Environmental and Social Due Diligence of 6th October Power Plant

Prepared by:

Integral Consult®

Cairo Office:
2075 El Mearaj City, Ring Road,
Maadi – Cairo – Egypt
Phone +20 2 25204515
Fax +20 2 25204514

Doha Office:
6th Floor Al Mana Tower B, Al Sadd, C-Ring Road, P.O Box. 55781
Phone: +974 4466 4203, +974 4455 0483
Fax +974 4466 7843

Email: info@integral-egypt.com
www.integral-egypt.com

A Member of

Environmental Alliance
January, 2017
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Cairo Office:
2075 El Mearaj City, Ring Road, Maadi – Cairo - Egypt
Phone +202 25204515 • Fax +202 25204514

Doha Office:
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Phone: +974 4466 4203, +974 4455 0483
Fax: +974 4466 7843
Email: info@integral-egypt.com
# Table of Contents

1 Executive Summary ................................................................. 1
  1.1 Scope and purpose of review ..................................................... 1
  1.2 Methodology ........................................................................... 2
  1.3 Status of requested project documentation .................................. 2
  1.4 Power plant status .................................................................. 3

2 Project Description ..................................................................... 4
  2.1 Site Description ....................................................................... 4
  2.2 Technical Description ............................................................... 5
  2.3 Supplying Natural Gas pipeline .................................................. 6

3 Summary of due diligence activities ............................................. 7
  3.1 Meetings ................................................................................ 7
  3.2 Desk Review .......................................................................... 7
  3.3 Site Visits .............................................................................. 8

4 Power plant Compliance with World Bank/IFC Performance Standards ........ 10
  4.1 PS 1- Assessment and Management of Environmental and Social Risks and Impacts ........................................... 10
    4.1.1 Policy ............................................................................... 10
    4.1.2 Identification of risks and impacts ....................................... 10
    4.1.3 Management programs ....................................................... 10
    4.1.4 Organizational capacity and competency .............................. 11
    4.1.5 Emergency preparedness and response ................................. 11
    4.1.6 Monitoring and review ....................................................... 11
    4.1.7 Stakeholders engagement ................................................... 12
  4.2 PS 2- Labor and working conditions ......................................... 12
    4.2.1 Working Conditions and Management of Worker Relationship .... 12
    4.2.2 Occupational health and safety management .......................... 12
    4.2.3 Grievance mechanism ......................................................... 13
    4.2.4 Communication and training .............................................. 13
  4.3 PS 3- Resource Efficiency and Pollution Prevention ..................... 13
    4.3.1 Waste Disposal ................................................................. 13
    4.3.2 Air Emissions .................................................................... 13
4.3.3 Noise emissions ................................................................. 14
4.3.4 Water Supply .................................................................. 14
4.3.5 Wastewater Discharge ..................................................... 15
4.3.6 Hazardous Waste Generation and Management .................. 15
4.3.7 Energy Conservation ....................................................... 15
4.3.8 Water conservation ......................................................... 16
4.3.9 Contaminated land .......................................................... 16

4.4 PS 4- Community health and safety ..................................... 16
4.4.1 Spill Control and Management .......................................... 16
4.4.2 Structural Safety of project infrastructure ............................ 16
4.4.3 Traffic Safety .................................................................. 16
4.4.4 Grievance mechanism ...................................................... 17

4.5 PS 5- Land acquisition and involuntary resettlement .............. 17

4.6 PS 6- Biodiversity conservation and sustainable management of living natural resources .................................................. 17

4.7 PS 7- Indigenous People ...................................................... 17

4.8 PS 8- Cultural Heritage ........................................................ 18

4.9 WBG EHS Sector Guidelines for Thermal Power Plants ......... 18
4.9.1 Mitigation of air emissions ................................................ 18
4.9.2 Energy efficiency and GHG emissions ................................. 18
4.9.3 Thermal discharges ......................................................... 19
4.9.4 Solid wastes ................................................................... 19
4.9.5 Hazardous materials and oils .......................................... 19
4.9.6 Noise ........................................................................... 19
4.9.7 Occupational health and safety ........................................ 19
4.9.8 Monitoring emissions ...................................................... 20

4.10 WBG EHS General Guidelines ............................................ 20
4.10.1 Environmental ............................................................... 20
4.10.2 Occupational health and safety ....................................... 21
4.10.3 Community health and safety ........................................ 21
4.10.4 Construction and decommissioning ................................. 21

4.11 Summary of the Environmental and Social Findings ............... 23
5  Power plant Compliance with National Regulations ........................................ 24
6  Conclusions and recommendations ............................................................ 28
Annex I: Environmental Permit ...................................................................... 29
Annex II: Land Allocation Documents .......................................................... 34
Annex III: Environmental Practices Documents .......................................... 38
Annex IV: Meetings and Site Visit MOM ....................................................... 50
List of Figures

Figure 1 6th October Power Plant layout and boundaries ................................................. 4
List of Tables

Table 1 Summary of the reviewed and missing documents ........................................... 2
Table 2 Construction Activities and their timeframe ..................................................... 5
Table 3 Comparison of air emissions between turbine design and WB limits ............... 18
Table 4 Summary of the Environmental and Social findings ..................................... 23
Table 5 EEAA approval compliance status ................................................................. 24
Table 6 Corrective Action Plan .................................................................................... 28
### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEPC</td>
<td>Cairo Electricity Production Company</td>
</tr>
<tr>
<td>CTG</td>
<td>Combustion Turbine Generator</td>
</tr>
<tr>
<td>GTG</td>
<td>Gas Turbine Generator</td>
</tr>
<tr>
<td>EEAA</td>
<td>Egyptian Environmental Affairs Agency</td>
</tr>
<tr>
<td>EEHC</td>
<td>Egyptian Electricity Holding Company</td>
</tr>
<tr>
<td>EHS</td>
<td>Environmental Health and Safety</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EO</td>
<td>Environmental Officer</td>
</tr>
<tr>
<td>EPC</td>
<td>Engineering, Procurement and Construction</td>
</tr>
<tr>
<td>EPP</td>
<td>Existing Power Plant</td>
</tr>
<tr>
<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
</tr>
<tr>
<td>ESMS</td>
<td>Environmental and Social Management System</td>
</tr>
<tr>
<td>HRSG</td>
<td>Heat Recovery Steam Generator</td>
</tr>
<tr>
<td>IFC</td>
<td>International Finance Cooperation</td>
</tr>
<tr>
<td>LFO</td>
<td>Light Fuel Oil</td>
</tr>
<tr>
<td>MOM</td>
<td>Minutes of Meeting</td>
</tr>
<tr>
<td>MWe</td>
<td>Mega Watt electrical</td>
</tr>
<tr>
<td>NBE</td>
<td>National Bank of Egypt</td>
</tr>
<tr>
<td>OHTL</td>
<td>Over Head Transmission Line</td>
</tr>
<tr>
<td>PM</td>
<td>Particulate Matter</td>
</tr>
<tr>
<td>PS</td>
<td>Performance Standard</td>
</tr>
<tr>
<td>TSP</td>
<td>Total Suspended particles</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WBG</td>
<td>World Bank Guidelines</td>
</tr>
<tr>
<td>CO</td>
<td>Carbon Monoxide</td>
</tr>
<tr>
<td>NO₂</td>
<td>Nitrogen Dioxide</td>
</tr>
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</table>
1 EXECUTIVE SUMMARY

1.1 Scope and purpose of review

The Egyptian government is currently increasing the power generation capacity in the country. Therefore, a conversion of an existing Open Cycle power plant to combined cycle is proposed to be constructed in the 6th of October Power Plant located in the city of 6th October, Giza governorate. The Plant Owner is the Cairo Electricity Power Production Company (CEPC), a company affiliated to Egyptian Electricity Holding Company (EEHC).

The existing power plant (EPP) is situated in 6th October City in Abu Rawash area of Giza Governorate, in correspondence to the Kilometer 23 to East of the Cairo-Alexandria desert road. The nearest residential area to the Power Plant is at a distance of around 4 km, in addition to some scattered activities (residential and industrial) which is at a distance closer distance.

The original power plant project consisted of a 4 x 150 MW simple cycle Combustion Turbine Generators (CTGs), which were expanded with another 4 x 150 MW simple cycle CTGs fully operating since August 2015, increasing the total plant generation power to 1200 MW. The additional proposed expansion will turn 4 CTG modules into a combined cycle power plant, adding an additional 300 MW to the plant’s generation power. The original power plant operates on natural gas as a primary fuel and diesel as a backup fuel, and the expansion will operate on natural gas as well.

One of the other projects implemented to support the generation of electricity in Egypt is the EG-Giza North Power Project, which is financed by the World Bank. After the completion of the procurement of all the packages financed by the World Bank, there were financial savings available as part of the project to be utilized by the Government of Egypt. The World Bank received formal requests from the government of Egypt to utilize the financial savings of Giza North Power Plant project to procure natural gas pipelines in order to upgrade the natural gas network. One of these pipelines is 6th October gas pipeline which will feed 6th October power plant’s new expansion. One of the World Bank requirements to undertake an environmental and social due diligence to any associated facility to a bank-assisted project to ensure that it is conforming to the World Bank/ IFC Performance Standards. 6th October power plant is considered as an associated facility to 6th October gas pipeline project since it meets the World Bank criteria of identification of the associated facilities.

- Directly and significantly related to the Bank-assisted project (6th October gas pipeline project)
• Necessary to achieve the objectives of 6th October gas pipeline as set forth in the project documents; and

• Carried out contemporaneously with 6th October gas pipeline project.

This report was undertaken to check and identify the current and cumulative environmental and social impacts of the power plant. Moreover, it is required to ensure that the proposed/implemented environmental and social mitigation measures, including monitoring and reporting requirements are satisfactorily conforming to the World Bank/IFC Performance Standards. Accordingly, corrective measures are proposed when required.

1.2 Methodology

In order to achieve the due diligence objectives, the work methodology followed included conducting meetings with the relevant entities to gather the available data and documents related to the power plant, conducting desk review for the relevant project documents, in addition to conducting a visit to the power plant site with the purpose of updating the status of the environmental performance from the plant. The desk review was done to evaluate all the gathered documents and studies prepared for the power plant.

1.3 Status of requested project documentation

The following table summarizes the documents reviewed by due diligence consultant.

<table>
<thead>
<tr>
<th>Source</th>
<th>Reviewed Documents</th>
</tr>
</thead>
</table>
| EEHC                          | 1. ESIA of the power plant  
                                 | - ESIA main document                                                             |
|                               | 2. EEAA approval for the power plant                                            |
|                               | 3. Land Allocation Decree and Registration Document                            |
|                               | 4. Hazardous Waste Disposal Contract                                            |
| Site visit by the World Bank  | 1. Environmental Audit report (Done as part of the review process for plant extension finance) |
| Site Visit                    | 1. Sample of the stacks emissions monitoring report                            |
|                               | 2. Sample of the wastewater analysis before discharge to the network            |
|                               | 3. Plant Emergency Response Plan (during operation)                            |
|                               | 4. Contractor’s Safety plan (during construction)                              |
|                               | 5. Waste disposal receipts                                                      |
|                               | 6. Spill contingency measures P&ID                                                |
1.4 Power plant status

Based on the conducted assessment of the power plant, 6th October power plant’s extension is considered to be in compliance with the World/IFC Performance Standards. None of the comments found throughout the study may pose any environmental or social threats on the successful construction and operation of the power plant. However, the following recommendations need to be considered and implemented:

- Documentation and organization of the Environmental and Social Management System (ESMS) in a systematic approach should be carried out in accordance to the requirements of the PS 1.

- The stack emissions should include measuring total suspended particulates (As required by the Egyptian environmental standards).

- The plant should develop and carry out an annual GHG emissions accounting and reporting procedure in accordance with the requirements of PS 3.
2 PROJECT DESCRIPTION

2.1 Site Description

Cairo Electricity Production Company (CEPC) is the owner of the 6th October power plant. The site of the Existing Power Plant (EPP), its expansion and the planned 300 MW Combined Cycle PP are located in one site at km 23 Cairo – Alexandria Desert Road. The site is located in Giza Governorate; west of the Nile and Cairo City, and bounded by longitudes 31° 02’ 34.08” and 31° 02’ 53.73” E and latitudes 30° 03’ 4.34” and 30° 04’ 00” N.

The power plant is located in Abu Rawash industrial area; where the entrance of Plant is located along Abu Rawash Road. The land was allocated to the project by the presidential decree number 228 for the year 2007 as shown in Annex II.

To the north side of the site, there is a small farm, while to the South East side there is a barren desert land, as shown in Figure 1. The nearest protectorate to the power plant is El Hassana Dome which is about 3 Km from the power plant’s area.

![Figure 1 6th October Power Plant layout and boundaries](image-url)
2.2 Technical Description

The original 6th of October power plant project consisted of a 4 x 150 MW simple cycle Gas Turbine Generators (GTGs), which were expanded with another 4 x 150 MW simple cycle GTGs fully operating since August 2015, increasing the total plant generation power to 1200 MW. The additional proposed expansion will turn 4 CTG modules into a combined cycle power plant, adding an additional 300 MW to the plant’s generation power.

The power plant is firing natural gas as a primary fuel and diesel oil (light fuel oil) as an emergency fuel. The natural gas is supplied to the power plant through underground pipelines; while the emergency diesel oil is transported by trucks.

The combined cycle power plant (the subject of this study), after expansion, will consist of four gas turbines generators; each with a capacity of 150 MWe, heat recovery steam generators (HRSG) and one steam turbine generator of 300 MWe. The power plant extension is currently operating using air cooling, and the expansion will use the same method. The required water for service and HRSG will be supplied from the groundwater well and will be used after pre-treatment and demineralization to provide process water makeup in the HRSG system.

The wastewater generated from the plant is currently directed to the public sewer network after preliminary treatment. As per the ESIA, a sewage treatment plant will be included in the new phase, and the treated water will be used for irrigation.

The natural gas will be combusted in the gas turbines generating electricity and hot gases which will be directed to the heat recovery steam generators. The hot gases will boil the demineralized water in the HRSG producing steam which will generate electricity in the steam turbine generator. The exhaust steam from the steam turbine will be directed to a condenser which is cooled by air cooling system, and then recirculated to the HRSG. The generated electricity will be fed to the national unified grid via the 500 kV switchgear to the 500 kV Over Head Transmission Line (OHTL) network.

The construction program is planned to be completed within 36 months after construction commencement, and Table 2 shows a summary of the construction activities and their time schedule. It is worth noting that the contract for this expansion was signed in November 2015, however, during the site visit it was verified that the actual construction work started on November 2016.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description of Activities</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Start</td>
<td>Mobilization, establishment</td>
<td>Months 1-3</td>
</tr>
</tbody>
</table>

Table 2 Construction Activities and their timeframe
### Environmental and Social Due Diligence for 6th of October Power Plant

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Works</td>
<td>Establishment of temporary facilities, topsoil stripping, excavation, construction of site roads access, drainage, services, fencing.</td>
<td>Months 1-6</td>
</tr>
<tr>
<td>Earthworks, Piling and Foundations</td>
<td>Piling, establishment of base slabs, footings, pits and tanks.</td>
<td>Months 5-15</td>
</tr>
<tr>
<td>Steelwork</td>
<td>Construction of steel frames for buildings and support of plant.</td>
<td>Months 10-22</td>
</tr>
<tr>
<td>Major plant Installation</td>
<td>Installation of HRSGs, generators, etc.</td>
<td>Months 12-37</td>
</tr>
<tr>
<td>Mechanical and Electrical Installation</td>
<td>Installation of pipework, pumps, compressors, cooling water ducts, power cabling and switchgear process controls, HVAC, pumps, motors, fans heat exchangers,</td>
<td>Months 16-31</td>
</tr>
</tbody>
</table>

### 2.3 Supplying Natural Gas pipeline

The EPP already has a supplying Natural Gas pipeline which is just enough to operate the old existing equipment. But in order to ensure a steady supply for the extension of the plant, GASCO is planning to construct a new pipeline starting from Tanash/Dahshour existing gas pipeline, and ending at the 6th of October power plant Pressure reduction station. This Natural Gas supplying pipeline is the reason 6th of October pipeline is considered an associated facility to the current project package.
3 SUMMARY OF DUE DILIGENCE ACTIVITIES

In order to achieve the due diligence objectives, the work methodology followed included conducting meetings with the relevant entities to gather the available data and documents related to the power plant, conducting desk review for the relevant project documents, in addition to conducting a site visit to the power plant site. The desk review was done to evaluate all the gathered documents and studies prepared for the power plant.

3.1 Meetings

Three meetings were held with EEHC at different phases of the due diligence project. The detailed minutes of meetings can be found in annex 4 of the study, while this section contains a summary of the meetings findings.

The first meeting was held on 9/5/2016 for the purpose of gathering the available data and documents related to the 7 power plants fed by the natural gas pipelines financed by the World Bank (including 6th of October Power Plant). During the meeting EEHC ensured that all the power plants have already obtained the environmental approval from the Egyptian Environmental Affairs agency. Also, the social status of the power plants regarding the land acquisition aspect was discussed, and an agreement was made that EEHC will send to the due diligence consultant the EEAA approvals, lender approvals, land ownership documents, and the contact details of the focal points inside the electricity production companies to get more specific data about each power plant.

The second meeting held at EEHC on 24/5/2016 for the aim of gathering the available data and documents was mainly related to New Capital, El Burullus and Beni Suef Power Plants. Therefore, the meeting minutes were not added to this report.

The third meeting was held on 29/9/2016 for the purpose of discussing the status of the documents requested from EEHC. In this meeting, the due diligence consultant explained the list of the required information and the EEHC representative committed to supply the data that he can get within a week.

3.2 Desk Review

The due diligence activities included reviewing the national legal requirements pertinent to the construction and operation of power plants in Egypt. In addition to that, the World Bank requirements concerning the environmental limits and standards were investigated as well as the social requirements.
(i) **Power Plant ESIA Study**

The current project proponent is the Egyptian Electricity Holding Company (EEHC). The power plant will be a 900 MW capacity combined cycle power plant that is financed through the plant contractor (Ansaldo Energia), who will undertake the project activities as Engineering, Procurement and Construction (EPC) + Finance Package. The funding agencies are planned to be HSBC and locally the National Bank of Egypt (NBE).

The ESIA is prepared by independent experts not affiliated with the project in accordance with the national regulations and requirements, and the requirements of the World Bank/IFC Performance Standards, and IFC EHS guidelines as well as the Equator principles (2013). The power plant’s extension study has been presented and accepted by the EEAA.

(ii) **Applicable Egyptian laws and regulations**

The Environmental Egyptian Law 4 of 1994 amended by Laws 9/2009 and 105/2015 (with its executive regulations amended by Decree 1095/2011 710/2012 and 964/2015) specifies the applications for a license for any project. According to the law, a full EIA must be prepared for the power plant and submitted to Egyptian Environmental Affairs Agency (EEAA) for consideration.

The executive regulations of the environmental law specifies the limits for different environmental aspects as ambient air quality, air emissions from the power plants stacks during operation, management of hazardous and non-hazardous solid wastes, ambient noise levels, air and noise quality in the work environment and wastewater discharge regulations to aquatic or marine environments.

According to the guidelines issued by the EEAA for the preparation of the EIA studies, Power Plants are categorized as facilities under Category “C”, which requires the preparation of a full EIA study.

(iii) **Applicable World Bank regulations**

In addition to the Egyptian Regulations, the World Bank/IFC Performance Standards were also considered in the process of reviewing the ESIA study underhand, as well as the IFC’s General Environmental, Health and Safety (EHS) Guidelines and the EHS Guidelines for Thermal Power Plants.

3.3 **Site Visits**

The main 6th October power plant is already constructed, and so the aim is to transform the existing open cycle gas turbine power plant (4x150 MW open cycle) to be working with the combined cycle system which will add an extra 300 MW to the national network. A site visit was conducted before the first expansion of the 6th October power
plant (when the capacity was only 4*150 MWe) during the due diligence process supervised by the World Bank. The main findings were:

- All efforts need to be performed to reduce reliance on diesel fuel
- Industrial liquid sewage should be analyzed further
- A register of hazardous materials and wastes should be maintained
- An environmental register for the EPP needs to be prepared, maintained and regularly updated

Additionally, a site visit was conducted by the due diligence team on the 18th of January 2017 to update the environmental performance documents received and know the status of construction activities of the combined cycle extension. During the site visit, the due diligence team met the plant management, and the representatives of the environmental management team in the plant. The details of the visit proceedings are included in Annex 4, and the summary of the main findings is as follows.

The new combined cycle unit construction has recently started in November 2016, with a progress reaching around 11% mainly in the mobilization and civil works, with no equipment received yet. Also, the due diligence consultant was provided with some documents related to the environmental performance of the existing power plant.
4 POWER PLANT COMPLIANCE WITH WORLD BANK/IFC PERFORMANCE STANDARDS

This section includes the assessment of environmental and social aspects against the World Bank/IFC Performance Standards.

4.1 PS 1- Assessment and Management of Environmental and Social Risks and Impacts

The ESIA prepared for the power plant’s switch from simple cycle to combined cycle was found to be generally complying with the World Bank/IFC Performance Standards of PS 1, as shown in the following subsections:

4.1.1 Policy

The ESIA does not clearly mention the status of the policy at 6th October Power Plant; however, EEHC’s mission states that their power supplying service takes into consideration resources utilization and environment conservation. As EEHC is the holding company responsible for all the production companies (including CEPC), the mission is considered as the umbrella under which all the power plants are operating; thus EEHC’s mission is applicable to 6th October Power Plant. Furthermore, CEPC’s mission includes the conservation of the environment in light of the governing laws, and the care about the social and moral wellbeing of the workers, which is also applicable to 6th of October Power Plant. The due diligence team concludes that this is in compliance with the requirements of PS 1.

4.1.2 Identification of risks and impacts

The ESIA presents a thorough identification of the environmental and social impacts expected from the new project construction and operation. The due diligence team concludes that this is done in compliance with the requirements of PS 1.

4.1.3 Management programs

The ESIA presents an Environmental and Social Management Program for the main potential impacts and risks expected during the construction and operation phases of the power plant. In general, the Environmental Management system aspects are available onsite due to the previous experience of the plant management in operating similar projects. However, these aspects can be better organized and documented to match the requirements of the PS 1.
Recommendation:

Documentation and organization of the Environmental and Social Management System (ESMS) in a systematic approach should be carried out in accordance to the requirements of the PS 1.

4.1.4 Organizational capacity and competency

The ESIA mentions that an Environmental Officer (EO) will be appointed as part of the HSE department with one of the defined duties is to ensure that the monitoring plan is implemented in an appropriate method. The study also mentions that to this end, the officer will have all the necessary assistance from personnel in the different departments. During the site visit, the due diligence team met the Environmental officer onsite, and a number of the operation team members, from the discussions; it was evident that the team are well aware of the environmental aspects. Additionally, it was mentioned during the meeting that the plant has to train 25% of its working force each year in such a way that every staff member has received at least 1 training every 4 years. The due diligence team concludes that this matches with the requirements of PS 1.

4.1.5 Emergency preparedness and response

The ESIA states that an Emergency and accident response procedure will be established by the plant for the new expansion, which will be included in the operation manual, and all the employees will be trained about the appropriate response in case of emergency. Additionally, according to the site visit previously conducted by the World Bank, an emergency plan is in place mainly focusing on firefighting, and an updated version of the plan was received during the site visit (the cover page is shown in Annex 3). The due diligence team concludes that this matches with the requirements of PS 1.

4.1.6 Monitoring and review

The ESIA includes the monitoring activities as part of the environmental monitoring plan program for different aspects (Air quality, Noise, Solid Waste). It also includes the monitoring indicators and reporting frequency. During the site visit the due diligence team was provided with a number of performance reports including the emissions monitoring report, waste disposal evidence and Emergency response plan. The due diligence team concludes that this matches with the requirements of PS 1. However, the air emissions measurements from stacks did not include Total suspended particulates (TSP) as required by the Egyptian standards.

Recommendation:
The plant should include TSP as one of the monitored parameters for the stack emissions.

### 4.1.7 Stakeholders engagement

The received ESIA included a stakeholder engagement plan during the different phases of the project, as well as a grievance mechanism. However, it also mentions that until the time of the ESIA preparation, no public consultation activities were carried out, and that 2 public consultations will be carried out by the moment of the report preparation. During the site visit, this topic was discussed with the plant operators who mentioned that a public consultation was carried out for the project, during which CEPC discussed with the neighbouring communities the procedures for grievances submittal, and that to date no complaints were received. Additionally, the EEAA approval was issued for the plant expansion project in August 2015. The due diligence team concludes that this matches with the requirements of PS 1.

### 4.2 PS 2- Labor and working conditions

#### 4.2.1 Working Conditions and Management of Worker Relationship

The workers operating the extension of the power plant will be the same workers who are operating the existing power plant. The entire workforce is from the surrounding areas to the plant site with no further need for workers accommodation onsite. Those workers are aware of the project location, the potential hazards of the project and how to prevent any incidents; as they previously worked on similar projects and they all receive periodic training to ensure the adequacy of performance standard in the plant operation. As no new workforce was added to the project, the same communication and grievance mechanism currently being applied will be followed. The due diligence team concludes that this matches with the requirements of PS 2.

#### 4.2.2 Occupational health and safety management

The ESIA didn’t include an occupational health and safety plan for the construction phase. But according to the site visit previously conducted by the World Bank, a health and safety department exists in the EPP. An emergency plan is in place; mainly focusing on firefighting. The EPP staffs are all equipped with PPE’s and are mandated to use them in specific locations in the EPP, as was observed during the site visit. Furthermore, the contractor’s safety plan was reviewed onsite, and the cover page is included in Annex 3. The due diligence team concludes that this matches with the requirements of PS 2.
4.2.3 Grievance mechanism

The stakeholders of the power plant were identified through the ESIA to include the employees of the power plant. The ESIA included a grievance mechanism for the power plant’s stakeholders identifying the procedures of submitting comments and responding to them in addition to the development of a register to include these grievances. During the site visit, the due diligence team was informed that the workers have the right to submit any complaints to the plant manager and the sector head for their actions. The due diligence team concludes that this matches with the requirements of PS 2.

4.2.4 Communication and training

Based on the ESIA, the workers will undergo environmental and social training in several areas like operation of the power plant, occupational health and safety and contingency plans, and this was verified during the site visit, as the management is committed to train at least 25% of the workforce each year, without repetition. Additionally, the current plant operator’s experience will be utilized during the construction and operation of the new expansion. The due diligence team concludes that this matches with the requirements of PS 2.

4.3 PS 3- Resource Efficiency and Pollution Prevention

4.3.1 Waste Disposal

The handling methods for the solid waste generated from the 6th October power plant were specified in the ESIA. The ESIA mentioned that the final disposal of wastes will be to the waste management facilities under the control of the local authorities. According to the site visit previously conducted by the World Bank, the solid wastes generated from the construction activities are collected and disposed of via the Construction Contractor (Ansaldo), while the existing plant waste is disposed of through the local authority contractors to the public disposal sites. The waste disposal receipts are included in Annex 3 of this report. The due diligence team concludes that this matches with the requirements of PS 3.

4.3.2 Air Emissions

The proposed expansion in the ESIA does not involve the addition of new combustion turbine generators; instead it only includes the conversion from simple cycle to combined cycle mode. Accordingly, no ambient air measurements were specifically performed as part of the ESIA, and only old data representing the ambient air quality in 6th of October governorate was used. Additionally, an air dispersion model was conducted to predict the air quality at the project area during the full operation of the power plant.
The air model results for NOx, SO2, CO and PM10 predicted that the overall concentrations of these pollutants in the project area will be within the Egyptian limits and the World Bank limits.

During the site visit previously conducted by the World Bank, the air emissions data were investigated and the recorded values were within permissible environmental limits. In addition, the EPP combustion turbine generators have an installed CEMS which is connected to the EEAA air monitoring system.

While during the site visit conducted by the due diligence team, the plant provided stacks emissions monitoring reports, the emission data were found to be within the acceptable limits considering that the plant is operating with LFO and natural gas because the existing natural gas fuel supply does not cover the 8 CTGs. The acquired stack emission reports are included in annex 3. However, the reports did not include Total suspended particulates or Particulate Matter (As required by the Egyptian limits and World Bank limits).

Recommendation:

The stack emissions should include measuring total suspended particulates (As required by the Egyptian standards).

4.3.3 Noise emissions

According to the ESIA, a noise campaign was carried out at 3 receptors in order to identify the baseline noise level of the proposed project area. The results showed that there is a significant existing noise at the area of the power plant mostly due to the movement of vehicles on the surrounding roads, and the industrial activities. However, the measured noise levels are still complying with the limits of the Egyptian regulations and the World Bank. The due diligence team concludes that this matches with the requirements of PS 3.

4.3.4 Water Supply

Based on the ESIA, the water supply to 6th October power plant will be sourced from a groundwater well located in the plant, in addition to the national water supply network, which will be used for the operation of the plant expansion. While, the adopted cooling system is air cooling, this means that less water will be used for the plant operation. On the other hand, the source of potable water will be through the national network water supply.

According to the site visit previously conducted by the World Bank, the EPP mainly relies on 2 wells located inside the plant’s area. These wells are used to obtain de-mineralized water to be used in the washing systems of the gas turbines/compressors and fuel oil.
and chemical laboratory in addition to fire/services uses, and in the future it is planned
that the same water source will be used for the operation of the steam system in the
combined cycle power plant. The potable water used in the civil uses is supplied by the
public network. The due diligence team concludes that this matches with the
requirements of PS 3.

4.3.5 Wastewater Discharge

The ESIA stated that the sewage wastewater and industrial wastewater during the
operation of the power plant will be used for irrigation purposes in the plant after being
treated in the on-site treatment facility. Currently, the treated waste water is directed to
the public sewer network after treatment onsite.

According to the site visit previously conducted by the World Bank, wastewater from
neutralization system is directly sent to the sewer collecting pit and then discharged to
the local sewage system. Wastewater from civil uses is sent to a sanitary pit and then to
the sewer collecting pit before being discharged into the public sewage system, samples
of the wastewater analysis before discharge into the network is included in Annex 3. The
due diligence team concludes that this matches with the requirements of PS 3.

4.3.6 Hazardous Waste Generation and Management

Although a natural gas power plant does not produce significant amounts of waste, the
ESIA mentioned the procedures for storing and transporting the hazardous waste.

According to the site visit previously conducted by the World Bank, the hazardous
wastes generated from EPP are mainly the empty chemical containers and florescent
lamps. These types of wastes are shipped to the temporary storage site of CEPC in
Heliopolis/Cairo.

Based on communication with EEHC, the due diligence team received a hazardous waste
contract for the disposal of the hazardous waste between CEPC and the official
hazardous waste landfill site in Al-Nassreya/Alexandria as shown in annex 3. The due
diligence team concludes that this matches with the requirements of PS 3.

4.3.7 Energy Conservation

The existing power plant is fueled by natural gas, with diesel used as a back-up system.
The proposed plant expansion, from simple cycle to combined cycle, is particularly well
suited for covering the peak demand of electric energy, especially that it utilizes the
fossil fuels already used to produce a larger amount of energy through the heat recovery
steam generators and the steam turbine generators operation; thus enhancing the
overall efficiency of the power plant. The due diligence team concludes that this
matches with the requirements of PS 3.
4.3.8 Water conservation

As mentioned above, the choice of utilizing an air cooling system will help in preserving large amount of water compared to water cooling systems. Also, for the new combined cycle operation mode, the steam cycle will operate in a closed cycle mode with the need of make-up water. The due diligence team concludes that this matches with the requirements of PS 3.

4.3.9 Contaminated land

Based on the ESIA, specific measures should be applied to prevent any incidental spills or leaks to the soil. These measures include adequate secondary containment to all the areas in addition to implementation of comprehensive waste management procedures in order to properly manage and dispose the waste. The due diligence team concludes that this matches with the requirements of PS 3.

4.4 PS 4- Community health and safety

4.4.1 Spill Control and Management

The ESIA included the development of an oil spill contingency plan as part of the mitigation measures for groundwater pollution prevention. During the site visit, the due diligence team was informed that all the transformers have oil spill containment areas, with a network of pipes collecting the leaked oil in an oil trap where the oil is separated from wastewater, then the oil is collected by a contractor and the wastewater goes to the chemical treatment plant. The flow diagram for the oil spill collection system is included in annex 3.

4.4.2 Structural Safety of project infrastructure

Taking into account that the project is an extension of an existing power plant, the existing infrastructures are considered adequate for the requirements of the project and include administrative buildings, site services, lighting, access roads and security/visitor gatehouse. The due diligence team concludes that this matches with the requirements of PS 4.

4.4.3 Traffic Safety

Minor traffic impacts will exist only in the construction phase through the delivery of the construction material and equipment to the site via Cairo-Alexandria desert road. The transportation of material and equipment to the project site will cause temporary increase in traffic along the roads. The due diligence team concludes that this matches with the requirements of PS 4.
4.4.4 Grievance mechanism

As mentioned above, the grievance mechanism mentioned in the ESIA is set for all the stakeholders of the power plant identifying the procedures of submitting comments and responding to them in addition to the development of a register to include these grievances. Additionally, during the discussion with the plant operators, it was mentioned that during the public consultation for the plant extension this mechanism was communicated to the stakeholders and that no complaints were received to date. The due diligence team concludes that this matches with the requirements of PS 4.

4.5 PS 5- Land acquisition and involuntary resettlement

The power plant extension will be within the boundaries of the existing EPP which was allocated to CEPC by the Presidential Decree 228/2007 and was originally a state owned land containing a governmental high voltage research center. Therefore, there are no social issues or claims as the development of the power plant did not include any land acquisition and did not affect any local community.

The land originally belongs to Giza Governorate and is allocated by the means of a Presidential Decree 228/2007 to the custody of EEHC. The land is then re-allocated to CEPC (As shown in Annex II). Accordingly, no social issues or claims were recorded due to the location of the EPP which is located within/bordering an industrial park in Abu-Rawash and the nearest residential area is characterized by very low population density. The due diligence team concludes that this matches with the requirements of PS 5.

4.6 PS 6- Biodiversity conservation and sustainable management of living natural resources

The project is part of an existing power plant (EPP) with the aim to increase the power generation capacities in Egypt through the conversion of an existing Open Cycle to combined cycle. Very limited animal and plant species were traced around the site. This area is an open sandy sheet, mostly without vegetation and with not more than 5% plant cover; most of the species are drought tolerant to this habitat. Therefore, the project site does not comprise threatened, near-threatened, or endangered species. Accordingly, the due diligence team concludes that this satisfies with the requirements of PS 6.

4.7 PS 7- Indigenous People

No indigenous people are found in the project area, so this performance standard does not apply.
4.8 PS 8- Cultural Heritage

The project is an extension of the existing 6th October Power Plant, and will be constructed in the same vicinity as the EPP. There are no cultural heritage or tourist areas located near the study area. According to the ESIA, the nearest archeological site is about 3 km away from the EPP and is not open for tourism purposes. It is still under exploration and archeological studies are ongoing.

4.9 WBG EHS Sector Guidelines for Thermal Power Plants

The power plant’s status was checked and compared to the WB guidelines for thermal power plants. All the guidelines were covered and checked through the review with the performance standards.

4.9.1 Mitigation of air emissions

Although the ESIA scope was mainly turning 4 of the simple cycle units into a combined cycle system, the ESIA included an air dispersion model for the whole plant, including the emission rate expected from all the combustion turbine generators. The following table shows a comparison between the air emissions limits in the guidelines and the design parameters for the turbines. The table shows that the design values comply with the World Bank limits.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Turbine design</th>
<th>World Bank limits (mg/Nm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value, mg/m³</td>
<td>Natural Gas</td>
<td></td>
</tr>
<tr>
<td>NOx</td>
<td>~33.5</td>
<td>51</td>
</tr>
<tr>
<td>SO2</td>
<td>3 - 40</td>
<td>N/A</td>
</tr>
<tr>
<td>TSP&amp;PM10</td>
<td>~11</td>
<td>N/A</td>
</tr>
<tr>
<td>CO</td>
<td>0 – 14.5</td>
<td>Not Specified</td>
</tr>
</tbody>
</table>

Regarding the mitigation of the air emissions from the power plant, specific measures will be applied during the operation of the power plant. Low NOx combustors will be used in addition to that the stack height is 35m to allow good dispersion to the surroundings.

4.9.2 Energy efficiency and GHG emissions

CO₂ is considered the main GHG emitted during the construction activities of the power plant and from fuel combustion during the operation phase. The suggested project as per the ESIA is to utilize a combined cycle power plant as a modification to the simple
cycle system currently in operation, also using natural gas as the primary fuel will help in minimizing the CO₂ emissions from the power plant.

Based on the ESIA, the CO₂ emissions expected to generate from the total power plant are 554 g/KWh. As per WBG EHS Sector Guidelines for Thermal Power Plants, the typical CO₂ emissions performance for a combined cycle power plant firing natural gas is 34% with CO₂ emissions of 594 g/KWh.

During the site visit, the due diligence team was informed that currently no GHG accounting system is carried out for the plant, however it is one of the requirements requested by the Italian bank financing the new combined cycle extension therefore it is expected to be developed soon.

**Recommendation:**

The plant should develop and carry out an annual GHG accounting and reporting procedure in accordance with the requirements of PS 3.

### 4.9.3 Thermal discharges

The power plant will operate on an air cooling system, with no cooling water intake or discharge. Accordingly, no thermal discharge is expected from the plant operation.

### 4.9.4 Solid wastes

Covered in section 4.3.1

### 4.9.5 Hazardous materials and oils

Covered in section 4.3.6

### 4.9.6 Noise

According to the ESIA, specific design measures were applied to mitigate the noise emissions during the construction and operation of the power plant. These measures include the utilization of sound proof enclosures for turbines and using Personal Protective Equipment in places of high noise levels.

### 4.9.7 Occupational health and safety

Covered in section 4.2.2.
4.9.8 Monitoring emissions

Based on the ESIA, regarding the emissions monitoring during the operation of the power plant, all the stacks will be connected to the national Continuous Emissions Monitoring System (CEMS), which is also connected to the EEAA, for a better control of the emissions during operation. Additionally, ambient air quality shall be monitored quarterly by active sampling and the measurements for PM10, SO2, CO, NOx taken at the same locations of the baseline study that should be developed at the power plant’s area.

During the site visit, the due diligence team was provided with recent examples of the stack measurements, and they are included in annex 3. It was found that all the results comply with the National Egyptian standards and World Bank standards. However, the measurements did not include Total suspended particulates or Particulate Matter (As required by the Egyptian standards and World Bank standards).

4.10 WBG EHS General Guidelines

4.10.1 Environmental

(i) Air emissions and ambient air quality
Covered in section 4.3.2

(ii) Energy conservation
Covered in sections 4.3.7 and 4.9.2

(iii) Wastewater and ambient water quality
Covered in section 4.3.5

(iv) Water conservation
Covered in section 4.3.8

(v) Hazardous materials management
Covered in section 4.3.6

(vi) Waste management
Covered in section 4.3.1

(vii) Noise
Covered in section 4.3.3 and 4.9.6

(viii) Contaminated land
Covered in section 4.3.9
4.10.2 Occupational health and safety

(i) General facility design and operation
Covered in section 4.2.2, 4.4.1 and 4.4.2

(ii) Communication and training
Covered in section 4.2.4

(iii) Hazards
Covered in sections 4.2.2 and 4.4.1

(iv) Personal protective equipment
Covered in section 4.2.2

(v) Special hazard environments
Covered in section 4.2.2

(vi) Monitoring
Covered in section 4.1.6

4.10.3 Community health and safety

(i) Water quality and availability
Covered in section 4.3.4

(ii) Structural safety of project infrastructure
Covered in section 4.4.2

(iii) Life and fire safety (L&FS)
Covered in section 4.2.2

(iv) Traffic safety
Covered in section 4.4.3

(v) Transport of hazardous materials
Covered in sections 4.3.1 and 4.3.5

(vi) Disease prevention
No issues anticipated

(vii) Emergency preparedness and response
Covered in section 4.2.2

4.10.4 Construction and decommissioning

(i) Environment
This was covered in the abovementioned guidelines. The due diligence team concludes that this matches with the WBG EHS guidelines.

(ii) Occupational health and safety
This was covered in the abovementioned guidelines. The due diligence team concludes that this matches with the WBG EHS guidelines.

(iii) **Community health and safety**
This was covered in the abovementioned guidelines. The due diligence team concludes that this matches with the WBG EHS guidelines.
4.11 Summary of the Environmental and Social Findings

The due diligence team concluded that 6th October Power Plant is considered to be in compliance with the World Bank/IFC Performance Standards. However, minor issues are identified, which do not pose any risks to the construction and operation. The following table summarizes the main comments and recommendations.

Table 4 Summary of the Environmental and Social findings

<table>
<thead>
<tr>
<th>Item</th>
<th>Aspect</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PS 1- Assessment and Management of Environmental and Social Risks and Impacts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Management Programs</td>
<td>The Environmental Management system aspects are available onsite due to the previous experience of the plant management in operating similar projects. However, these aspects can be better organized and documented to match the requirements of the PS 1.</td>
</tr>
</tbody>
</table>

**PS 3- Pollution prevention and abatement**

<table>
<thead>
<tr>
<th>Item</th>
<th>Aspect</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Air emissions</td>
<td>The acquired stack emission reports did not include Total suspended particulates or Particulate Matter (As required by the Egyptian standards and World Bank standards).</td>
</tr>
<tr>
<td>2.</td>
<td>Energy Conservation</td>
<td>The due diligence team was informed that currently no GHG accounting system is carried out for the plant, however it is one of the requirements requested by the Italian bank financing the new combined cycle extension, therefore it is expected to be developed soon.</td>
</tr>
</tbody>
</table>
The review of the power plant’s documents and the site visit conducted to the plant’s site by the World Bank showed that the power plant is complying with the national laws and regulations.

An ESIA for the power plant was prepared in accordance with the national regulations and requirements and submitted for EEAA for approval. The approval of EEAA for the combined cycle power plant extension was issued on 10/08/2015, and presented in Annex 1 of this report.

Based on the documents’ review and the site visit, the power plant’s design and construction activities comply with the limits and standards specified in the executive regulations of the environmental law for different environmental aspects. This includes ambient air quality, air emissions from the power plants stacks during operation, management of hazardous and non-hazardous solid wastes, ambient noise levels, air and noise quality in the work environment and wastewater discharge regulations.

Regarding the land acquisition of the power plant’s site, as mentioned above, the land originally belongs to Giza Governorate and is allocated by the means of a Presidential Decree 228/2007 to the custody of EEHC. The land is then re-allocated to CEPC. Accordingly, no social issues or claims were recorded due to the location of the EPP which is located within/bordering an industrial park in Abu-Rawash and the nearest residential area is characterized by very low population density.

The national regulations also include issuing the key permits required for the construction and operation of the power plant. The due diligence team has received the environmental permit shown in annex (1) for review. In addition, the due diligence team has received the land allocation documents including the presidential decree (Annex 2). In addition the EIA study for the power plant’s OHTL was already submitted by the Egyptian Electricity Transmission Company (EETC) and the EEAA approval was acquired.

As part of assessing the project compliance with local laws and regulations, the due diligence team checked the EEAA approval conditions and evaluated the compliance status as shown in the following table.

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
<th>Compliance status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Committing to the use of Natural Gas as the main fuel for the boilers used in the plant, and using Light Fuel Oil (solar) as a secondary fuel in case of emergency only</td>
<td>In progress: This will be applied on operating the power plant, especially when the new Natural Gas pipeline is in place</td>
</tr>
<tr>
<td></td>
<td>Commitment Details</td>
<td>Compliance Details</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>and within the limit of 2% of the annual operating hours (with a maximum of 7 days) as mentioned in the EIA study.</td>
<td>to ensure a stable supply of fuel.</td>
</tr>
<tr>
<td>2</td>
<td>Committing to the submission of a scoped EIA study for the Electricity Transmission Lines linked to the Power Plant before any connections to the electricity grid.</td>
<td><strong>Complying:</strong> During the site visit it was mentioned that the already existing OHTLs have acquired the EEAA approval, and that a new connection line is still in the planning phase, so the exact path is not finalized yet.</td>
</tr>
<tr>
<td>3</td>
<td>Periodical and continual update of the Qualitative and Quantitative Risk assessment studies (QRA), and delivering continuous training to the specialized workers.</td>
<td><strong>Complying:</strong> The power plant operators are aware of the risks of operating the plant from previous experience. Also continuous training is scheduled for the workers as needed.</td>
</tr>
<tr>
<td>4</td>
<td>Committing to the installation of Continuous Emissions Monitoring System (CEMS) for the stacks emissions, and linking them to the National Monitoring Network.</td>
<td><strong>Complying:</strong> The already operating units are connected to the CEMS, and accordingly it is planned that the new stack will be connected too.</td>
</tr>
<tr>
<td>5</td>
<td>Committing that the cumulative pollution load of the ambient air pollutants in the area does not exceed the limits set by the executive regulations amended by decree 1095/2011 and in accordance with the measurements included in the study.</td>
<td><strong>Complying:</strong> According to the mitigation measures mentioned in the design (discussed in section 4.9.1, the power plant is complying with this condition.</td>
</tr>
<tr>
<td>6</td>
<td>Commitment to the use of air cooled condenser system to the suggested expansions as mentioned in the study, and in case of using water in the cooling process; it has to be approved by the EEAA.</td>
<td><strong>Complying:</strong> According to the mitigation measures mentioned in the design (discussed in section 0), the power plant is complying with this condition.</td>
</tr>
<tr>
<td>7</td>
<td>Abiding by the maximum permissible ambient air pollutants levels in accordance with annex 5 of the executive regulations amended by Decree 1095/2011 with limiting the amount of gaseous pollutants.</td>
<td><strong>Complying:</strong> According to the mitigation measures mentioned in the design (discussed in section 4.9.1), the power plant is complying with this condition.</td>
</tr>
<tr>
<td>8</td>
<td>Committing to the maximum permissible noise levels in accordance with annex 7 of</td>
<td><strong>Complying:</strong> Mitigation measures are taken to</td>
</tr>
<tr>
<td></td>
<td>Commitment to not exceed the maximum permissible pollutant levels inside the work environment in accordance with annex 8 of the executive regulations amended by decree 1095/2011, while limiting the emitted Nitrogen Oxides (NOx) emissions through the use of low NOx emitting combustibles as mentioned in the study.</td>
<td>Complying: Taken in consideration during construction and operation phase of the current plant as well as the new extension operation starts (as mentioned in sections 4.3.2 and 0).</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9</td>
<td>Environmentally sound and safe disposal of the used hazardous materials in accordance to article 31 of the executive regulations amended by decree 1095/2011 and keeping the Material Safety Data Sheets (MSDS) for all the chemicals used.</td>
<td>Complying: The wastes are disposed of in the hazardous waste landfill, with the disposal contract included in annex 3 (as mentioned in section 4.3.6)</td>
</tr>
<tr>
<td>10</td>
<td>Environmentally safe and proper disposal of the hazardous wastes resulting from the activities (Filters, used oil and grease resulting from the operation and maintenance activities, and sludge resulting from water treatment plant) in accordance with the laws and regulations as mentioned in the study and in compliance with article 28 of the executive regulations amended by decree 1095/2011 and decree 964/2015.</td>
<td>Complying: The wastes are disposed of in the hazardous waste landfill, with the disposal contract included in annex 3 (as mentioned in section 4.3.6), and the wastewater is currently directed to the public sewage network.</td>
</tr>
<tr>
<td>11</td>
<td>Committing to the installation of the required stack in accordance to article 42 of the executive regulations amended by decree 1095/2011 and decree 964/2015, with the use of burners for NOx emissions.</td>
<td>In progress: Taken into consideration within the design phase, and will be implemented during the construction phase of the new extension</td>
</tr>
<tr>
<td>12</td>
<td>Commitment that the cooling processes is through air as mentioned in the study.</td>
<td>In progress: The existing plant units already operate using air-cooling process, and the same method is planned to be utilized in the plant extension.</td>
</tr>
<tr>
<td>13</td>
<td>Abiding to the maximum permissible limit for exposure to electromagnetic waves in accordance with the regulations of the</td>
<td>In progress: Taken into consideration within the design phase, and will be</td>
</tr>
<tr>
<td></td>
<td>Environmentally safe and proper disposal of the solid waste resulting from the construction and operation over regular intervals.</td>
<td>Complying: The construction in the new plant extension has just started in November 2016, and the current waste disposal methods are discussed in sections 4.3.1 and 4.3.6.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15</td>
<td>Abiding by the Environmental and Social Monitoring Plan and registering the results of the measurements and analysis in the environmental register, which should be available in case of environmental auditing.</td>
<td>Complying: The same monitoring and registering methodology followed in the existing plant will be extended to include the new plant extension.</td>
</tr>
<tr>
<td>16</td>
<td>Commitment from the company to achieve societal consensus and increasing the social participation during the construction and operation periods.</td>
<td>In progress: The plant operators are in continuous contact with the surrounding society and a grievance mechanism is in place (as discusses in section 4.4.4)</td>
</tr>
<tr>
<td>17</td>
<td>Preparing an Environmental Register to include all the results of the periodical monitoring from the combustion unit and the hazardous waste disposal register in accordance with article 33 of annex 3 and table 2 of the executive regulations amended by decree 1095/2011, and ensuring the availability of the register during environmental audits.</td>
<td>Complying: The same monitoring and registering methodology followed in the existing plant will be extended to include the new plant extension.</td>
</tr>
</tbody>
</table>
6 CONCLUSIONS AND RECOMMENDATIONS

Based on the review of the plant’s documents, 6th October power plant extension is considered to be in compliance with the World Bank/IFC Performance Standards. None of the comments mentioned in the previous section may pose any environmental or social threats on the successful construction and operation of the power plant. However, the following recommendations need to be considered and implemented within the proposed time frame as shown in the following table:

Table 6 Corrective Action Plan

<table>
<thead>
<tr>
<th>Item</th>
<th>Aspect</th>
<th>Required action</th>
<th>Time frame</th>
<th>Verification method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Management Programs</td>
<td>Documentation and organization of the Environmental and Social Management System (ESMS) in a systematic approach should be carried out in accordance to the requirements of the PS 1.</td>
<td>2nd quarter of 2017</td>
<td>Receiving the ESMS data</td>
</tr>
<tr>
<td>2.</td>
<td>Air Emissions</td>
<td>The stack emissions should include measuring total suspended particulates (As required by the Egyptian standards).</td>
<td>By the end of the 2nd quarter of 2017</td>
<td>Receiving air emissions report</td>
</tr>
<tr>
<td>3.</td>
<td>Energy Conservation</td>
<td>The plant should develop and carryout an annual GHG accounting and reporting procedure in accordance with the requirements of PS 3.</td>
<td>2nd quarter of 2017</td>
<td>Issuing of the annual report</td>
</tr>
</tbody>
</table>
Figure A- 1 EEAA approval 6th of October Power Plant Extension to Combined Cycle (1)
Environmental and Social Due Diligence for 6th of October Power Plant Extension to Combined Cycle (2)

Figure A. 2: EEAA approval 6th of October Power Plant Extension to Combined Cycle (2)
Mr. Engineer/ Gaber Desouki Mostafa  
Chairman of the Egyptian Electricity Holding Company  

After Greetings,

With reference to the letter received from the Member of the Board of Directors dated 14/06/2015 to which was attached the Environmental study regarding the project named “Extensions in 6th of October Power Plant Project (4 x 150 MW)” and that’s by transforming it from single cycle mode (Combustion Gas Turbines) into combined cycle mode by adding (1 x 300 MW), presented by/ Cairo Power Company, at the Address/ Abu-Rawash Power Plant, Abu-Rawash area, Giza.

We would like to inform you that after revising and evaluating the delivered environmental impact assessment study, the EEAA **approves** the submitted project, with the condition of abiding by all the specifications and procedures mentioned in the Environmental Impact/ Assessment (EIA) study submitted to the EEAA, and to all the rules, conditions, and standards stated in law no. 4 /1994 amended by law no. 9 /2009 and the executive regulations amended by decree 1095/2011, decree 710/2012 and decree 964/2015 **while committing to the following conditions:**

1. Committing to the use of Natural Gas as the main fuel for the boilers used in the plant, and using Light Fuel Oil (solar) as a secondary fuel in case of emergency only and within the limit of 2% of the annual operating hours (with a maximum of 7 days) as mentioned in the EIA study.

2. Committing to the submission of a scoped EIA study for the Electricity Transmission Lines linked to the Power Plant before any connections to the electricity grid.

3. Periodical and continual update of the Qualitative and Quantitative Risk assessment studies (QRA), and delivering continuous training to the specialized workers.

4. Committing to the installation of Continuous Emissions Monitoring System (CEMS) for the stacks emissions, and linking them to the National Monitoring Network at the EEAA at the cost of the company in accordance with the technical specifications set by the EEAA.
5. Committing that the cumulative pollution load of the ambient air pollutants in the area does not exceed the limits set by the executive regulations amended by decree 1095/2011 and in accordance with the measurements included in the study.

6. Commitment to the use of air cooled condenser system to the suggested expansions as mentioned in the study, and in case of using water in the cooling process; it has to be approved by the EEAA.

7. Abiding by the maximum permissible ambient air pollutants levels in accordance with annex 5 of the executive regulations amended by Decree 1095/2011 with limiting the amount of gaseous pollutants.

8. Committing to the maximum permissible noise levels in accordance with annex 7 of the decree 1095/2011.

9. Commitment to not exceed the maximum permissible pollutant levels inside the work environment in accordance with annex 8 of the executive regulations amended by decree 1095/2011, while limiting the emitted Nitrogen Oxides (NOx) emissions through the use of low NOx emitting combustibles as mentioned in the study.

10. Environmentally sound and safe disposal of the used hazardous materials in accordance to article 31 of the executive regulations amended by decree 1095/2011 and keeping the Material Safety Data Sheets (MSDS) for all the chemicals used.

11. Environmentally safe and proper disposal of the hazardous wastes resulting from the activities (Filters, used oil and grease resulting from the operation and maintenance activities, and sludge resulting from water treatment plant) in accordance with the laws and regulations as mentioned in the study and in compliance with article 28 of the executive regulations amended by decree 1095/2011 and decree 964/2015.

12. Committing to the installation of the required stack in accordance to article 42 of the executive regulations amended by decree 1095/2011 and decree 964/2015, with the use of burners for NOx emissions.

13. Commitment that the cooling processes is through air as mentioned in the study.
14. Abiding to the maximum permissible limit for exposure to electromagnetic waves in accordance with the regulations of the International Commission on Non-ionizing Radiation Protection (ICNIRP).

15. Environmentally safe and proper disposal of the solid waste resulting from the construction and operation over regular intervals.

16. Abiding by the Environmental and Social Monitoring Plan and registering the results of the measurements and analysis in the environmental register, which should be available in case of environmental auditing.

17. Commitment from the company to achieve societal consensus and increasing the social participation during the construction and operation periods.

18. Preparing an Environmental Register to include all the results of the periodical monitoring from the combustion unit and the hazardous waste disposal register in accordance with article 33 of annex 3 and table 2 of the executive regulations amended by decree 1095/2011, and ensuring the availability of the register during environmental audits.

This approval is from the environmental perspective only without breaching any other laws, rules or regulations related to this activity, and in case of non-compliance with any of the requirements mentioned above, this approval will be considered invalid, and the company will bear its responsibility towards any environmental damages.

Chief Executive Officer

(Eng. Ahmed Abou El-Seoud)
ANNEX II: LAND ALLOCATION DOCUMENTS

Figure A-3: Presidential Decree for the 6th of October Power Plant land allocation (1)
Figure A- 4 Registration of land allocation decree for the 6th of October Power Plant (1)
Figure A-5 Registration of land allocation decree for the 6th of October Power Plant (2)
Figure A- 6 Registration of land allocation decree for the 6th of October Power Plant (3)
Figure A- 7 Operation Emergency Response Plan Cover page
Figure A-8 Construction Contractor Safety Plan Cover page
Figure A-9 Examples of the Solid Waste Disposal Receipts (1)
Figure A-10 Examples of the Solid Waste Disposal Receipts (2)
Figure A-11 Examples of the Stack emissions report for November 2016
### Figure A-12 Examples of the Stack emissions report for December 2016

#### Table 1: Monthly Emissions of 6th of October Power Plant

<table>
<thead>
<tr>
<th>ITEM/UNIT</th>
<th>SPEC. For Solar</th>
<th>U1</th>
<th>U2</th>
<th>U3</th>
<th>U4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (M.W)</td>
<td></td>
<td>341</td>
<td>148</td>
<td>132</td>
<td>144</td>
</tr>
<tr>
<td>O₂ (%)</td>
<td></td>
<td>13.5</td>
<td>13.1</td>
<td>14.8</td>
<td>13.9</td>
</tr>
<tr>
<td>FLOW gas temp. C</td>
<td></td>
<td>550</td>
<td>551</td>
<td>548</td>
<td>552</td>
</tr>
<tr>
<td>CO (mg/m³)</td>
<td>&lt;250 (mg/m³)</td>
<td>28</td>
<td>17</td>
<td>32</td>
<td>44</td>
</tr>
<tr>
<td>NO₂ (mg/m³)</td>
<td>&lt;500 (mg/m³)</td>
<td>30</td>
<td>51</td>
<td>24</td>
<td>61</td>
</tr>
<tr>
<td>SO₂ (mg/m³)</td>
<td>&lt;1300 (mg/m³)</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>1.3</td>
</tr>
</tbody>
</table>

#### Table 2: Monthly Emissions of 8th of October Power Plant

<table>
<thead>
<tr>
<th>ITEM/UNIT</th>
<th>SPEC. For Solar</th>
<th>U5</th>
<th>U6</th>
<th>U7</th>
<th>U8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (M.W)</td>
<td></td>
<td>139</td>
<td>140</td>
<td>138</td>
<td>146</td>
</tr>
<tr>
<td>O₂ (%)</td>
<td></td>
<td>14.1</td>
<td>14.9</td>
<td>15.2</td>
<td>15.1</td>
</tr>
<tr>
<td>FLOW gas temp. C</td>
<td></td>
<td>549</td>
<td>552</td>
<td>530</td>
<td>548</td>
</tr>
<tr>
<td>CO (mg/m³)</td>
<td>&lt;250 (mg/m³)</td>
<td>21</td>
<td>32</td>
<td>50</td>
<td>34</td>
</tr>
<tr>
<td>NO₂ (mg/m³)</td>
<td>&lt;500 (mg/m³)</td>
<td>43</td>
<td>25</td>
<td>62</td>
<td>41</td>
</tr>
<tr>
<td>SO₂ (mg/m³)</td>
<td>&lt;1300 (mg/m³)</td>
<td>2.2</td>
<td>1.5</td>
<td>13</td>
<td>1.2</td>
</tr>
</tbody>
</table>

*All units are measured in milligrams per cubic meter.*
Environmental and Social Due Diligence for 6th of October Power Plant

Figure A - 13. Hazardous waste disposal Contract with Hassana landfill (1)
Figure A-14 Hazardous waste disposal Contract with Nassrya landfill (2)
Environmental and Social Due Diligence for 6th of October Power Plant

Figure A-15 Hazardous waste disposal Contract with Nassrya landfill (3)
Environmental and Social Due Diligence for 6th of October Power Plant
Figure A-17 Hazardous waste disposal Contract with Nassrya landfill (5)
Figure A-18 Transformers oil spill contingency system
ANNEX IV: MEETINGS AND SITE VISIT

Table A-1 First Meeting at EEHC

<table>
<thead>
<tr>
<th>Entity</th>
<th>EEHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendees</td>
<td></td>
</tr>
<tr>
<td>Eng. Hekmat Abdulrahman Selim</td>
<td>General Director of the Environmental studies Department, Ministry of Electricity and Energy</td>
</tr>
<tr>
<td>Dr. Ismaail El Sawy</td>
<td>Senior Research Engineer at the Environmental Project Management Sector, EEHC</td>
</tr>
<tr>
<td>Dr. Mohamed Fathy Tash</td>
<td>Environmental Assessment Department Manager, Egyptian Natural Gas Co. (GASCO)</td>
</tr>
<tr>
<td>Dr. Amr Abd El Aziz</td>
<td>President, Integral Consult</td>
</tr>
<tr>
<td>Dr. Ahmad Wafiq</td>
<td>Technical Team Lead, Integral Consult</td>
</tr>
<tr>
<td>Date</td>
<td>9/5/2016</td>
</tr>
<tr>
<td>Purpose</td>
<td>Gathering the available data and documents related to the 7 power plants fed by the natural gas pipelines financed by the World Bank (including 6th October Power Plant)</td>
</tr>
<tr>
<td>Summary</td>
<td>(for the points related to 6th of October Power Plant)</td>
</tr>
<tr>
<td>• EEHC clarified that all the power plants including 6th of October Power Plant have already got the environmental approval from the Egyptian Environmental Affairs Agency (EEAA)</td>
<td></td>
</tr>
<tr>
<td>• EEHC will also send to the due diligence consultant the contact details of the focal points inside the electricity production companies to get more specific data about each power plant.</td>
<td></td>
</tr>
</tbody>
</table>

Table A-2 Third Meeting at EEHC

<table>
<thead>
<tr>
<th>Entity</th>
<th>EEHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendees</td>
<td></td>
</tr>
<tr>
<td>Dr. Ismaail El Sawy</td>
<td>Senior Research Engineer at the Environmental Project Management Sector, EEHC</td>
</tr>
<tr>
<td>Eng. Ehab Shaalan</td>
<td>Senior Environmental Specialist, Environment and Natural Resources, World Bank</td>
</tr>
<tr>
<td>Mrs. Amal Faltas</td>
<td>Senior Social Specialist, World Bank</td>
</tr>
<tr>
<td>Dr. Magda Amin</td>
<td>Director General of Environmental Protection Department, Egyptian Natural Gas Co. (GASCO)</td>
</tr>
<tr>
<td>Dr. Azza El-Trabili</td>
<td>Executive General Manager of the Environmental Protection Department, GASCO</td>
</tr>
<tr>
<td>Dr. Mohamed Fathy Tash</td>
<td>Environmental Assessment Department Manager, GASCO</td>
</tr>
<tr>
<td>Eng. Ahmed Galal</td>
<td>Environmental Assessment Department</td>
</tr>
</tbody>
</table>
Environmental and Social Due Diligence for 6th of October Power Plant

Date 29/9/2016

Purpose Knowing the status of the documents requested from EEHC and not received until the submission of the Second Report Drafts

Summary
- The meeting started with a discussion about the importance of the due diligence reports as part of the Natural Gas Funding preparation process and accordingly the importance of obtaining all the required information for the plants’ environmental and social practices.
- EEHC ensured their commitment to supply the required information in order to support the preparation of the reports.
- The Due diligence consultant then went through the list of the required information, with special focus on the Livelihood Resettlement Plan, and changes in ESIA for Beni Suef Power plant, Land Acquisition and Compensation Framework for Burullus as well as the missing land allocation permits and practice proof for other power plants.
- EEHC representative committed to do his best to supply the information he can collect within a week after the meeting.

Table A- 3 Site Visit Conducted at the Plant Site

<table>
<thead>
<tr>
<th>Entity</th>
<th>EEHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendees</td>
<td>Chemist. Philip Nagaty</td>
</tr>
<tr>
<td></td>
<td>CEPC representatives at the Plant</td>
</tr>
<tr>
<td></td>
<td>Eng. Esraa ElMitainy</td>
</tr>
<tr>
<td>Date</td>
<td>18/1/2017</td>
</tr>
<tr>
<td>Purpose</td>
<td>Updating the environmental status of the project after the World Bank Site Visit</td>
</tr>
</tbody>
</table>

Summary
- The visit started with an introduction about the purpose of the visit in relation to the planned 6th of October Natural Gas pipeline.
- The requirements previously sent to the plant through EEHC were reviewed and the documents were provided as available onsite.
- During the site visit the plant management informed the due diligence consultant that the combined cycle unit construction has started in November 2016 after the closure of the EPC + finance contract with the contractor.
- Afterwards, the plant management provided a number of performance documents covering the emergency response plans and environmental performance of the plant including stack emissions, wastewater and waste disposal.
- At the end of the visit, a tour was carried out in the existing site and to the new combined cycle power plant location.