development of conflicts among the different groups and different localities and provide mitigation measures during the process of implementing the power plant and
- (viii) evaluating the overall social benefits like in poverty alleviation, women participation, health and education.
- (ix) assist the Team Leader in preparation of the reports at different stages of the study;
- (x) Others as necessary;

9.1.16 Fisheries Specialist (Biologist)

Qualification:

- i. He/she should have at least a Masters in Fisheries/ Zoology/ Marine Biology.
- ii. He/she must have through knowledge and working experience about the impact of aquatic organisms by coal fired power plant for minimum 5 years; 10 years' work experience in fisheries sector will carry maximum credit. He/she must have proven records of leading and working with multi-disciplinary teams.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) collecting historical data on fisheries for generating the Future without project (FWOP) condition and compare the same with the Future with project (FWIP) condition for assessing impacts of the proposed coal fired power plant on fisheries;
- (ii) monitoring the impact on fish production and its diversity during the project implementation and suggest possible mitigation measures;
- (iii) suggesting enhancement measures for increasing benefits of the positive impacts in addition to suggesting a fisheries monitoring plan;
- (iv) examining available data on fish production and its diversity in relation with the changes of drainage condition of the project area of power plant;
- (v) assess the environmental impact and mitigation measures and prepare IEE Reports;
- (vi) others as necessary;



9.1.17 Soil & Agricultural Specialist

Qualification:

- i. He/she should have at least a Bachelor degree/ Masters in Agriculture/ Soil Science
- ii. He/she shall have experience in Soil and Agriculture for minimum 5 years . 10 years of experience in the relevant field will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) Establishing baseline condition in respect of land resources and agricultural practice in the project;
- (ii) Collecting of historical data on soil and agriculture for the project, condition and compare the same project condition for assessing impacts of the proposed interventions on land resources and agricultural practices including cropping pattern, agricultural input use and crop production. Selecting IECs related to agriculture and coordinated data collection on the selected IECs;
- (iii) suggesting measures for the mitigation plan, enhancement plan and monitoring plan in respect of land resources and agricultural practices of the rehabilitated schemes;
- (iv) assist the Team Leader in preparation of the reports at different stages of the study;
- (v) Others as necessary;

9.1.18 Chemical Engineer

Qualification:

- i. He/she should have at least a Bachelor degree in Chemical Engineering; Master's in the relevant field will carry maximum credit.
- ii. He/she shall have experience in similar nature work for minimum 5 years. 10 years' experience will carry maximum credit.

Responsibilities: His/her tasks and responsibilities shall include but not limited to:

- (i) investigate the water quality of project area;
- (ii) Develop suitable measures for water treatment as per water quality modeling report ;
- (iii) Prepare specification of required equipment and material for Chemical plant, cooling water system, condensate cooling system;
- (iv) Be responsible for cost-effective conditions in cooperation with the project team;
- (v) Assessment & study and suggesting measures of effluent treatment plant includes technology and equipment as necessary;
- (vi) preparation of specifications;
- (vii) preparation of cost estimates;
- (viii) assist the Team Leader in preparation of the reports at different stages of the study;
- (ix) others as necessary;

