

## Environmental and Social Review Summary

### Ghorasal Unit 3 Re-Powering Project

*This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed prior to the date on which MIGA's Board of Directors considers the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA's activities. This document should not be construed as presuming the outcome of the decision by MIGA's Board of Directors. Board dates are estimates only.*

*Any documentation that is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.*

Country:	Bangladesh
Sector:	Power
Project Enterprise:	Bangladesh Power Development Board (BPDB)
Environmental Category:	A
Date ESRS Disclosed:	September 10, 2014
Status:	Due Diligence

#### A. Project Description

The Hong Kong Shanghai Bank Corporation Limited (HSBC) of Hong Kong, China has requested MIGA to provide a Non-Honoring of Sovereign Financial Obligation guarantee for up to US\$200 million of debt financing and US\$50 million of swap transaction for a period of 13 years to Bangladesh Power Development Board (BPDB) for the Ghorasal Unit 3 Re-Powering project ("the Project") in Bangladesh. The Project involves the conversion of the existing 210MW steam turbine (ST) unit No. 3 in the Ghorasal power complex into a combined cycle power plant of more than 400MW. The repowering will be achieved by adding a new gas turbine (GT), heat recovery steam generator (HRSG), generator, auxiliaries and refurbishment of the existing equipment. The Project also includes construction of a 230kV switchyard, civil structures for Unit 3 (e.g. gas turbine building and the unit's electrical building), a temporary unloading area for transporting Over Dimension Cargo ("ODC") from the river and a water treatment plant. The temporary unloading area will be constructed of timber and sandbags close to the existing jetty, and a temporary transport arrangement, such as rail guides, may have to be laid to connect the temporary unloading area to the construction site. The Project is located within the existing Ghorasal power complex in Ghorasal, Narsingdi District, 40 km from Dhaka, Bangladesh.

Power generated by the Project will be evacuated via a proposed 28 km 230 kV transmission line, which will run from the power complex to Tongi, located approximately 15 km north of Dhaka. BPDB has plans to repower all four existing 210 MW Steam Turbine Units, and the transmission line, which will be constructed by the Power Grid Company of Bangladesh (PGCB), is being developed to evacuate power from all of the repowered units. As the Project does not rely on the construction of the line, and the line is not being constructed specifically for the Project, it is not considered an associated facility of the Project.

Gas will be supplied via the existing gas supply arrangement and pipeline from Petrobangla /TITAS.

The Ghorasal power complex consists of 6 gas-fuelled boilers and their respective steam turbines (2 x 55MW and 4 x 210MW) and is owned by BPDB. The power complex was originally built in the 1970's and the six units were installed and commissioned over a 25 year period with the first unit commissioned in 1974 and the last in 1999. Unit 3 was commissioned in 1986. BPDB is wholly owned by the Government of Bangladesh under the Power Division of the Ministry of Power, Energy and Mineral Resources. The nameplate (installed) capacity of the Ghorasal power complex is 950MW; however, as the units have aged, the actual output is currently much less (approximately 600 MW).

The Project is part of the overall government Power Sector Master Plan to increase energy generation in the country to meet growing energy demand. Re-powering of existing plants increases generation by extending the life and increasing the capacity and efficiency of existing facilities. In addition to Unit 3, there are several re-powering and new construction projects proposed for the Ghorasal power complex, including the re-powering of Unit 4, which the World Bank is considering supporting as part of a larger Power Generation Efficiency Improvement Project, which also includes construction of the 230 kV transmission line (referenced above) and a gas pipeline, and an institutional strengthening technical assistance program. The World Bank project is currently at concept stage.

An Engineering, Procurement and Construction contractor (a consortium of China National Machinery Import & Export Corporation (CMC) and Alstom Switzerland Ltd. Baden ("Alstom")) has been selected to undertake construction of the Project. CMC is the consortium leader, and will provide overall project management while Alstom is the technical leader of the consortium, providing technical expertise, including concept design and basic engineering, and supplying key equipment like Gas Turbine, retrofitting of steam turbine, HRSG etc. under the EPC contract. CMC will engage a construction sub-contractor (First Northeast Electric Power Engineering Company) to undertake the actual construction. CMC is a wholly owned subsidiary of China General Technology Holding Ltd., a state-owned enterprise under the direct supervision of the Chinese central government. CMC entered the Bangladesh market in 1994, and since then has undertaken 8 projects. Alstom is an international supplier of equipment and services for power generation, electricity transmission and transportation. Alstom will supply the main equipment for the Project.

HSBC is the coordinating arranger for financing of the Project. HSBC has adopted the Equator Principles, and as part of this commitment, it has commissioned independent technical and environmental consultants to undertake due diligence of the Project. The environmental and social due diligence review was done against national laws, MIGA's Performance Standards, World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines and the Equator Principles.

## **B. Environmental and Social Categorization**

The proposed re-powering of Unit 3 at the Ghorasal power complex is categorized as Category A under MIGA's Policy on Environmental and Social Sustainability (2013). The key potential

environmental and social issues associated with the project include water abstraction and effluent discharge, air pollution (NO<sub>x</sub> and greenhouse gases), noise, solid and hazardous waste (including asbestos) generation and disposal and worker / community health and safety risks. These impacts can largely be managed by adhering to generally recognized performance standards, guidelines, and / or design criteria.

### **C. Applicable Standards**

While all Performance Standards (PSs) are applicable to this investment project, based on our current information indicates that the investment will have impacts which must be managed in a manner consistent with the following PSs:

- PS1: Assessment and Management of Environmental and Social Risks and Impacts
- PS2: Labor and Working Conditions
- PS3: Resource Efficiency and Pollution Prevention
- PS4: Community Health, Safety and Security

The Project (including ancillary infrastructure) will be developed entirely within the boundaries of the existing Ghorasal power complex, and no additional land acquisition will be required. It is not anticipated that the Project will result in any physical or economic displacement, and therefore, PS5 does not apply.

The Project is not expected to have an impact on critical habitats, ecosystem services or species of conservation significance. Further, it is unlikely that the discharge of effluent will affect fisheries in the Shitalaskhya River. Therefore, PS6 does not apply. Impacts on fisheries, however, will be monitored, and if monitoring identifies a decline in indicator species/degradation of habitats then additional mitigation measures will be developed and implemented through the Environmental and Social Management Plan (ESMP, refer to information on the ESMP under PS1 below).

No indigenous people were identified in the area affected by the project; therefore, PS7 does not apply. No archaeological or historically important structures were identified in the area, and the probability of finding significant cultural resources in the Project area is low, therefore PS8 does not apply. Regardless, a chance finds procedure will be developed for the construction phase.

In addition, the WBG EHS General Guidelines and Guidelines for Thermal Power Plants apply to this Project.

### **D. Key Documents and Scope of MIGA Review**

The following documents were reviewed by MIGA:

- Initial Environmental Examination (IEE) of Re-Powering of Ghorasal existing 3<sup>rd</sup> Unit by Center for Environmental and Geographic Information Services (CEGIS) dated October, 2013;
- Environmental Impact Assessment (EIA) of Re-Powering of Ghorasal existing 3<sup>rd</sup> Unit by CEGIS dated June 2014;

- Feasibility Study on Re-Powering of Existing Power Plants of BPDB 210MW Steam Turbine Units at Ghorasal to Convert to Combined Cycle Units by KEMA International in association with Atlanta Enterprise Ltd. dated September 2012;
- Environmental Impact Assessment (EIA) of Regent Energy and Power Ltd. At Ghorashal, Palash, Narsingdi by Adriot Environment Consultants Ltd. (AECL) dated October, 2013;
- Project Concept Note for a Power Generation Efficiency Improvement Project (P128012) (World Bank, June 2013) – available on the World Bank InfoShop website;
- Integrated Safeguard Data Sheet Concept Stage for the Power Generation Efficiency Improvement Project (World Bank, June 2013) – available on the World Bank InfoShop website.
- Ghorashal 400 MW Repowering Project Environmental and Social Due Diligence Review, ERM dated August 2014.
- Government of Bangladesh / Asian Development Bank (ADB). ADB TA 4626-BAN: Corporatization of Bangladesh Power Development Board. Final Report – Appendix C. Human Resource Manual dated July 21, 2008.

In addition to the documents listed above, MIGA's due diligence included review of the environmental and social conditions and commitments in the Engineering, Procurement and Construction Contract, as well as other available environmental and social information on the area in the vicinity of the Project. A due diligence site visit was undertaken in May 2014. The visit included a visit to the Ghorasal power complex and meetings with HSBC, Government of Bangladesh (GoB) Ministry of Power, Energy and Mineral Resources, GoB Ministry of Environment and Forests, BPDB, lenders' E&S consultant, and EPC contractor. The findings of the site visit are incorporated into this ESRS.

## **E. Key Issues and Mitigation**

### PS1: Assessment and Management of Environmental and Social Risks and Impacts

#### *Environmental and Social:*

The Bangladesh Department of the Environment (DoE) categorizes power generation projects as "Red Category". Red Category projects are required to prepare and submit to DoE an Initial Environmental Examination (IEE) and an Environmental Impact Assessment (EIA) in order to obtain Site Clearance and Environmental Clearance Certificates. In this case, as the site is within the boundary of the existing power complex, a Site Clearance Certificate is not required. An IEE was submitted to DoE in October 2013, which included a detailed Terms of Reference (TOR) for the EIA study. An Environmental Impact Assessment (EIA), which included consideration of social risks and impacts, was prepared and submitted to BPDB in February 2014. As the definition of the Project had changed to include construction of a temporary unloading area for ODC a revised EIA TOR was submitted to the DoE in March 2014, and this TOR was approved in May 2014. A revised EIA was submitted to the DoE in June 2014, and was approved in August 2014 (approval information has been posted on DoE website – [www.doe.gov.bd](http://www.doe.gov.bd) – *Meeting Minutes of ECC- 378<sup>th</sup> Meeting*).

The EIA identifies and assesses the potential risks and impacts associated with the Project, and provides management, mitigation and enhancement measures. Key risks, issues and proposed

management measures are discussed in the sections below under the appropriate Performance Standard. The baseline information provided in a recent EIA for a nearby power project (AECL, 2013) was also used to supplement the information provided in the Project EIA.

An Environmental and Social Due Diligence Review, which included a gap analysis of the EIA against GoB regulations, IFC / MIGA Performance Standards and the Equator Principles was undertaken by independent consultants (ERM) from May – August 2014. Due diligence included review of the EIA and other documents (e.g. the feasibility study) provided by BPDB and the EPC contractor, as well as a site visit in May 2014. The gap analysis identifies Project risks and impacts, and evaluates the potential effectiveness of the proposed management measures was evaluated. The consultant prepared an Environmental and Social Action Plan (ESAP) to address the identified gaps. The ESAP attached to this ESRS is consistent with the ESAP prepared by the consultant. It is expected that the outstanding issues will be addressed by BPDB and the EPC contractor to ensure consistency with MIGA's Performance Standards.

*Management Program and Monitoring:*

The EIA identifies the major impacts and proposes mitigation measures in an Environmental and Social Management Plan (ESMP). The ESMP in the EIA covers decommissioning of the existing unit 3, construction and operations. The ESMP, however, will need to be updated to address gaps that have been identified in this ESRS, and are specified in the attached ESAP.

Both parties of the EPC consortium have International Standard Organization ISO14001:2004 consistent Environmental and Social Management Systems (ESMS) in place. For the construction phase, the EPC consortium will apply an integrated Environmental, Health and Safety (EHS) System, based on ISO 9001:2008, ISO 14001:2004 and British Standard for occupational health and safety management systems OHSAS 18001:2007 standards. The EPC consortium has prepared a standard Environment, Health and Safety (EHS) Plan for construction. As agreed with the client and indicated in the attached ESAP, prior to commencing construction, the EPC consortium will prepare and provide to MIGA a detailed project specific EHS Plan that is based on the principles outlined in the standard EHS Plan.

There is currently no formal ESMS in place at the Ghorashal facility, and BPDB does not have an ESMS. BPDB does consider environmental requirements in the overall planning and implementation of its operations in an ad-hoc manner. BPDB will prepare an ESMS for the entire Ghorashal complex.

As described above, BDPB will update the ESMP provided in the EIA and submit it to MIGA for review and comment. The ESMP in the EIA provides a framework to guide the BPDB in preparing an ESMP covering the whole Ghorashal complex. The ESMP will include an environmental monitoring program which will cover water quality, air quality, noise and aquatic ecology, among other environmental aspects.

*Organizational Capacity and Training:*

The EPC consortium has experience in re-powering of thermal power facilities. CMC has operated in Bangladesh for two decades, and has recently completed the construction of the ADB-financed Sirajganj combined cycle plant in the northeastern region of Bangladesh.

The EPC consortium will be responsible for implementing the EHS Plan, including the monitoring program, and for the preparation of monthly reports regarding implementation during construction. An EHS Manager has been appointed for the construction phase. The EPC consortium has the responsibility to arrange training of personnel during construction, and have committed to ensuring that all EPC staff and sub-contractors have the experience and training that is required for their specific job.

BPDB has benefited from institutional strengthening programs run by the Asian Development Bank (ADB) as part of their ongoing investment in the power sector in Bangladesh. The recent completion report for the Power Sector Development Program (2004 – 2012) indicated that BPDB effectively met all but one environmental condition in the loan agreement (and the one condition not met was due to issues associated with corporate restructuring, rather than BPDB implementation). As part of the ESMS, BPDB will develop an environmental and social training plan for Ghorasal staff. Further, the EPC consortium contract indicates that it will provide some training, including training on EHS aspects, to BPDB personnel.

#### *Monitoring and Review:*

A monitoring and reporting program will be developed and included within the project specific EHS Plan for construction and the EMP for operations. Daily and monthly environmental checklists will be developed for construction monitoring and reporting.

BPDB has a website, which publicly discloses company information and information on planned, under construction and generation projects. Project EIAs are also disclosed on the website once they are approved by DoE. During both construction and operations, annual environmental and social monitoring reports will be prepared and submitted to MIGA. During operations, environmental monitoring reports are also submitted regularly to DoE.

#### PS2: Labor and Working Conditions

There are currently 1,255 permanent employees and approximately 100 contractors (for security and housekeeping) employed at the Ghorasal complex. The construction phase will require approximately 700 workers at peak, including approximately 140 expatriate technical specialists and 560 locally recruited technicians and laborers. The EPC contractor(s) follow their respective HR policies, which will be supplemented with the requirements of Bangladesh national laws, which include consideration of equal opportunity employment and prohibits child labor.

Once construction is completed, operation of the repowered facility will be undertaken by the existing Ghorasal complex staff and some additional staff will be hired. The human resource management at the Ghorasal complex is governed by BPDB's Service Rules of Employment (1982) and the Bangladesh Labor Law (2006, amended 2013). The Service Rules provide information on the general conditions of service and the mechanisms by which all employees will be informed of their working conditions and employment terms, employees' rights, rights to wages and benefits and information on national labor and employment laws. BPDB has a collective bargaining agreement with employees that outlines agreed on working conditions and only hires workers who are over the age of 18.

In addition to the Service Rules, as part of the corporatization process, an ADB technical assistance program developed a Human Resources (HR) manual for BPDB (July 2008). The content of the BPDB HR manual is consistent with the requirements of PS2.

BPDB has a documented grievance mechanism for workers. The mechanism allows employees to raise any concerns regarding their working environment. Concerns can be raised through their superiors or directly to the central Enquiry and Discipline Directorate. In addition, the Collective Bargaining Agent and the various employees' unions and forums remain active in raising such concerns with the senior management of the board. The terms and conditions of temporary workers and contractual employees are governed by the individual contracts which are drawn in line with the government policy and labor laws. Standard contract terms require contractors to follow all labor laws and regulations in effect in Bangladesh.

An occupational hazard assessment was undertaken as part of the EIA, and in response to the identified risks, Safety and Emergency Plans were developed for construction and operations as part of the EMP. The Safety and Emergency Plans includes fire safety, explosion safety, electrocution safety, medical emergency and hazardous materials management plans. ESMS development for the Ghorashal complex will consider and incorporate the safety and emergency plans developed for Unit 3.

Written procedures for occupational health and safety (OHS) issues have been developed for construction in accordance with OHSAS 18001:2007 requirements. The EPC contractor will provide staff with Personal Protective Equipment (PPE) and will ensure that staff is appropriately trained in the health and safety aspects of their jobs. The EPC contractor has committed to conforming to the requirements of ISO 14001:2004, OHSAS 18001:2007, and all respective national legislation as applicable for the scope of work and has identified the following responsibilities:

- Compliance with relevant legal requirements;
- Preparation and Implementation of the Project specific EHS Plan;
- Enforcement of the EPC consortium site rules;
- Monitoring the activities of all subcontractors with regard to EHS, and maintaining corresponding records;
- Providing safety infrastructure and PPE; and
- Job risk analyses are carried out and appropriate training provided.

The current General Regulations and Standard Operating Codes, including Safety Practices (1992) will need to be revised to be in line with operating specifications for the new unit. BPDB will review OHS policies and procedures to ensure compliance with MIGA's PSs.

### PS3: Resource Efficiency and Pollution Prevention

Air pollution, noise pollution, water quality/pollution, and solid waste are the main environmental issues associated with the proposed project.

*Air Quality:*

The primary air quality emissions from the Project are likely to be dust (particulate matter (PM)) during construction and nitrogen oxides (NO<sub>x</sub>) and carbon dioxide (CO<sub>2</sub>) during operations. Since Bangladesh indigenous gas contains no dust and virtually no sulfur, it is anticipated that there will be negligible sulfur oxides (SO<sub>x</sub>) or particulate emissions in the exhaust gas from Unit 3 during operations.

The EIA provides an air quality baseline, (which captures current cumulative of emissions from the Ghorasal Power Complex and other industrial units in and around Power complex), which indicates that concentrations of respirable dust (PM<sub>10</sub>), SO<sub>x</sub> and NO<sub>x</sub> are below the allowable limits set by the Bangladesh DoE Ambient Air Quality Standards, though levels of PM<sub>10</sub> and SO<sub>x</sub> exceed the World Health Organization (WHO) Ambient Air Quality Guidelines (2005). The baseline in the EIA, however, is based on two non-continuous days of sampling (one day in July 2012 and another in August 2013– both during the rainy season). Such a short period does not allow for potential longer term fluctuations in meteorological conditions or local emission sources which could have a significant impact on pollutant concentrations, and therefore the conclusions of the baseline assessment cannot necessarily be considered representative of ambient conditions. A more robust monitoring scheme will be put in place during the pre-construction phase to support these baseline conclusions, and allow for long-term monitoring of emissions from the Ghorasal facility, including the repowered Unit 3.

The area has predominantly sandy soils which, when exposed, can pollute the air in the event of winds with dust and particles and also due to the movement of light and heavy transport vehicles required for construction. During construction, the impacts of dust generation will be short-term and primarily confined to the immediate area of the Project. Mitigation measures will be applied to reduce the risk of breathing problems for people on site; such as implementing dust control procedures, including watering of roads and cleared areas during dry periods.

The repowered Unit 3 will use a dry low NO<sub>x</sub> (DLN) burner limiting formation of NO<sub>x</sub>, and NO<sub>x</sub> emissions from the repowered unit are estimated to be less than 25 ppm (which is consistent with WBG EHS Industry Guidelines for Thermal Power Plants (2007)). The EIA used the SCREEN 3.0.0 model to simulate ground-level concentrations of NO<sub>x</sub> downwind of the new facility. The analysis included the consideration of existing background air quality conditions, and the cumulative impact of the Project in addition to the existing conditions. The results of the analysis indicate that peak 1 hour ground-level concentrations of NO<sub>x</sub> will occur approximately 3 km downwind of the stack, and will be well below WHO Ambient Air Quality Guideline (2005) value for NO<sub>x</sub>.

*Greenhouse gas emissions (GHGs):*

The overall net efficiency of the existing Unit 3 is currently approximately 27.41%. Re-powering will increase the net efficiency to about 55.7% with only an approximately 4 % increase in gas supply, which will result in the specific CO<sub>2</sub> emissions (i.e. emissions per MW) of the re-powered unit being reduced by approximately 51 %. Total GHG emissions, however, are expected to increase by 4 %. It is estimated that emissions will be approximately 360 tons CO<sub>2</sub> per Gigawatt hour (GWh). At full capacity, CO<sub>2</sub> emissions for the project are estimated to be 1.31 million tons CO<sub>2</sub> equivalent per year.

Quantification and monitoring of GHG emissions will be conducted annually in accordance with internationally recognized methodologies.

*Water Quantity and Quality:*

Water requirements for the Project have been estimated to be 28,160 tons per hour (tph) for plant cooling water, which is the same as the amount currently used by Unit 3, and 0.5 tph of potable water. The Plant cooling water will be drawn from the existing water intake on the Shitalaskshya River under existing extraction permits for the Ghorasal complex and the plant make-up and process water will be drawn from the existing coagulated water system, which is used by the entire Ghorasal complex. Coagulated water will be treated prior to use. Potable water will be drawn from groundwater wells. A majority of the water will be reused and / or returned back to the river; however, some effluent discharge will be required. Effluent will be treated prior to discharge.

The EIA provides a baseline of hydrological conditions in the Shitalaskshya River. The data used to develop the baseline was collected by the Surface Water Processing Branch of Bangladesh Water Development Board (BWDB) from Lakhpur and Demra monitoring stations (located on the Shitalaskshya River upstream and downstream, respectively, of the Ghorasal site). From the available data, it appears that water requirements for the Project are approximately 2% of average low flows in the Shitalaskshya River, which indicates that there is sufficient water available for the Project. The available data, and comments from stakeholders, however, indicate that flows in the river are decreasing due to increased abstraction for industrial, agricultural and aquaculture purposes. The cumulative impact of water abstraction by the other five units at the Ghorasal plant (and any proposed planned additional units) and the other industries along the river were not considered in the EIA. As currently planned, groundwater resources will not be affected by the abstraction of water for the Project.

The water quality baseline provided in the EIA indicates that the quality of water in the Shitalakshya River is already severely degraded due largely to effluent discharge from the upstream Ghorasal Urea Fertilizer Factory and an oil terminal situated on the bank of the river. The water treatment system for the Project will comprise filtration and a chlorination plant and demineralization plant to treat the makeup water for the boilers and the HRSG and an existing effluent treatment plant to treat wastewater. The existing Ghorasal complex water treatment infrastructure – both for makeup water and for wastewater – will be utilized by the Project. The plant process water requirements shall be taken from the existing coagulated water system. As a result, the re-powering of Unit 3 will likely reduce the amount of effluent and the contaminant load from the entire Ghorasal complex. BPDB will treat the water to achieve the Environment Conservation Rules (1997, amended 2005) standard prior to discharge. This standard is largely consistent with the WBG EHS Guidelines for Thermal Power Plants; however, there are a few cases where the WBG EHS Guidelines are more stringent (i.e. Total Suspended Solids (TSS), iron, zinc, cadmium and mercury). Where they are more stringent, BPDB will incorporate the WBG EHS Guideline values into the water management and monitoring plan. There will be no increase in thermal pollution from the repowering of Unit 3, as the plant will have the same water circulation scheme as the existing unit. As part of the detailed water management and monitoring plan (see next paragraph), BPDB will investigate existing thermal pollution, and if required take steps to mitigate any impact. Septic tanks will be installed to store domestic waste water and sewage. The tanks will be regularly emptied by qualified contractors.

To minimize the impact of water abstraction and effluent discharge on the Shitalakshya River, BPDB will develop a detailed water management and monitoring plan for the Ghorasal complex. This plan will include consideration of thermal pollution, impacts on fisheries and cumulative impacts of industrial activity in the region on the Shitalakshya River.

*Noise:*

Ambient noise analysis was undertaken in 2013 for the proposed development area. It is not clear over what period noise was monitored or what methodology or equipment was used. The results demonstrate that noise levels near the existing operating units range from 70 decibels (dBA) to 82dBA. At the employee rest house (within the boundary of the Ghorasal Plant site), noise ranges from 63 dBA to 72 BA. Noise levels appear to attenuate rapidly off site, with downstream noise levels ranging from 45 dBA to 54 dBA, which are within the WBG EHS Guidelines for residential areas.

Noise and vibration are normally generated from construction activities such as dismantling existing equipment, piling of foundations, crushing of stones and bricks, installation of machines and equipment and by the use of heavy machinery. The EMP includes appropriate noise reduction measures and consideration of noise barriers, which will be incorporated into the final project design.

During operation, noise levels within the Ghorasal Plant boundary are likely to exceed the Bangladesh Standard for Industrial Zones for daytime (75dBA) and night time (70dBA) (primarily due to the cumulative effect of the operation of all six units). Regardless, the repowering of Unit 3 is unlikely to result in an increase noise at the plant site and / or in surrounding areas more than 3 dBA above the baseline (the emissions standard in the WBG EHS Guidelines). Project design includes the installation of low noise generating equipment, as well as insulation of noise generating equipment and planting of a “green belt” (strip of vegetation) to provide a screen to reduce noise levels at sensitive receptors.

*Hazardous Materials:*

Gas fired power plants tend not to handle many hazardous materials; however some types of hazardous goods used during construction and operations may represent some risk. Gas will be delivered via the existing pipeline, and metering station, which have been designed according to appropriate design safety standards.

The existing Ghorashal facility has been found to have some ‘Asbestos Containing Material’ (ACM). Asbestos sampling, analysis and monitoring was undertaken at the site by an Independent Consultant in 2012. The assessment determined that the ACM present at the Ghorashal facility was of the lowest hazard ranking (based on the U.S. Asbestos Hazard Emergency Response Act ranking system), as the ACM present is primarily Chrysotile (the type of asbestos fiber that is considered to be relatively safe), is non-friable and is in good condition. Regardless, ACM will have to be carefully managed during the decommissioning of the existing facility and ongoing operation of the Ghorashal facility. BPDB will prepare an Asbestos Abatement and Management Plan, and the EPC will include measures to address safe handling of ACM in their project-specific EHS Plan.

*Waste:*

The majority of wastes will be produced during the construction phase. These wastes will include materials such as bricks, concrete and scrap metals. Should contaminated wastes be generated these will be disposed of at appropriate hazardous waste disposal sites. Recyclable waste materials will be collected separately. The Project-Specific EHS Plan will include detailed information on waste generation, handling and disposal during construction. Waste generated during operations will include paper, packaging materials and food wastes.

PS4: Community Health, Safety and Security

The Ghorashal power complex is located within the Ghorashal town, and the complex is surrounded by residential areas. The community within the complex is comprised of about 1,200 workers and their families. The residential area within the complex is located south of the power plants, and is physically separated from the plants by a vegetation strip and fencing. There is a primary school and a high school within the complex, and students are both residents of the complex and residents of neighboring communities. There is a health center in the complex, which is staffed by three qualified doctors. There is one firefighting station located near the Ghorasal Power complex.

The potential community health and safety risks include fire and explosion risk, traffic accidents, electrocution, air emissions and unauthorized access to the site.

As described under PS2, the EIA included an assessment of safety hazards, and Safety and Emergency Plans, which include plans for fire and explosion. The design of the Project includes installation of a fire protection system and fire water pumps. BPDB has committed to engaging a suitably qualified professional to undertake a full review of the Fire and Life Safety (F&LS) conditions and practices at the Ghorashal facility and to develop a Corrective Action Plan.

The existing main road network to the project site is in fairly good condition though the feeder road from the main highway will need to be upgraded to accommodate heavy machinery. During construction, materials will be transported to site by road, rail or the river, as the site is easily accessible to all three forms of transit. The Ghorashal complex has an existing jetty along the Shitalakshya River, which can handle equipment up to 110 tonnes, and the EPC will construct a temporary unloading area for construction. A traffic management plan will be developed and implemented during construction. Traffic movements during operation will be limited to personnel and maintenance vehicles, and it is considered that the existing road network has sufficient capacity to accommodate such movements without significant impact.

Unauthorized access will be minimized by security guards preventing access to the facility, fencing, and public education campaigns. The safety and emergency plans specify the importance of providing training for the local people living around the Project to ensure awareness of the risks associated with the power plant.

Flood is a common phenomenon throughout Bangladesh. Every year certain areas of the country are subjected to flooding. The Project is not located on a flood plain, and despite proximity to the river, the area does not have a history of flooding.

The EIA does not provide a thorough assessment of the potential community health and safety risks, however based on Project design and proposed management plans, it is likely that there is only a very limited risk to public health except in serious emergency cases. Community health and safety will be coordinated with local municipal bodies such as the fire service, police and ambulance. These commitments will be elaborated in a detailed Emergency Response Plan for operations.

*Security Arrangements:*

BPDB engages contractors to provide security for the plant. Further, as the Ghorashal plant is considered a national ‘Key Point’, the site is also protected by the police, military and para-military. BPDB will develop a Security Protocol to guide management of its own security force. The Protocol will include measures for assessing security risk, engaging and training security contractors, incident response and investigation and monitoring of performance. Government and law enforcement authorities are responsible for managing police, military and para-military forces.

## **F. Environmental Permitting Process and Community Engagement**

The Bangladesh Department of the Environment (DoE) categorizes power generation projects as “Red Category” of industrial processes for which an Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) is required. The EIA TOR was approved in May 2014, and revised EIA as submitted in June 2014 and approved in August 2014.

Consultation undertaken during the EIA process consisted of two participatory focus group discussions and meetings with Ghorasal plant staff. Although within the EIA there is documented evidence of stakeholder engagement, a formal stakeholder engagement plan (SEP) has not been developed and there is no formal grievance redress mechanism. Stakeholder consultation undertaken as part of the EIA indicated that the issues of water availability and quality were of significant concern to local residents.

A SEP will be developed to include the consultation and disclosure activities that will occur throughout Project preparation and implementation. The SEP will include including formal grievance redress mechanism. The existing stakeholder consultation/disclosure process will be articulated within the SEP and will include stakeholders identified by the project company as directly affected and vulnerable people.

## **G. Environmental and Social Action Plan**

An action plan has been prepared to address the gaps between proposed implementation and the requirements of the Performance Standards that are identified in the sections above. Please refer to the attached “Environmental and Social Action Plan for the Re-Powering of Ghorasal Unit 3 – August 2014.”

## H. Availability of Documentation

- [Final Report on Environmental Impact Assessment \(EIA\) of Re-Powering of Ghorashal existing 3<sup>rd</sup> Unit with Gas based combined cycle capacity of 400 MW±5%](#) at Site conditions on turnkey basis at Ghorashal, Narsingdi District, under Bangladesh Power Development Board (BPDB) (June 2014)
- [Environmental Impact Assessment of Regent Energy and Power Ltd.](#) At Ghorashal, Palash, Narsingdi by Adriot Environment Consultants Ltd. (AECL) (October, 2013)
- [Environmental and Social Action Plan \(ESAP\)](#) (August 2014)

The above listed documentation is available electronically as PDF attachments to this ESRS at [www.miga.org](http://www.miga.org). The Final EIA Report is also available for viewing at the following locations:

- BPDB, Project Director  
Ghorasal Repower Project,  
Bangladesh Power Development Board,  
Palash, Narsingdi, Bangladesh  
(e-mail: [pd.ghorasal.rpp@bpdb.gov.bd](mailto:pd.ghorasal.rpp@bpdb.gov.bd))