Proposed Ghorashal Unit 4 Repowering Project
Appraisal Mission – August 11-27, 2015

Aide Memoire

1. An appraisal mission[1] for the proposed Ghorashal Unit 4 Repowering Project was carried out from August 11-27, 2015. The main objectives of the mission were to finalize: (i) the institutional and implementation arrangements with specific timeline; ii) detailed project costs, financing plan, and Development Project Proposal (DPP); iii) the timeline and selection arrangements for the key procurement packages, including Owner's Engineer; and iv) other specific activities under the technical assistance component; v) the results framework, including monitoring and evaluation arrangements for the project; vi) financial management action plan and disbursement arrangements; and vii) environmental management monitoring plan. The appraisal team also wanted to confirm gas availability for the project and understand the progress of the power transmission project by PGCB through IDB funded project.

1. The mission met with the officials of the Ministry of Power, Energy and Mineral Resources (MPEMR), Bangladesh Power Development Board (BPDB), Petrobangla (PB), Power Grid Company of Bangladesh (PGCB) and Economic Relations Department (ERD). The team congratulated BPDB for the successful launching of the bid documents of the key contract under the project. The team also wishes to express its deep appreciation to the Power Division, BPDB, PGCB, PB, ERD and others for the productive discussions and excellent cooperation during the mission. The findings of the aide memoire (AM) have been discussed during the wrap-up meeting that was chaired by the Secretary, Power Division and held on August 27, 2015. A list of officials met during the mission appears in Annex 1.

2. **Key Progresses of Project Preparation:**

i) Bid documents for the EPC contract launched on 3rd July 2015; Pre-bid meeting held on 5th August 2015;
ii) Procurement Panel members for bid evaluation are hired by Power Cell;
iii) Draft Development Project Proposal (DPP) is prepared and is being reviewed by the Ministry;
iv) Ghorashal Power Station has been declared as SBU from July 1, 2015 and financial power delegated to SBU Board and CEO of SBU following BPDB's financial power delegation manual;
v) REOI for Owner's Engineer (OE) published on 18th August 2015;
vi) A global independent procurement expert has been identified by BPDB and is being hired to be part of the EOI and proposal evaluation committee of the OE.
vii) Revised Results Framework has been agreed.

3. **Time Extension for EPC Bid Submission:** During the pre-bid discussion of the EPC bid documents held on 5th August 2015, there were few requests to extend the time for the bid submission. BPDB was initially reluctant to grant any time extension. The mission requested BPDB to review their stand on the extension so that no extension doesn't result in a situation where the bidder numbers are too low. At the wrap up meeting, this issue was discussed again and two weeks extension was agreed. BPDB has already issued the amendment in this regard. This extension necessitated the revision of the Bank Board date in order to ensure that the evaluation of the EPC bids is complete before project Negotiation. The revised Board date now is 17th December 2015.

4. The mission also discussed the urgency of the issuance of the clarification to bidders' queries

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as soon as possible upon receiving Bank's concurrence. A few amendments to bid documents have also been agreed that needed to be published at the same time. BPDB issued and published all the amendments and clarifications in its website on 2nd September 2015.

5. **Owner's Engineer (OE)**: BPDB will recruit a globally qualified consulting engineer to act as 'Owner's Engineer' (OE) during the construction of the power plant to be financed from the TA component of the project. OE will review design and drawing, supervise construction and commissioning of the power plant and provide necessary quality assurance during design, manufacture, construction and commissioning of the plant. The mission noted that the process to hire Owner's Engineer could have been advanced further aligning the progress of the hiring of the EPC contractor. Both BPDB and the mission realize the importance of hiring the OE prior to the start of EPC work. Accordingly, a timeline has been agreed to advance the OE hiring process and the mission requested BPDB to strictly follow the agreed timeline. The agreed timeline has been attached in Annex 6.

6. The mission also discussed about the inclusion of a global independent procurement expert to be included in the bid evaluation committee for hiring of the OE. BPDB requested for reference CVs which the Bank team has provided. BPDB has already identified the independent member and requested Power Cell for recruitment. The mission suggested to expedite the recruitment process so that the independent member can be on board for evaluation of the EOIs due to be received on Sep 10, 2015.

7. **Implementation Arrangement of the project**: The mission appreciated the proactive roles of BPDB and Ministry of Power Energy and Mineral Resources for declaring the Ghorashal power plant a SBU from July 1, 2015 through an official order, and for approving the delegation of financial power to the SBU Board and its CEO. The next step would be to institutionalize the SBU structure; finalize the Power Purchase Agreement (PPA) with BPDB; and formation of an Audit Committee. The mission was informed that drafting of the PPA would be complete by 30 September 2015. The mission emphasized the importance of conducting regular SBU Board meetings so that progress in implementing the agreed actions can be tracked and more decisions in SBU Board are taken for full functioning of the SBU.

8. The mission discussed the implementation arrangement of the project. BPDB has formed a project management unit (PMU). PMU will soon include one Financial Management specialist and Environmental focal point who may be assigned from Ghorashal O&M team. It was agreed that both these recruitments need to be completed by 30 November 2015 at the latest. The PMU has actively participated in the preparation of bidding document for the design, supply, installation and commissioning of the power plant and will be responsible for the supervision of construction of the power plant. The OE will support PMU in implementation of the EPC contract. The OE will directly report to the PMU.

9. During implementation, the OE will certify EPC's invoices and participate in progress review and coordination meetings. The PMU will closely coordinate with the SBU on logistics, security, and site hand over etc. A representative from the Ghorasal SBU will participate in the coordination meetings that will be arranged by the PMU. After completion of the power plant installation works, commissioning and start up phases will start. At this point, the PMU will form a commissioning team comprising engineers of the Ghorasal SBU. The team will participate in the commissioning works. The team will work together with the OE, EPC and PMU during the commissioning and hand over phases. Upon achievement of the commercial operations date (COD), the power plant will be handed over to the SBU that will assume operation and maintenance responsibilities of the power plant.

10. **Detailed Project Costs and DPP:** The mission noted that the cost of the component A (repowering) of the project would be known before project negotiation and accordingly the Bank's Project Appraisal Document would be revised for Bank Board's consideration. Development Project Proposal (DPP) of the project has considered project cost based on what was received for Unit 3 that

has been awarded to an EPC contractor. However, there is a strong expectation that the cost of the Unit 4 repowering would be less due to competition.

11. The estimated cost of the project, including taxes, is about $300 million, of which IDA financing is proposed to cover goods, works and technical assistance support amounting to $235 million (Annex 3). The rest will come from the GOB contribution that will finance taxes and duties on equipment and civil works and project management costs (excluding consultants and training). Accordingly, it was agreed at the wrap up that the DPP needs to be revised to reflect these costs before submission to the Planning Commission for PEC.

12. The Project DPP is currently being reviewed at the Power Division of the Ministry. The mission informed the government that the project Negotiation which is currently scheduled in mid-November 2015 would require PEC meeting on the DPP to be completed. At the wrap up meeting, the chair asked his ministry officials to ensure that the timeline is met.

13. **Technical Assistance (TA) Support.** The key TA support under the project would be provided for the hiring of Owner's Engineer for which US$3.5 million would be allocated as agreed. The allocation would be further reassessed once the TOR for OE is finalized. A detailed list of capacity building and system improvement activities has been discussed and agreed with BPDB. Accordingly, BPDB would provide to the Bank an estimate of such TA support so that the cost of the TA component can be finalized. The activities under the TA support will be part of the Project Appraisal Document (PAD). The mission agreed that the TA support for capacity building will not be limited to Ghorashal/Project staff but would also cover BPDB staff in general. The mission was informed that the emphasis would be given on local training (by local/foreign trainer) and then select participants carefully for foreign training.

14. **Gas Availability for Unit 4:** The mission team had raised concern for gas availability for Unit 4 (to be repowered under the project) as Unit 7 (new combined cycle power plant) is being developed in the Ghorashal hub. Earlier, the Bank team was assured of required gas for Unit 4 for any incremental need beyond the current consumption level. The government also committed to retire unit 1 and 2 which would release additional gas and would suffice the requirement for Unit 4 after repowering. The team was informed during the mission that the requirement of Unit 7 would be met through additional allocation of gas to Ghorashal by Petrobangla. The mission also met Petrobangla officials and understood that there was no real commitment to allocate gas for Unit 7 until there is improvement in the overall gas supply scenario. The total gas allocation by TITAS for Ghorashal power station is 240 mmcfd for its 6 units and they would continue to supply this amount of gas to Ghorashal. Therefore, the mission emphasized the need for prioritization of gas allocation within Ghorashal and reassurance of required gas availability for Unit 4 by BPDB management. At the wrap up meeting, both the Chair and BPDB senior management committed that the required gas for Unit 4 would be ensured as a priority. BPDB is also committed to provide a written note in this regard before project Negotiation.

15. **Power Transmission work by PGCB:** The mission was informed by PGCB that there is already delay in awarding the contract for the IDB financed project to strengthen the power transmission network. This transmission line from Ghorashal to Tongi under that project is essential to meet the requirement of line capacity for the enhanced power transmission after the repowering of Ghorashal units. The current progress reveals that there could be a period of 3-6 months when the gas turbine under the proposed repowering of Unit 4 project may not be able to transmit power as the transmission line would not be ready (provided the proposed project progresses on track). The mission requested PGCB to expedite the current progress so that such situation can be avoided and it was agreed that BPDB management would follow up with PGCB.

16. **Results Framework and monitoring and evaluation arrangement:** The mission discussed the requirement of the incorporation of the core sector indicators in the results framework (RF) as per the Bank guideline. Accordingly, the PDO indicators in the RF have been revised. The intermediate

results indicators were also revised to measure interim progress during implementation. The revised results framework has been attached in Annex 2.

17. The mission discussed the modality of the periodic evaluation of the project that will be carried out during project implementation. Data acquired through quarterly progress reports of PMU/BPDB will be used to monitor the project performance. The monthly reports from the OE will also be shared with the Bank implementation support team. The task team will field three missions a year when they will also review the progress of the construction works of the power plant and rate the project performance in each mission. The Bank team will also periodically monitor the progress of SBU operationalization and performance of SBU through a set of KPIs that SBU has agreed with BPDB and the Ministry.

18. **Financial Management (FM).** The mission discussed the FM capacity assessment that was carried out by the Bank's FM team to evaluate the overall FM environment prevalent within BPDB. The team assessed the prevailing risks at the implementing agency level and also identified the FM arrangements that would be needed to meet the fiduciary requirements of the World Bank. Fiduciary risk mitigation measures were also agreed with the agency along with a FM action plan (para 22).

19. The mission agreed to provide adequate support from the project's TA component to improve the overall reporting arrangement of BPDB which is currently being done manually. Capacity building needs were also discussed. The mission suggested and BPDB agreed that a FM specialist be hired to support PMU in dealing with the FM matters of the project.

20. **Environmental Safeguard:** The Environmental Management Plan (EMP) implementation plan for the project was discussed during the mission. The PMU will be in charge of implementing the EMP. In order to augment capacity of BPDB in the environmental management areas and regular monitoring of the EMP, OE to be hired for the project will include relevant environment experts. The OE will supervise the implementation of the boiler decommissioning, EPC contractor's activities involved in civil works, erection of turbine and HRSG and other requirements under the EMP.

21. As per ESIA, BPDB will set up a team, led by an Executive Engineer with specific responsibility to oversee the EMP implementation activities including those of owner's engineer. The mission emphasized the need for this team to be in place prior to the start of project implementation. As the ESIA includes environmental monitoring programs for both construction and operation phases; this team will continue its activities in the operation phase also. Provision for hiring of an EHS Consultant is included under EMP to support this unit. The mission discussed the staffing and consultant provision with BPDB. It was agreed that all the required staff and consultant will be on board by November, 2015. A national level consultation workshop on draft ESIA will also be organized by BPDB with the assistance of the ESIA consulting firm by September 10, 2015. In addition, BPDB has confirmed that the government project document will include all environmental management cost as per the ESIA provision. It was also agreed that amended Bid document will include the relevant items mentioned in the ESIA including Continuous Air Quality Monitoring System.

22. **Proposed Key Timeline for Processing.**

Appraisal by Bank	15 September 2015
PEC Meeting[2]	30 September 2015
Negotiation	15 November 2015
Bank Board Approval	17 December 2015
ECNEC Approval	December 2015

[2] Completion of PEC meeting is a pre-condition by ERD to Negotiation

23. **Key Agreed Actions:** Following key actions were agreed during the mission and at the wrap up meeting. These actions will be followed up by the Ministry on a regular basis.

Agreed Actions	**Due Dates**	**Responsibilities**
EPC Bid Documents		
Clarifications and amendment to the bid document to be published	30 August 2015	BPDB
Approval of DPP by Ministry	15 September 2015	Ministry
Owner's Engineer (OE)		
Hiring of the Independent procurement expert for the OE evaluation committee.	05 September 2015	BPDB & Power Cell
Finalize RFP for OE	15 September 2015	BPDB & WB
Complete proposal evaluation	15 January 2016	BPDB
Complete Contract negotiation	15 April, 2016	
Ghorashal SBU		
Power Purchase Agreement (PPA) signed between Ghorashal SBU and BPDB	31 October, 2015	CEO, Ghorashal
Environmental Safeguard		
Assigning/hiring of required staff and individual consultant for environmental management	30 November 2015	BPDB
Organizing national level consultation/disclosure workshop	10 September 2015	BPDB and Consulting Firm
Inclusion of relevant items of ESIA including Continuous Air Quality Monitoring Station in the amended Bidding Document	30 August 2015	BPDB
Financial Management		
Preparation of ToR for the "*Accounting System Specialist (ASS)*" and share the same with the Bank for its concurrence	15 September 2015	BPDB/WB
Completion of hiring process of Accounting System Specialist	15 November 2015	BPDB
Preparation and sharing draft FM Manual to the Bank for its concurrence	15 October 2015	BPDB
Final Draft of FM manual agreed with Bank	15 November 2015	BPDB
Deputation of Deputy/Assistant Director-Accounts and 2 accounting staff under PMU	28 February 2016	BPDB
Preparation and sending the ToR of FM consultant (FMC) to the Bank for its concurrence	10 October 2015	BPDB/WB
Sharing the Evaluation Committee Report of FMC for the Bank's concurrence	15 November 2015	BPDB
Completion of hiring process of FMC	30 November 2015	BPDB
Procurement of off the shelf accounting software	31 December 2015	BPDB

Annex 1

List of Officials Met

Ministry of Power, Energy and Mineral resources (MPEMR)

1. Mr. Monowar Islam, ndc, Secretary, Power Division
2. Mr. Anwar Hossain, Joint Secretary, Power Division
3. Mr. Mokhlesur Rahman, Senior Assistant Chief

Bangladesh Power Development Board (BPDB)

1. Mr. K.M. Hassan, Chairman, BPDB
2. Mr. A.T.M Zahirul Islam Majumder, Member (Planning and Development)
3. Mr. Md. Mizanur Rahman, Chief Engineer (Planning and Development)
4. Mr. Khaled Mahmud, Chief Engineer (Generation)
5. Mr. Lutfar Rahman, Financial Controller
6. Mr. Md. Sayeed Ahmed, Director (System Planning)
7. Mr. Md. Shah Nawaz, Project Director

Economic Relations Division, Ministry of Finance

1. Mr. Md Shofiqul Azam, Additional Secretary, ERD
2. Mr. Md. Anwar Hossain, Deputy Secretary, ERD

Power Cell

1. Mr. Mohammad Hossain, Director General
2. Mr. Mosaddek, Director (Technical)

Petrobangla

1. Mr. Jamil Ahmed Alim, Director (Operations)

PGCB

Mr. Arun Kumar Saha, Director, Project Design

Annex 2: Results Framework and Monitoring

Project Development Objectives												
The development objective of the Project is to increase generation supply and efficiency												
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Project Development Objective Indicators												
				Cumulative Target Values							**Data Source/**	**Responsibility for**
Indicator Name	**Core**	**Unit of Measure**	**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**	**YR6**	**Frequency**	**Methodology**	**Data Collection**
Generation capacity constructed under the project	Y	MW	180	180	180	235	400	400	400	Quarterly	BPDB MIS Report and Project Progress report	BPDB
Projected lifetime fuel savings	Y	MMCFT/GWh	11.99	11.99	11.99	10.58	6.66	6.66	6.66	Quarterly	BPDB MIS Report and Project Progress report	BPDB
Efficiency of the unit measured by gas consumption per GWh output		%	30%	30%	30%	34%	53%	53%	53%	Quarterly	BPDB MIS Report and Project Progress report	BPDB
Intermediate Results Indicators												
Indicator Name	Core	Unit of Measure	Baseline	YR1	YR2	YR3	YR4	YR5	YR6	Frequency	Methodology	Data Collection

Commissioning of Gas Turbine completed		Text	Not Commissioned		GT commissioned	GT operation started				Quarterly	BPDB MIS Report and Project Progress report	BPDB
Overhauling of existing Steam Turbine Generator completed		Text	Not overhauled		HRSG installed	STG overhauled; Boiler dismantled	CC operation started			Quarterly	BPDB MIS Report and Project Progress report	BPDB
Strategic Business Unit (SBU) fully functional		Text	Partially functional: Bank account opened; financial power delegated; KPIs signed	PPA signed	Functional	Functional	Functional	Functional	Functional	Quarterly	BPDB MIS Report and Project Progress report	BPDB
Environment and Social Management Unit operational at Ghorashal		Text	Not operational	Focal point assigned	Focal point assigned	Focal point assigned	ESM Unit operational	ESM Unit operational	ESM Unit operational	Quarterly	BPDB MIS Report and Project Progress report	BPDB
GHG emissions		CO2 tons/	673	673	673	593	374	374	374	Quarterly	BPDB MIS Report and Project Progress report	BPDB

Annex 3: Detailed Project Cost to be Financed by IDA (in USD Million)

	Description	Cost
Plant and Equipment		**161**
1	New Gas Turbine with Generator	75
2	New HRSG	30
3	New excitation system for STG	2
4	Full and complete overhaul of the generator of the steam turbine	8
5	GT Step up Transformer	5
6	Station Service Switch gear (40 MVA capacity)	5
7	Communication System	2
8	Renew of MV, LV, Switchgear, control and cables	5
9	Central DC power source with UPS having double charger for the Unit 4	2
10	Complete Replacement of piping, valves, pumps, instrumentation, etc. BOP (Balance of Plant).	5
11	Gas boosters and associated equipment including piping to connect to the existing RMS	5
12	Main stack	1
13	Bypass Stack	2
14	The new DCS system.	2
15	Hookup and cables to connect to new GIS S/S	1
16	Workshop facilities (Mechanical/Electrical/I&C)	2
17	Emergency Diesel Generator (2MW) set	2
18	Boiler Dismnatling and removal	3
19	Mandatory Spare parts	5
Common Mechanical Works at GPS		**11**
20	Fire Fighting System (FFS) in the whole Ghorashal Power Plant hub should be installed.	2
21	Central compressed air plant	1
22	New Demi water plant	4
23	Common Hydrogen plant	1
24	Closed Cooling Water (CCW) system	2
25	Central Air Conditioning system covering control room, relay room, computer room, etc	1
Design Services		3
Installation (Erection & Commissioning) and other Services		**30**
Total		**205**
Contingency (Physical 5% and Price 3%)		20
Total Estimated Cost for Repowering		**225**
Technical Assistance (TA)		**10**
Total Project Cost		**235**

Annex 4: Appraisal Summary of Fiduciary Arrangement

Financial Management Capacity Assessment:

1. A FM capacity assessment was carried out to evaluate the overall FM environment prevalent in the country and within the implementing agency, that is, the BPDB. The assessment has assessed the prevailing risks at the implementing agency level and also identified the FM arrangements that will be needed to meet the fiduciary requirements in accordance with institutional requirement of the World Bank. Fiduciary risk mitigation measures were also agreed with the agency along with a FM action plan. Financial Management risk is ***"substantial"*** mainly because of having only a small number of professionally qualified finance and accounting staff with limited or no experience in handling the Bank funded projects and absence of a robust accounting software to account for and report on such a huge project. Also, there is an inadequate number of internal audit staffing within the organization and they lack in modern audit tools and techniques.

2. Financial Controller (FC) of BPDB supervises almost 120 accounts and finance staff and the FC reports directly to the Member (Finance) of the board. There are 5-6 professionally qualified accountants in different layer of the management. The accounting and reporting functions of the project will mainly be handled by Regional Accounting Office in Ghorashal. There is a Regional Accounting Office (RAO) headed by a Deputy Director in Ghorashal in order for accounting and reporting purposes on all regular expenditures, except for development projects. A total of 4 officers and 14 accountants exists in this office at this point in time. Organization and Method (O&M) unit of BWDB decides on deputation of required staffs to development projects from BWDB head office on a case by case basis.

3. *Capacity building through establishment of Accounting and Asset Management Software:* The financial statements are prepared using spreadsheet while books of accounts are maintained manually. Manual book keeping and reporting inherently has several shortcomings including risks of errors and omissions. Also, it has been a big challenge to manage stock and stores in Ghorashal without a proper digital solution in inventory management system. Many hundreds of items are procured and stored for future uses but due to unavailability of a proper tracking mechanism, it becomes extremely difficult to find these when required. Also, there are challenges in terms of advance tracking, house building and short term loan accounting, work flow management on top of preparing an accurate and timely financial statements according to international reporting standards. Therefore, in order to strengthen the financial management capacity, the higher management of BWDB agreed with the Association that an accounting and stock management solution will be procured under the project on a pilot basis, which can be rolled out to all RAO on step by step basis. Initially, there is a requirement of a software with around 30 users along with hardware's. An implementation committee will be formed by the Board for smother implementation of the software. Training sessions will be conducted by the supplier of the software to train the trainers first so that the trainers can carry out the training as or when required for all staff.

Planning and Budgeting

4. *Budgeting:* A budget will be maintained for the entire term of the project, and detailed budgets for each fiscal year will also be produced to provide a framework for financial management purposes. The annual budget will be prepared on the basis of the procurement plan and any other relevant annual work plans. These budgets will be monitored periodically to ensure actual expenditures are in line with the budgets, and to provide input for necessary revisions.

Internal Control

5. *Filing and Record-Keeping*: PMU under BWDB will preserve all accounting records and these records must be made readily available on request for audit/investigation/review by Government and the Bank. All project related documents must be filed separately to facilitate internal and external audits, as well as fiduciary reviews may be carried out by the Bank. The project will maintain assets tracking system for ensuring annual physical verification and reporting on assets procured under the project.

6. *Financial Management Manual:* There is no operational and financial management manual in BPDB to support the fiduciary requirement of development project. It was therefore agreed that the project will prepare a FM manual. The manual will have reference to the *FM Guidebook* which the Bank has prepared to facilitate implementing agencies to execute project expenditure in accordance with applicable country financial rules and regulations of the government and Bank's fiduciary requirements. The FM manual will be ready by November 15, 2015.

7. *Financial Management System:* In order for BPDB to maintain its accounting and reporting for the project expenses, an off the shelf accounting software will be procured under the project. This software will be used to account for project expenses until the SBU wide accounting software is established and implemented as part of this project.

8. *Payments:* All project payments will be made by the PD in the PMU using the banking system (except for small petty cash payments), however, the operating cost will exclude salaries, per diem, allowances and honorarium of officials of the Recipient's civil service and/or other sitting allowances and honorarium of any other nature.

9. *Internal Audit:* Under the Member (Finance) of the board, there is a Director responsible for carrying out the Internal Audit Function of the board. However, it was noted that there is capacity constraint in performing the IA function in compliance with international standards. The project will look into ways to provide support to the Internal Audit Department, especially through training. However, an accounting firm will need to be hired by the project to conduct Internal audit of the project once at the end of 2nd year of implementation and another just one year before the closure of the project. ToR of the internal audit will be prepared by the project as soon as the project declared effective and same will be shared with the Bank for its concurrence. The key internal audit function will be (a) ascertaining whether the system of internal checks and controls operating within the organization for preventing errors and fraud and corruption is effective in design as well as in operation. (b) ascertaining reliability of accounting and other records as well as seeing that accounting methods provide the information necessary for preparation of correct financial statements (c) ascertaining the extent to which the project entity's assets are safeguarded from any unauthorized use or loses (D) Ascertaining whether administrative and financial regulations of the government and instructions issued by the Treasury as well as donors legal requirement are followed.

Oversight Arrangements

10. *External Audit:* The annual accounts of the BPDB is audited by a private audit firm as per statutory requirement. It was agreed that the project audit will also be covered by the same audit, provided the TOR is expanded to reflect this. It agreed that necessary changes in the ToR will be made before the close of each financial year. Annual audit report will be submitted to the Bank by December 31 each year which will be monitored and tracked in the Bank system.

11. *Audit Committee:* There is no audit committee at the BPDB which is essential to advice and monitor management action on audit and its resolution in a timely manner. Options will be explored for forming such audit committee at the entity level (BPDB or SBU) once the proposed organizational structure of SBU is finalized. In the meantime, it was agreed that a team will be established at the PMU level to respond to audit issues and facilitate settlement in a systematic manner. The team will comprise PD, Director Accounts and Director Audit of BPDB under an agreed TOR. The senior most in terms of position will head the team which will meet on a quarterly basis and provide update to the Bank. It was agreed that the project will share the TOR and communicate the formation of the team within three months of project effectiveness.

Financial Management Considerations in the Fiduciary Assessment

12. *Staffing:* PD of the project will have financial power to approve financial transactions of the project. However, an Assistant Director (AD) from finance department of BPDB will be deputed to help PD on financial management issues including 2 to 3 other accounting staffs. PD also works as the drawing and disbursement officer of the project. However, BPDB will hire a professionally qualified accountant from the Market as Financial Management Specialist to help the project in terms of accounting, auditing and financial reporting. BPDB shall identify probable FM staff before the negotiation of the project so that there is no delay in placing them as soon as the project gets effective.

13. *Basis of Disbursements:* It was agreed that the project would start with transaction based disbursements and may convert to IUFR based disbursement when the project demonstrate capacity to prepare reliable and timely financial reports during implementation.

14. *Flow of funds and Designated Account (DA):* Funds will be disbursed through a single Designated Account to be established within the PMU for the Project in the form of Convertible Taka Special Account (CONTASA), to be opened in a branch of a commercial bank acceptable to the Bank. The Commercial Bank will have adequate experience, manpower, network and authority to process transactions on a fast track basis. The approved Government procedures governing the establishment of Designated Accounts shall be followed in all respects. Direct payment method would also be allowed to process large payments to the contractors/ consultants, particularly those in foreign currency to avoid exchange loss. Replenishment to designated account and documentation of expenditures made from the DA will be done on a monthly basis upon submission of claims along with Statement of Expenditures (SoE)/ full documentation following thresholds to be indicated in the Disbursement letter (DL). The ceiling on the advance to DA will be set at 4 months of estimated average project expenditures. All payments to eligible vendors and individuals will be made through the Banking system (no cash payments eligible for IDA financing).

15. *Accounting and Financial Reporting:* All payments of the project will be made centrally from the designated account and there will be no separate operational account opened for this project. The project will provide quarterly unaudited financial reports (IUFR) within 45 days from the end of each quarter. The reporting format will be agreed during the negotiation of the project.

Annex 5: Appraisal Summary of Environmental Safeguard

1. The project is classified as a "Category A" project, due to the complexity of environmental issues associated with project activities involving major civil works by repowering and decommissioning of existing boilers. The WB safeguard policy OP4.01 on Environmental Assessment is triggered in this project. BPDB has carried out the Environmental and Social Impact Assessment (ESIA). The document has 5 volumes: (i) Volume 1- Executive Summary; (ii) Volume 2- Main Report; (iii) Volume 3-Boiler Decommissioning Plan; (iv) Volume 4-Occupational Health and Safety Plan; and (v) Volume 5-Emergency Response Plan. The draft volumes are reviewed and disclosed in-country (www.**bpdb**.gov.**bd**) and the Bank's Infoshop on July 23, 2015 and July 24, 2015 respectively.

2. In the ESIA document, the Environmental Management Plans (EMP) have been provided for different phases of the project. During the construction phase, these measures are included the bidding document and the cost of EMP implementation will form a part of the project cost. The ESIA report is a referral document for the bidding document. The winning EPC Contractor will submit an Environmental Action Plan (EAP) based on the ESIA and the offered plant and equipment, construction method and work schedule. The EAP will be approved by BPDB and the WB before the commencement of the work. The implementation of the mitigation measures, including environmental, health and safety obligations during construction, will be monitored in accordance with a program of monitoring.

3. **Applicable Environmental Category and Safeguard Policies.** The project is classified as a "Category A" project, due to the complexity of environmental issues associated with project activities involving major civil works by repowering and decommissioning of existing boilers. The project is located in a 40-year old industrial complex with seven power plants in operation, therefore natural habitats will not be impacted and no forestry issues are involved. All project activities will be carried out within the boundary of the industrial complex. Therefore, apart from the umbrella policy of "OP/BP 4.01: Environmental Assessment", no other environmental safeguard policies have been triggered for this project. In addition to the compliance of the World Bank safeguard policies/guidelines, the project will also comply with all environmental legislations of the Government of Bangladesh particularly the provisions of Environmental Conservation Act (ECA) 1995 (and its amendments), and applicable Environmental Conservation Rules (ECR) 1997. The relevant Environmental, Health and Safety Guidelines 2007 and Environmental, Health, and Safety Guidelines for Thermal Power Plants, 2008 of the World Bank Group will also be applicable to the project. Moreover, since the scope of work will include handling of hazardous materials such as Asbestos during boiler decommissioning, World Bank Asbestos Guidance Notes (2009) and other international best practices for Asbestos handling will also be applicable.

4. **Environment Impact.** The repowering project activities will have diversified impacts on the environment and socio-economy with various natures and magnitudes. Among the impacts from the proposed activities, some are temporary in nature and limited to pre-construction and construction period, and others are permanent in nature during the operation period. Based on the experience of other similar power generation projects, many of the environmental issues are mainstreamed in the project design (e.g., minimize NOx emission by using low NOx burner, lower the relative water requirement for condenser cooling and minimize thermal plume using closed-cycle cooling, decrease specific-relative fuel requirement, etc.). Generation of hazardous waste (~50 tonnes of Asbestos containing material) during decommissioning of existing boiler, Inhalation of airborne asbestos fiber during boiler decommissioning

activities, elevated noise level from the operation of heavy equipment, felling of trees during site preparation, and labor camp induced sanitation and social stress are the significant impacts of the construction works. Around 30 small wooden trees and bushes will be cut. However, the impact will be short-term in nature as the vegetation will be restored in course of time as a result of the proposed plantation program. Simulation of air quality parameters using emissions from the proposed and surrounding power plants show that the repowering project will have a beneficial impact of decreasing the NO_2 concentration in the ambient air and also decreases of CO and particulate matter.

5. A cumulative impact assessment including all emission sources around the power plant within a 50kmx50 km grid showed that predicted maximum ground level concentrations of NO_2, $PM_{2.5}$ and PM_{10} exceed the Bangladesh standards and WHO guidelines. The high predicted NO_2 concentrations are due primarily to the Aggreko Power plant – which has stacks of insufficient height to adequately disperse emissions. The high $PM_{2.5}$ and PM_{10} concentrations are primarily caused by heavily congested roads and highways and occur far from the project site (28 km away). Due to repowering of unit-4, there will be significant reduction in emissions from the baseline for the Ghorashal power station. After repowering, the modeling result shows that NO_x, $PM_{2.5}$ and PM_{10} emissions from GPS Unit -4 will decrease by 810 tons/yr (13%), 113 tons/yr (41%) and 62 tons/yr (23%), respectively. Noise modeling showed that the operation of the power plant will alter the existing noise environment with several selected receptors experiencing noise in excess of the national standards. However, with appropriate mitigation measures (suggested in the EMP) the adverse effect of noise can be minimized/eliminated. Water quality prediction using a mixing zone model showed that due to repowering (i.e. conversion to a closed cycle cooling from an open-cycle cooling system) there will also be a reduction in the extent of thermal plume in Sitalakhya river that is currently being generated by the GPS units. Reduction in thermal plume in Shitalakhya River may facilitate in restoring habitats of fish species and generating habitat for others aquatic organisms along with benthic habitats. It is expected that due to repowering of Unit 4, there will be a major change in water requirements from Sitalakhya River for the plant. The current water requirement for the cooling water system for unit-4 is 7.6389 m^3/s which will be reduced to 0.38194 m^3/s as a result of conversion to a closed cycle cooling. Hydrazine which is a toxic substance currently used for deoxygenation of water will be eliminated in the new plant.

6. The benefits of the repowering project was also assessed in terms of the reduction of greenhouse gases. It is estimated that 1,439,264 ton/yr of CO_2 emission generates from the baseline scenario (steam cycle) and 901,868 ton/y of CO_2 emission produced from the repowering case for the equal amount of power (412 MW), respectively. The net CO_2 emission benefit is estimated as 537,396 ton/y and a total of 13,434,904 ton in the entire project life (25 years). The overall positive impact of the project during operation is the augmentation of the generation capacity of the electricity and improving the socio-economic condition and lifestyle of the country's population.

7. **Environmental Management Plan:** Environmental Management Plan (EMP) has been prepared for different phases for the mitigation and monitoring of activities involved. The Environmental Management Plan (EMP) includes several plans for implementing mitigation and enhancement measures, emergency response, occupational health and safety, and Environmental Code of Practices. Generally, the impacts, which are minor or moderate, are to be mitigated by adopting Environmental Code of Practices (ECP), and Contractor's good practices during project implementation. On the other hand, impacts and risks which are critical or major will be mitigated or prevented by adopting certain mitigation measures discussed in the EMP. The contractors need to prepare site specific construction management plans to address various environmental issues and to demonstrate the manner in which the Contractor will comply with the requirements of ECPs and EMP. It will be reviewed and approved by BPDB before implementation of construction works. One of the major components of the proposed repowering is decommissioning of the existing boiler. Since Asbestos Containing Materials (ACM) are available in the insulation material of the boiler and associated steam pipelines, the environmental safeguard including

control of asbestos contamination has to be ensured. A detail Plan of boiler decommissioning, asbestos handling and safety operation has been prepared and provided in the Boiler Decommissioning Plan. The general principle on which the boiler decommissioning plan is based on is safe disposal of asbestos containing material and safety procedures while handling asbestos. As there is no specific site for ACM disposal in the country, the EMP has proposed for the construction of an ACM disposal pit within the GPS campus for which conceptual design has also been provided. An Emergency Response Plan (ERP) is prepared which outlines the framework of Emergency Response Strategy which will be followed by the contractor's, operation and maintenance staffs of BPDB during decommissioning, construction, and erection and operation and maintenance phases. A Risk Assessment and Management Plan has also been prepared to account for specific hazards during boiler decommissioning and natural gas leakage. Further to that, the winning Erection, Procurement and Commissioning (EPC) Contractor will submit an Environmental Action Plan (EAP) based on the EIA and the offered plant and equipment, construction method and work schedule. The EAP will be approved by BPDB and the WB before the commencement of the work.

8. In order to make the Contractors fully aware of the implications of the EMP and responsible for ensuring compliance, technical specifications in the tender documents will include compliance with mitigation measures proposed in the EIA as well as World Bank Group's General Environmental Health and Safety Guidelines. The Contractor must be made accountable through contract documents for the obligations regarding the environmental and social components of the project.

9. **Borrower's capacity on environmental safeguard.** The Project Management Unit (PMU) of Bangladesh Power Development Board (BPDB) will be in charge of implementing the Environmental Management Plan. Although BPDB has not implemented any recent project with the World Bank, it has undertaken projects funded by external development partners that require management of environmental issues. BPDB is fully aware about the Bank requirement of environmental and social assessment of the project. However, BPDB currently has only a rudimentary institutional capacity for environmental management. Presently, the Ghorashal Power Station has four circles which are Operation, Mechanical Maintenance, Electrical Maintenance and Civil. Currently there is no dedicated Environment, Health, and Safety (EHS) Circle to address environmental management and occupational health and safety issues. GPS has no staff with previous experience in implementing environmental management and monitoring plan. A proposal has been made to create an EHS and Utility Services (EHSUS) Circle headed by a manager and two deputy managers, one for environment and one for health and safety. One EHS consultant is also proposed under the manager of this circle to advise the circle on environmental, health, and safety issues.

10. Members of the EHSUS Circle responsible for supervision of environmental mitigation measures would be trained in environmental management, environmental quality control, ecology, environmental awareness, participatory approach and occupational health and safety. The contractor will also be required to provide environmental and health and safety trainings to its staff, to ensure effective implementation of the EMP. Budgetary allocations have been made for training and capacity building of PMU and GPS staff.

11. **Grievance Redress:** A project level grievance redress committee (GRC) will be established for the project with the Manager of EHSU Circle as the convener and Ward Councilor as the member secretary. The other members of the Committee could be the representatives of the community, Owner's Engineer, contractors plus any other major stakeholder group. The claims and complaints will need to be brought to the attention of the Ward Councilor. They will then forward grievances to the higher levels of authorities as desired.

12. **Public Consultation:** Public consultation has been carried out adequately at the early stages of the

EA process through informal discussions, focus group discussions and expert interviews. The local people stated that they have no objection about the proposed project and stated that it will bring immense benefit both for the local and national level by means of electricity generation. During the consultations, the affected people and the local communities expressed support for the Project as they saw the benefit to the community as well as in country. A national level consultation is to be held to disseminate the information in the ESIA document.

Annex 6: Proposed Timeline for Selection of Owner's Engineer

Sl No.	Activity	Responsibility	Due Date	Status
1	Publication of Request for Expression of Interest (REOI)	BPDB	Sunday, August 16, 2015	Done
2	Hiring of independent evaluation committee (EC) member	BPDB	Monday, September 07, 2015	Bank provided probable references and CVs
3	Finalize Expression of Interest (EOI) evaluation committee members	MPMER/BPDB	Monday, September 07, 2015	Send Bank the final list
4	Finalize the EOI evaluation format and draft RFP (with help of Independent Evaluator)	BPDB	Thursday, September 10, 2015	
5	Opening of the EOIs	BPDB	Thursday, September 10, 2015	
6	Evaluation of EOI complete	BPDB	Sunday, September 20, 2015	
7	Evaluation report and Draft RFP sent to Bank	BPDB	Sunday, September 27, 2015	
8	Bank's No Objection to Short-list and Draft RFP	WB	Wednesday, October 07, 2015	
9	Issue RFP to the short-listed firms	BPDB	Sunday, October 18, 2015	
10	Pre-proposal conference	BPDB	Sunday, November 01, 2015	
11	Circulation of pre-proposal meeting minutes	BPDB	Tuesday, November 10, 2015	After receiving Bank's comments
12	Receive proposals	BPDB	Monday, November 30, 2015	This may be adjusted based on EPC contractor procurement progress
13	Evaluation of Proposal complete	BPDB	Tuesday, December 15, 2015	Including approval by the BPDB Board
14	Send Proposal Evaluaiton Report to Bank for No Objection	BPDB	Tuesday, December 29, 2015	

Annex 6: Proposed Timeline for Selection of Owner's Engineer

Sl No.	Activity	Responsibility	Due Date	Status
15	Bank provides No Objection to Proposal Evaluation Report	WB	Sunday, January 10, 2016	
16	Opening of Financial Proposal	BPDB	Monday, January 18, 2016	
17	Combined evaluation complete	BPDB	Sunday, January 31, 2016	
18	Contract Negotiation complete	BPDB	Sunday, February 28, 2016	
19	Draft negotiated contract sent to Bank for No Objection	BPDB	Monday, March 07, 2016	
20	No objection to Draft Negotiated Contract	WB	Tuesday, March 15, 2016	
21	Draft contract approved by CCGP	CCGP	Wednesday, March 30, 2016	
22	Signing of contract	BPDB	Thursday, April 07, 2016	