

# INTEGRATED SAFEGUARDS DATA SHEET CONCEPT STAGE

**Report No.:** ISDSC5074

**Date ISDS Prepared/Updated:** 23-Jul-2014

**Date ISDS Approved/Disclosed:** 22-Sep-2014

## I. BASIC INFORMATION

### A. Basic Project Data

<b>Country:</b>	Bangladesh	<b>Project ID:</b>	P128012
<b>Project Name:</b>	Bangladesh Ghorashal Unit 4 Repowering Project (P128012)		
<b>Task Team Leader:</b>	Mohammad Anis		
<b>Estimated Appraisal Date:</b>	12-Feb-2015	<b>Estimated Board Date:</b>	17-Jul-2015
<b>Managing Unit:</b>	GEEDR	<b>Lending Instrument:</b>	Specific Investment Loan
<b>Sector(s):</b>	Energy efficiency in Heat and Power (50%), Thermal Power Generation (50%)		
<b>Theme(s):</b>	Infrastructure services for private sector development (100%)		
<b>Financing (In USD Million)</b>			
Total Project Cost:	400.00	Total Bank Financing:	300.00
Financing Gap:	0.00		
<b>Financing Source</b>			<b>Amount</b>
BORROWER/RECIPIENT			100.00
International Development Association (IDA)			300.00
Total			400.00
<b>Environmental Category:</b>	A - Full Assessment		
<b>Is this a Repeater project?</b>	No		

### B. Project Objectives

The proposed development objective of the Project is to increase generation supply and efficiency;

### C. Project Description

1. The proposed Project would repower one of the four 210 MW gas-fired steam units Ghorashal power stations by adding one gas turbine & generator (GTG) and a heat recovery steam generator (HRSG) to the existing steam turbine (ST) unit for an upgraded capacity of about 400 MW. The targeted unit for repowering has already been identified through a feasibility study (completed in July

2012 by a consulting firm engaged through a Bank TA). This unit is currently generating 170MW and the overall efficiency of the unit is around 31%. As it came out of the feasibility study, the Project would increase the gross plant efficiency of the identified unit to 54% and the generation will be more than doubled. Consequently, fuel consumption (per GWh) would be reduced by 43%. The proposed Project will also be designed to operate the new gas turbine and existing steam plant independently from each other through a bypass stack allowing operational flexibility for the government.

2. Although the feasibility study looked into the alternatives of developing a new combined cycle (CC) technology along with other repowering options and full repowering came out to be the most economically viable options, the primary objective of this project is to increase the efficiency of the existing unit to ensure better utilization of scarce natural gas. Efficiency improvement in the existing plants is the government's key priority now.

3. The project would be built at the existing land and most of the existing civil structures would be retained. That itself would reduce construction cost by 10 per cent as compared with new construction on a green-field site. Existing auxiliary equipment would also be re-used with some modification and refurbishment. Repowering of the facility will also help achieve reduction in operation and maintenance (O&M) cost, reduction in emissions and other discharges and minimization of capital cost expenditures.

4. With a nameplate capacity of 950 MW (including other two 55MW steam units), Ghorashal is the largest power station in the country. The identified steam turbine unit at Ghorashal was installed in 1989. However, they are very robust machines, and the feasibility study has confirmed that there are good prospects for cost effective refurbishment and upgrade of this unit that can increase its useful life to another 25 years once repowered. Incorporating these machines into a new combined cycle configuration is a challenging exercise, although international experience has demonstrated its practicality. BPDB has already awarded contract to a consortium of Alstom and a Chinese developer to repower the unit no 3 at Ghorashal. MIGA has been approached by HSBC Bank, Hong Kong to provide political risk guarantee to this project. MIGA is currently doing its due diligence. BPDB has also tendered for repowering of unit 6. The feasibility study that was done for unit 4 has really paved the way for the government to proceed to such conversion (from steam unit to combined cycle unit) in Bangladesh.

5. As it is planned currently, the proposed operation has four components, notio nally estimated at US\$300 million in total. In addition to repowering of unit 4, the consulting firm in their feasibility study report has recommended for upgrading the associated power evacuation system and installing a gas pipe line. These two additional components have been included in the PCN at this stage, and their inclusion will be reassessed during project preparation.

6. Component 1: Re-powering of the target unit (\$250 million): This component would finance the attachment of a new gas-fired gas turbine to the existing 4th steam unit at Ghorashal and a heat recovery steam generator, power generator, and associated ancillary equipment for the full repowering of the identified unit. This component has been proposed based on the feasibility study by the consultant that has assessed various repowering options (feed water, hot windbox, hybrid and full repowering).

7. Draft Pre-qualification document and Bid document (with preliminary technical specifications) for this component have already been prepared by the consultants following the Bank guidelines and

reviewed by BPDB. Technical Specifications will be finalized after the Quick Scan RLA (Residual Life Assessment) is complete and during the subsequent pre-bid conference with the potential developers.

8. Component 2: Installation of a new 230 kV GIS substation and 230 kV high voltage line (\$25 million): For evacuation of the additional power from the proposed project, a new 230 kV GIS substation and a new 27 km long high capacity 230 kV double circuit transmission line to Tongi grid substation need to be installed by Power Grid Company of Bangladesh (PGCB). The new GT has to be connected to the new 230 kV GIS substation by means of a step-up transformer, a 230 kV cable and a 230 kV switchgear bay. The need for this component will be discussed in further details with PGCB.

9. Component 3: Installation of a new gas pipe line (US\$15 million): At present the gas is supplied to Ghorasal Power Station from Titas Gas Transmission & Distribution System through a 16 inch diameter pipeline and a Regulating & Metering Station (RMS) situated at the north east corner of the Power Station complex. Due to space constraint, a new gas station will need to be installed at the space available west of the proposed repowering site. One 16" gas line from inlet header of Titas RMS to be installed up to the bus of the gas station as mentioned above. From this bus, several gas lines will branch out. Individual branch will lead through gas compressor and associated facilities prior to connection to the individual unit to be repowered. This component, if agreed, will be implemented by Gas Transmission Company Limited (GTCL).

10. Component 4: TA for institutional strengthening support (\$10 million): To sustain the gains of the conversion through re-powering, it would be necessary to build up implementation and O&M management capacity and better monitoring and evaluation (M&E) of plant performance at the power station. This component would finance an Owner's Engineer (implementation support consultant) for the Project to bolster project governance while ensuring effective management of the construction and initial operation of the new power plant. This component would also support BPDB in the development and implementation of processes, procedures, standards, monitoring and management. Relevant training and study tours for the core BPDB project team and power plant personnel would be organized so they become receptive and familiar with the operation of the proposed installation. Using the experience at IDA financed Siddhirganj project, this component will also explore whether ERP (Enterprise Resource Planning) can be implemented at Ghorashal covering all the units.

#### **D. Project location and salient physical characteristics relevant to the safeguard analysis (if known)**

The proposed project will be implemented in the existing Power Plant Complex at Ghorashal (Location coordinates are: Latitude = 23.9797, Longitude = 90.637). Ghorashal falls in Narsingdi district and is located 50 km north-east of Dhaka. The site can be accessed by either Dhaka-Sylhet highway or Tongi-Narsingdi highway. The site is located besides the Sitalakha river and uses the water from that river. The Ghorashal Power Plant consists of 6 gas fuelled boiler/steam turbine installations. The units 1 and 2 are the first build installations (in the seventies), producing maximum 48MW each (design value 55 MW). The rest of the units have the same size and have 210 MW maximum design capacity each. The unit 4 has been considered for repowering under the proposed operation.

#### **E. Borrowers Institutional Capacity for Safeguard Policies**

The Bangladesh power Development Board (BPDB) will be the implementing agency for the

component 1. BPDB is responsible for major portion of generation and distribution of electricity mainly in urban areas except Dhaka and West Zone of the country. The Board is under the Power Division of the Ministry of power, Energy and Mineral Resources, Government of Bangladesh. 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. In addition, the country law also requires full environmental assessment of power plant. BPDB is fully aware about the Bank requirement of environmental and social assessment of the project.

Power Grid Company Bangladesh (PGCB) and Gas Transmission Company Ltd. (GTCL) are the implementing agencies for component 2 and 3 respectively. Both the agencies are now implementing the Sidhirganj Power Project (P095065) and have experience on the World Bank safeguard policies.

During the EIA process, the safeguard capacity assessment of the implementing agencies will be carried out.

#### **F. Environmental and Social Safeguards Specialists on the Team**

Shakil Ahmed Ferdausi (GENDR)

Dr. M. Khaliqzaman (GENDR)

Sabah Moyeen (GSURR)

## **II. SAFEGUARD POLICIES THAT MIGHT APPLY**

<b>Safeguard Policies</b>	<b>Triggered?</b>	<b>Explanation (Optional)</b>
Environmental Assessment OP/ BP 4.01	Yes	The project is expected to bring environmental benefit by increasing the efficiency of the power plant and subsequently reducing the emission. However, repowering will involve decommissioning of the existing boiler and associated equipment and also include installation of gas compressor, gas turbine, generator etc. Proper environmental management is required for both construction and operation phase. In addition, the project will support the new transmission line and substation. The environmental impacts of transmission lines construction are normally restricted to rights of way (ROW) and not significant. However, construction of new substation may require rehabilitation of the old substations and the key related environmental management issue would be the collection and disposal of old transformers and capacitors. New gas pipeline may also lead to some local environmental impact due to construction work. Environmental health and safety related risks in decommission of the existing boiler and new plant commissioning are major issues. Asbestos based insulators for steam pipes in the existing

		boiler/turbine system need to be removed during its decommissioning. Asbestos being a hazardous material has to be handled with special care. Currently, hydrazine is used in water treatment, which is a highly hazardous substance and a carcinogen. As per WBG EHS guidelines, Hydrazine should be replaced with a less hazardous substance which is now available. Due to anticipated morphology change of the Shitalakhya river during lifetime of the plant, the adequacy of current water use and supply availability have to be carefully looked into. An environmental impact assessment will be carried out during the preparation phase to identify the possible environmental impacts in component 1, 2 & 3. Environmental Management Plans (EMPs) will be prepared for 3 components with appropriate mitigation and monitoring activities. The cost of EMP implementation will be estimated and included the bidding document. Separate monitoring plan, arrangement and costing will be made.
Natural Habitats OP/BP 4.04	Yes	Environmental issues during the construction phase of power transmission lines and gas pipeline may include impacts on terrestrial and aquatic habitat. The possible impact on natural habitats will be addressed through EIA.
Forests OP/BP 4.36	No	The project area does not include any designated forest area.
Pest Management OP 4.09	No	Not relevant to the project
Physical Cultural Resources OP/ BP 4.11	Yes	During the EIA, studies will be carried out whether the routes of transmission lines and gas pipelines pass through areas with physical cultural resources.
Indigenous Peoples OP/BP 4.10	TBD	Although the proposed project is not expected to have any impact on indigenous people, the policy has been triggered as TBD since detailed information is not available now and social assessment will be carried out during preparation.
Involuntary Resettlement OP/BP 4.12	Yes	The addition of lines, expansion of existing networks and establishment of new sub-stations will require land; this may be public or private land depending on the routing of the lines and

		requirements of the substation location. Lying of 16 inch gas pipeline will lead to a small, but permanent loss of arable land, for which compensation may be required. Thus OP 4.12 has been triggered for the project.
Safety of Dams OP/BP 4.37	No	Not applicable here.
Projects on International Waterways OP/BP 7.50	No	
Projects in Disputed Areas OP/BP 7.60	No	

### III. SAFEGUARD PREPARATION PLAN

**A. Tentative target date for preparing the PAD Stage ISDS:** 31-Jan-2015

**B. Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing<sup>1</sup> should be specified in the PAD-stage ISDS:**

The environmental and social assessments will be carried out for the project. The ESA preparation work is expected to start early August. The appraisal mission is currently planned in Feb, 2015. All the safeguards mitigation plans along with the ESA will be prepared and disclosed prior to appraisal.

### IV. APPROVALS

Task Team Leader:	Name: Mohammad Anis	
<b>Approved By:</b>		
Regional Safeguards Coordinator:	Name: Francis V. Fragano (RSA)	Date: 09-Sep-2014
Practice Manager/Manager:	Name: Julia Bucknall (PMGR)	Date: 22-Sep-2014

<sup>1</sup> Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in country, at publicly accessible locations and in a form and language that are accessible to potentially affected persons.