Executive Summary for the Environment and Social Assessment of 1400 MW coal based thermal power plant at Kamalanga, Odisha, India

GMR Kamalanga Energy Limited

Executive Summary

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1 EXECUTIVE SUMMARY: INDEPENDENT ENVIRONMENTAL AND SOCIAL AUDIT FOR GKEL THERMAL POWER PLANT, JULY 2014

ERM India Private Limited (ERM) was commissioned by GMR Kamalanga Energy Limited (henceforth referred to as 'the client' or 'GKEL') to undertake an independent Environmental, Occupational Health & Safety and Social Compliance Audit for their 1400 MW captive coal based thermal power plant located at village Kamalanga, Dhenkanal District in the state of Odisha (henceforth referred to as the 'GKEL TPP' or the 'Project').

The purpose of the Environmental, Occupational, Health and Safety (OHS) and Social Compliance Audit was to identify gaps in the existing compliances and systems/practices against national/state regulatory requirements as well as against the Fund's Performance Standards and related EHS guidelines. The compliance audit is at the behest of the investors (IIF and IDFC) in order to evaluate ongoing environmental, health and safety and social performance of the project and to provide recommendations to close the gaps through a time bound action plan.

This report covers the Environment and Social aspects and provides a gap assessment with respect to the above mentioned applicable reference framework describing areas of conformance and non-conformance and highlighting the key issues of non-conformance along with proposed recommendations and suggested Corrective Action Plan (CAP) for the gaps identified.

Background

GKEL is an Special Purpose Vehicle (SPV) for a 1,400 MW captive coal based thermal power plant ('Project') being built by GMR Energy Limited ('GEL') in the state of Odisha over two phases. GMR Energy Limited has 85.99% stake in the SPV along with the balance stake being held by India Infrastructure Fund (IIF) having 11.37% and IDFC as 2.64 %.

Phase I of the project achieved financial closure in 2009 with total installed capacity of 1,050 MW and with the first, second and third unit commissioned on April 2013, November 2013 and March 2014 respectively.

Phase II of 350 MW capacity has secured all related regulatory approvals and work on the same has to commence after the contract is awarded. The plant has been awarded Mega Power Status by the Ministry of Power.

The Project has an existing fuel linkage with Mahanadi Coalfields Limited (MCL) for 500 MW capacity and also has tapering linkage for 550 MW. ERM understands that the balance coal requirement will be met from Rampia Coal Mines, Odisha, which has been allocated for joint development to 6 companies including GMR. GKEL has executed a Power purchase agreement (PPA) with

GRIDCO (Odisha) and DHBVNL& UHBVNL (Haryana) as well as the Bihar State Electricity Board.

Applicable Reference Framework

The Environmental and Social compliance audit was carried out and evaluated against the following criteria:

- Applicable National and Local legislations on environmental and social aspects;
- Equator Principles, 2013
- The Fund's environmental and social policies and guidelines, particularly:
  - Funds and IFC Performance Standards on Social and Environmental Sustainability (January, 2006);
  - IFC/WB Environmental Health & Safety Guidelines – General and for Thermal Power Plants; and
- All requirements and mitigating or monitoring measures specified in the Environmental Impact Assessment.

Methodology

The approach and methodology for the assignment is based on information made available from GKEL, ERM's previous experience of working on similar projects and understanding of key environmental and social sensitivities related to the thermal power sector in general. The approach for the assignment focuses on the core activities as described below.

The scope of the assessment included the components of the plant and other associated facilities within the project boundary of the GKEL Thermal Power Project.

ERM organized a kick-off discussion with GKEL team at the first day of site visit at their Kamalanga complex to obtain an overview about the present status of the Kamalanga Power plant project and discuss their expectations, request for documents and finalize timelines for the site investigation and the deliverables.

This was followed by a desk-based review of information of the thermal power plant and its ancillary components along with a review of documentation on corporate-level systems and procedures for Social and Environmental Management aspects.

ERM team comprising of a social and an environmental expert visited the GMR Kamalanga Energy Plant from ***21st April to 25 th April 2014.***

Subsequent to the site assessments, ERM had a meeting with GKEL team at the GKEL administrative building on 25th April 2014 to discuss the

observations of the compliance audit. The issues and gaps were discussed and clarifications and perspectives of the GKEL team were sought.

This report has taken note of the clarifications and evidences submitted by GKEL against some of the observations. The report has been compiled based on the findings and observations from the site assessments; review of documentation provided by the client and selected stakeholder interactions held during the auditing process.

As part of the auditing process, a number of stakeholders were consulted during the site assessment. The stakeholders comprised of internal stakeholders including company workers, managers, site engineers, EHS officers, etc. as well as external stakeholders including the community representatives, contractors and workers. The consultation process intended to understand their roles, responsibility, participation levels as well as their awareness about EHS.

A closing meeting was held with GKEL management, where ERM presented their observations. The issues and gaps were broadly discussed and clarifications and perspectives of the GKEL team were sought.

Limitations

Professional judgements expressed herein are based on facts and information provided by GKEL and other stakeholders. Wherever, ERM has not been able to make a judgement or assess any process, it has highlighted that as an information gap and suggested a way forward. This report is strictly based on the review of the documents provided by the client and the site assessment undertaken in April 2014. This report does not cover the assessment of the following components:

- MCL coal fields in Talcher;
- Imported coal from coal fields in Indonesia; and
- Suppliers of coal in the open market.

ERM would also like to mention that the review was based on readily available information/ documentation, visual reconnaissance, and management interviews in course of the site visit. The scope of work did not include any sampling, analysis of environmental media, collection of primary data, engineering design or development of technical specifications or cost estimates among others.

Assessment of Environment and Social Risks

The findings of the audit are organized into two broad categories, i.e. the gaps assessed with respect to IIF performance standards (including WB-IFC General EHS Guidelines, and gaps with respect to key regulatory compliance.

An Environmental Impact Assessment (EIA) study for Phase 1 (1050 MW including Unit 1, 2 and 3) was carried out by NEERI in 2007 based on which the Environmental Clearance (EC) was obtained in 2008. EIA for Unit 4 was carried out by S.S. Environics in 2009 and based on which EC for Unit 4 was obtained in 2011.

GKEL has an integrated Management system Manual for Environment as well as Occupational Health and Safety which includes detailed Standard Operating Procedures (SOPs) as well as operational control procedures. GKEL has obtained ISO – 9001, ISO- 14001 and ISO – 18001 for unit – 1 and ISO – 14001 AND ISO – 18001 for unit - 2 & 3.

GMR has its own Corporate EHSQ Policy, HR Policy, Whistle Blower Policy as well as CSR Policy. GKEL does not have any project specific Policy and follows the corporate policies and the same have been implemented at the project level.

GKEL also has an Environment Management Plan for the following aspects:

- Air Environment;
- Noise Environment;
- Waste Water Management;
- Ash pond Management
- Solid and Hazardous Management
- Green Belt development
- Biological Environment; and
- Environment management System.

GKEL submits the Annual Environment Statement to Odisha State Pollution Control Board and recently submitted the same on 25.09.2013. GKEL submitted its 12th Half Yearly Compliance report of 1050 (3X 350MW) Thermal Power Plant towards the Environmental compliance vide letter no. J-13011/64/2007-IA.II (T) dated.5th February, 2008.

Gap Analysis against Performance Standards and Corrective Actions:

The gaps against the General EHS Guidelines, IFC/WB EHS Guidelines for Thermal Power Plants, and IIF performance standards were assessed. The corrective actions and mitigation measures recommended are provided below.

Table 1.1 Environment and Social Corrective Action Plan

Item No.	Corrective Actions	Priority (Low/Med./ High)*	Responsibility	Expected Deliverables (Report/Measurement)
1.	Obtain Consent to Operate from Orissa State Pollution control Board for the 30-bedded Vivekananda Hospital	High	EHS Department,	Application form
2.	Leakage of fly ash from the pneumatic conveying system of Unit 1 (conveying fly ash from boiler to ESP) needs to be rectified. Further it is to be ensured that all connections such as hoods, pipes, valves, stacks and chimneys are made leak proof. Regular inspection should be carried out to identify leaks if any and maintenance activities should be carried out to rectify the same. Also the coal composition testing should be done thoroughly to identify the ash content and the nature of the ash which enables in designing the conveyor system accurately.	High	EHS Department	Physical Verification
3.	Water spraying arrangements at coal stock piles	High	EHS Department	Physical Verification
4.	Leakage of coal dust from connection between coal bunker and coal mill of Unit 1 needs to be rectified. Further it is to be ensured that all connections such as hoods, pipes, valves, stacks and chimneys are made leak proof. Regular inspection should be carried out to identify leaks if any and maintenance activities should be carried out to rectify the same.	High	EHS Department	Physical Verification
5.	Tree plantation near the dust prone areas within the project area.	High	EHS Department	Physical Verification
6.	Data logger supported with multi-port connectivity output preferably 4-20mA for transmission of online data of stack monitoring and AAQ monitoring stations through Y cable and GPRS network to the server of OSPCB should be installed and prior consent should be taken from OSPCB.	High	Electrical Department, EHS Department	Internal Documents of the Data Logger with OSPCB
7.	GKEL should conduct AQ dispersion modelling for all the seasons and depending upon the outcome of the same, GKEL should also conduct AAQ monitoring at sensitive/ high impact receptors falling in the impact zone of power plant outside the site.	High	EHS Department	Monitoring reports
8.	GHG Emission inventory should be prepared by GKEL and the Amount of CO2 equivalents should be calculated based on the amount of coal consumption as well as transportation vehicles. GKEL should follow IFC Carbon Emissions Estimator Tool (CEET) and USEPA scope of greenhouse emissions calculator tool to estimate the GHG emissions generated from its operations. Depending on the outcome of the study, arrangement of emissions offsets (including the Kyoto Protocol's flexible mechanisms and the voluntary carbon market), including reforestation, afforestation, or capture and storage of CO2 options should be adopted.	Medium	EHS Department	GHG Emission Inventory
9.	GKEL should ensure that the vehicles used for transportation of materials are checked for valid "Pollution Under Control" certificate.	Medium	EHS Department	Physical Verification of PUC

Item No.	Corrective Actions	Priority (Low/Med./ High)*	Responsibility	Expected Deliverables (Report/Measurement)
10.	Mercury emissions from stacks attached to the Boiler Units should be monitored.	Low	EHS Department , Operation Department	Emission Analysis Report
11.	The industrial wastewater should not be released into the garland drains and should not be discharged outside the plant boundary. The waste water generated from the Ash handling plant and the Cooling water blow down should be directed to the Effluent Treatment Plant, treated and reused in the HCSD system and used as cooling water makeup water respectively. The drains should be cleaned regularly and the oil mixed surface runoff should be sent to oily wastewater system.	High	EHS Department, Operation Department	Operational change/Physical Verification Water Balance should be thoroughly checked.
12.	GKEL should carryout surface run off study of the whole plant through expert institution/organization/ third party agency. Surface Water Quality Monitoring shall be carried out by GKEL in the area and records should be maintained and the same should be submitted to OSPCB regularly.	High	Electrical Department, EHS Department, HR Department	Surface Runoff Study & Surface Water Monitoring report
13.	• The locations of water sampling points for monitoring of water quality needs to be reworked to comply with EC conditions and included in the monitoring plan. • Toe Drain Monitoring should be carried out near the ash dyke area as per the consent conditions.	Medium	EHS Department	Monitoring reports
14.	• GKEL should maintain records of the recycled water quantities and have an accounting system for it; • GKEL should have a benchmarking system for comparison to establish the relative level of water conservation efficiency.	Medium	EHS Department	Revised Water Balance Diagram
15.	• EMP to be updated to include water consumption and conservation measures considering all construction as well as operational activities; • GKEL to ensure that water metering devices are provided for incoming and outgoing water at various water usage locations within the site.	Medium	EHS Department	Physical Verification
16.	All the storm water drains should be cleaned and maintained. Concrete parapet wall of adequate height should be provided all along the concreted drains on its both the sides with rain cuts at regular intervals to prevent entry of dust/ash from the road and work zone into the drainage system.	Medium	EHS Department	Physical Verification
17.	Fly ash should not be stored in open and should be provided with a belt conveying system from storage silos to transfer to the low lying filling areas by trucks inside the plant boundary.	High	Operation Department, EHS	Operational change/Physical Verification

Item No.	Corrective Actions	Priority (Low/Med./ High)*	Responsibility	Expected Deliverables (Report/Measurement)
			Department	
18.	Fly Ash composition study for leaching test, heavy metals testing etc. should be carried out by the site management prior to supplying it to brick manufacturers and the document should be submitted to the Regional office of the Ministry.	High	EHS Department, Operation Department	Fly Ash composition study Report
19.	• Bio Medical Wastes shall be collected and stored at a designated Bio-Medical Waste room as described under the Bio-Medical Waste Rules, 2003 and as amended. • Standard operating procedures for waste management during operation phase need to be properly implemented and monitored.	High	EHS Department	Physical Verification SOPS for waste Management
20.	• GKEL should ensure that hazardous waste is collected, stored and disposed off as per Hazardous Wastes Rules, 2008; • A periodical assessment and monitoring program specifically focused on contamination issues will mitigate the potential risk to GKEL in the long term. • GKEL should ensure that all the hazardous materials are stored as per MHISC Rules, 1989; • The Diesel storage areas should be provided with proper secondary containment.	High	EHS Department	Physical Verification
21.	• The Diesel barrel storage areas should be provided with proper secondary containment and concrete area with side drains and pits for collection of spilled diesel, if any	High	EHS Department	Physical Verification
22.	• ETP sludge and Oily Sludge should be quantified and recorded by GKEL	Medium	EHS Department	Estimation Records
23.	Solid waste bins should be provided across all waste generating areas inside the plant premises and good regular housekeeping should be maintained. Construction debris should be regularly collected from the dumped areas and stored in a designated closed area. Regular monitoring should be carried out by the EHS team to ensure that cleanliness is maintained within the plant premises.	Medium	EHS Department, Operation Department	Physical Verification
24.	Personal protection devices should be provided to the workers in the TG Floor area. Regular Maintenance of the equipment should be undertaken.	Medium	EHS Department, Operation Department	Physical Verification & Noise Monitoring reports
25.	The existing Emergency response Plan should also include the response mechanism for ash dyke breach and failure.	High	EHS Department, HR Department, Operation Department	Revised Onsite Emergency Plan
26.	GKEL's EHS team should strengthen the internal monitoring and auditing procedures on monthly basis till the project is	High	EHS	Inspection checklist

Item No.	Corrective Actions	Priority (Low/Med./ High)*	Responsibility	Expected Deliverables (Report/Measurement)
	complete with its all is construction activities. GKEL's Corporate should further undertake external auditing of the plant activities quarterly to ensure the implementation of the environmental and social mitigation measures.		Department	
27.	•IMS Manual to be upgraded and revised based on the existing operations and the social, labor, land and CSR related aspects and management strategies along with monitoring procedures should be incorporated and integrated in the manual. • The organogram should reflect an integrated structure of the Plant Operations head with the EHS department. •IMS Manual should have specific internal auditing checklists to undertake quarterly monitoring across its production activities.	Medium	EHS Department	Revised IMS Manual
28.	•Undertake a cumulative impact assessment for the project along with all its components to identify the E&S issues and furthermore, prepare a suitable management Plan for handling such issues.	Medium	EHS Department	Cumulative Impact Assessment Study
29.	•SOPs for control of fuel and chemical spillages to be prepared and communicated to related staff and workers; •The project should develop an Offsite Emergency response Plan that should integrate the aspects of the project sites and nearby communities.	Medium	EHS Department	SOPs for Control of Fuel and Chemical Spillages; Offsite Emergency Plan
30.	GKEL should develop an integrated internal and external communication procedure to be implemented at the sub-contractor level for the ongoing construction and implementation activities and documentation of such records should be maintained at site.	Medium	EHS Department	Records of communications
31.	The grievance redress mechanism should be disclosed to the community and should be displayed at community places such as Panchayat office or community halls.	Medium	Land and Corporate Relations	Display boards and written communication
32.	The statement (in The code of conduct in para 5.14.6) to be amended as follows: 'No employee shall involve in any political activity directly or indirectly while on duty'	Low	HR Department	Revision of the HR document
33.	GKEL should extend its supervision to the grievance redress mechanism available to its non-employee workers. GKEL should ask grievance registers to be maintained by its sub-contractors and quarterly statement on grievance redress to be submitted to it.	Low	HR Department	**Quarterly Report on Grievance Redress from Sub-contractors**
34.	GKEL will need to update the risk assessment, disaster management plan and Onsite emergency response plan into a consolidated document with: • Identification of offsite risks, hazards, disasters and mitigation measures taken thereof; • Key community and environmental sensitivities (such as village settlements, reservoirs, etc.) and the potential of offsite consequences along with mitigation measures; • A common communication and emergency response process flow for onsite emergencies as well as their	Medium	EHS Department	Offsite Emergency Plan and Revised Onsite Emergency Plan

Item No.	Corrective Actions	Priority (Low/Med./ High)*	Responsibility	Expected Deliverables (Report/Measurement)
	communication to authorities offsite; • Disclosure to communities in the vicinity of the project on the emergency readiness of GKEL in case of any incidents.			
35.	GKEL can consider undertaking baseline health monitoring in villages in the immediate vicinity and those at a certain distance from the plant for future reference. Adequate sanitary systems should be provided to the labour camps. Septic tanks should be renovated and made functional to avoid direct discharge on land.	Medium	EHS Department	Physical Verification
36.	• GKEL should compare the emergency response plan and risk assessment/disaster management plan to document a clear and stated communication procedure for any • hazards/situations with offsite consequences; • GKEL must inform the communities' offsite in Senapatiderana, Bhagabatpur,Kamalanga, Budhapanka, Tentulihata about their internal emergency preparedness plan, resources and responsibilities. • The existing Emergency response Plan should also include the response mechanism for ash dyke breach and failure.	Medium	EHS Department	Physical Verification Offsite Emergency Plan and Revised Onsite Emergency Plan
37.	GKEL to provide basic training to security staff for managing community.	Medium	EHS Department	Training records
38.	A livelihood restoration plan review by an independent agency should be undertaken to assess which of the project affected families have restored their income and which ones need additional support. Targeted and time-bound interventions to restore the livelihoods of such families be undertaken.	High	Land and Corporate Relations	Report of Livelihood loss and Restoration activities.
39.	Information disclosure and a grievance redress mechanism should be prepared and implemented.	High	Land and Corporate Relations	Information Disclosure and Grievance Redress Plan
40.	GKEL should follow the theoretical model of developing Greenbelt based on the Agro-climatic zone of the Plant and refer the Guidelines for developing Greenbelts by CPCB, March 2010. Based on this, a Comprehensive Green Belt Development plan should be prepared by GKEL.	Medium	EHS Department	Revised Green belt Development plan
41.	• Performance on green belt management should also be included in monthly EHSS performance report; • GKEL should explore the possibilities of developing green belt around the CHP, ash pond so as to develop as barriers for air and noise pollution into the nearby settlements.	Medium	EHS Department	Physical Verification
42.	• GKEL should ensure that no invasive alien species are planted onsite.	Medium	EHS Department	Physical Verification
43.	Maintain MSDS's and ensure all containers containing hazardous chemicals are labelled properly with details from the manufacturer such as the content, physical, and chemical properties and toxicological data. It is recommended to ensure a provision of adequate warning signage in storage areas regarding the potential hazards associated with chemicals through the usage of signs, labels and instructions. It is recommended to ensure disclosure of information pertaining to	High	EHS Department	Physical Verification

Item No.	Corrective Actions	Priority (Low/Med./ High)*	Responsibility	Expected Deliverables (Report/Measurement)
	handling of hazardous chemicals, to all the personnel of the facility.			
44.	• GKEL should ensure mandatory use of noise protection PPE while working in high noise zone; • Personal protection devices should be provided to the workers in the TG Floor area. • Site staff should encourage workers for using PPEs at site.	Medium	EHS Department	Physical Verification
45.	A resource sustainability study for the impacted one should be carried out by GKEL.	Medium	EHS Department	Resource sustainability study
46.	GKEL should ensure that impacts associated with the decommissioning phase are assessed and addressed at least 1 to 2 years prior to eventual decommissioning. A Project Decommissioning plan should be prepared.	Medium	EHS Department	Physical Verification
47.	• Pest control should be carried out at the facility and pest management strategies should be formulated on regular basis. A subcontractor should be hired to deploy dedicated personnel for the Pest management services within the facility and also undertake periodic internal audits to facilitate proper functioning of the control system. • Record keeping should be done on regular basis for the type of pest chemicals applied and respective infested areas. Any accumulation of stagnant water within the construction area should be immediately drained off. • GKEL should formulate and implement an integrated pest management (IPM) and/or integrated vector management (IVM) approach targeting economically significant pest infestations and disease vectors of public health significance.	High	EHS Department	Pest control Records
48.	Solar Power systems should be installed on the rooftops within the plant premises and the status of implementation shall be submitted to the Regional office of the Ministry from time to time.	Low	EHS Department, Operation Department	Physical Verification

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