

## ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN SUMMARY - EMERGENCY POWER INFRASTRUCTURE REHABILITATION PROJECT PHASE II

**Project Title:** Emergency Power Infrastructure Rehabilitation Project Phase II  
**Project Number:** P-ZW-FA0-002  
**Country:** Zimbabwe  
**Department:** ONEC **Division:** ONEC.2

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### a) Brief description of the project and key environmental and social components

The Emergency Power Infrastructure Rehabilitation Project Phase II (EPIRP II) is the second energy sector project financed through the African Development Bank administered Zimbabwe Multi-Donor Trust Fund (Zim-Fund). Phase II is being split into two parts and its objective is to improve the availability and reliability of electricity supply through the rehabilitation of generation, transmission and distribution facilities. The project target areas are Kwekwe, Gweru, Bulawayo, Masvingo, Mutare, Harare and Hwange with a combined target population of 4.13 million people. The institution responsible for generation is the Zimbabwe Power Corporation “ZPC” and for transmission it is the Zimbabwe Electricity Transmission and Distribution Company “ZETDC”.

ZETDC is a government owned company under the Ministry of Energy and Power Development whose functions are to develop, operate and maintain the transmission infrastructure of high voltage electricity; to procure bulk electricity from both domestic generating plants and external suppliers in the Southern African Power Pool and to deliver the power to bulk supply points and customers. Hwange Power Station “HPS” is a power generation company operating under Zimbabwe Power Company which is also under the Ministry of Energy and Power Development. The power station is situated in the north western part of Zimbabwe. HPS is the largest coal fired power station in Zimbabwe, with an installed capacity of 920MW. It was commissioned from 1983 to 1987 and it operates as a base load station and meets approximately 40% of the energy needs of the country. Its availability averages about 80% with plant load factor of 65%. The station design largely represents technologies of the late 1960s.

The nature of the project is such that it will yield more environment and social benefits than negative impacts. Most impacts are expected to be site specific and temporary such as dust & noise and will mainly occur during construction. There are two main impacts, one being the management of transformer oil decanted from old transformers which contain polychlorinated biphenyls (PCB’s). In some substations the oil has already been decanted from the unused transformers into tanks for storage, recycling and re-use. Contamination of other oils with PCB’s and spillage hence contamination of the soil are key impacts. As units at HPS become more efficient due to the rehabilitation, the other key environmental impact will be the increased ash production at the power station. The ash dam was designed long before the country’s environmental legislation and has no lining for the protection of ground water and it is also a source of nuisance and health risks for the Ingagula community living downwind of the ash-dam.

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**b) Major environmental and social impacts**

Environmental Aspects	Possible Environmental Impacts
<ul style="list-style-type: none"><li>➤ Moving vehicles and equipment</li><li>➤ Drilling</li><li>➤ Machinery installations</li><li>➤ Decommissioning of old equipment</li><li>➤ Excavations</li><li>➤ Oil spillages during handling such as transfer of oil between containers and the transformers</li><li>➤ Storage and transportation of decommissioned PCB contaminated transformers</li><li>➤ Disposal of old cables</li></ul>	<ul style="list-style-type: none"><li>➤ Dust, fumes and smoke pollution</li><li>➤ Oil and chemical spillages</li><li>➤ Noise to the surrounding community and workers</li><li>➤ Heat from welding works</li><li>➤ Injuries to employees</li><li>➤ Soil erosion after soil loosening</li><li>➤ Surface pollution with metal scrap and other waste materials</li><li>➤ Siltation of natural drainage systems as a result of the washing of soil from the site</li><li>➤ Contamination of soil and water resources</li><li>➤ Loss of aesthetic value due to disposal of old cables and other waste</li></ul>

**b.1 Impacts on the Local Communities**

The project is largely expected to have positive impacts on the local community as it is aimed at reducing downstream effects of effluent, dust, augment ash dam stability and improve worker safety at Hwange Power Station. Thus besides challenges during execution of the project, the end results are fully beneficial. For safety reasons, all ZETDC substations are located far away from settlements to reduce the risks associated with staying too close to such installations. At the same time, the substations are security installations which are not accessible to the general public. It is therefore highly unlikely that the general public will be negatively affected by the implementation of the project. As a matter of policy, ZETDC encourages contractors to employ the local community for non-technical work required as part of project implementation. Local people will therefore be employed for such activities at all the sites where rehabilitation work will be undertaken.

**b.2 Positive impacts**

- Reduced dust levels to the Ingagula community and improved employee health and morale
- Reduced injuries associated with fugitive dust to employees
- Highly stable ash dams thereby protecting the station and the Ingagula community from possible dam failure
- Enhanced plant insurability after the installation of the vacuum plant through reduction of coal dust on structures
- More workers will be employed to execute the project, thus creating employment for the locals
- Increased business opportunities for the local business people as more people will have disposable income

### **b.3 Negative Impacts**

Excavations associated with the rehabilitation work entail the generation of dust. By nature, dust is fugitive and tends to affect communities far from the sites where it would have been generated. Increased dust will affect people living in the vicinity of the power station but in the case of substation rehabilitation there would be no homesteads which will be affected by the commencement of construction works. Excavations will loosen soil and expose it to erosion. Eroded soil from the site could cause siltation of stream and rivers in the area. Biophysical impacts will emanate from disposal of decommissioned materials which might not be recyclable. The required gravel to rehabilitate the road near Ingagula to the HPS will result in some minimum impacts because it will be sourced from designated Ministry of Transport sites with no new or serious environmental degradation caused.

Disposal of old cables and other waste materials will affect the aesthetics aspects of the area and will constitute litter on site. Faulted transformers to be removed from the system will be stored on temporary storage sites at each of the substations. Plans are underway to construct suitable sites for their storage in line with the requirements of the Stockholm Convention. Before construction of these sites is complete, the transformers will be kept at the substations. Spillage of oil may occur during the process of filling the new transformers with oil or the use of mobile equipment; this will immediately pollute soil in the affected area and in the long term cause ground water pollution as oil seeps through the soil.

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#### **c) Enhancement and mitigation program**

Dust suppression through water sprinkling will be instituted to minimize on fugitive dust. All employees working on site including existing employees will be provided with appropriated dust masks during work. It is also important to note that one of the projects' objectives is to address dust generation at Hwange Power station. The impact of dust is likely to be insignificant for substation work since there are no communities living within a radius of 1km from the substations. Generally substations are located away from settlements for safety reasons. However, where necessary and for the health of workers, sites to be excavated will be sprinkled with water first before excavations are undertaken. The nature of the landscape at Hwange Power Station is generally very flat such that washing away of soil from the site will be very minimal. Despite that all contractors will be monitored and expected to manage all works in an environmental friendly manner including ensuring that all excavated soil is backfilled before moving off the site.

All waste generated during the rehabilitation of substations will be transported to neighbouring approved landfill sites. Likely pollution by the transformer oil will be managed through ensuring that the contractor prevents oil spills. However, in the event that accidental spillages occur, soil over the affected sites will be scooped and put into polythene bags with minimum thickness of 100 microns. These bags would then be stored in the same area where decommissioned transformers are stored while awaiting rehabilitation. All decommissioned non-hazardous materials will be handed over to the Salvage Committees in the Hwange area.

#### d) Monitoring program and complementary initiatives

The table below highlights some of the activities that will be carried out as a way of managing environment and social impacts of the project:

Issue	Monitored Parameters	Locality	Monitoring Methodology	Monitoring Frequency	Responsibility
Soil Erosion	Soil loss from the construction sites	Construction area, stockpiles	Visual	Weekly during the construction phase	ZETDC, Contractor
Air Quality/dust	Suspended dust particulate matter	Construction sites	Visual	During dry and windy period over the construction period	ZETDC, Contractor
Occupational health and safety	Safety equipment provided and being used by workers  Safety and warning signs posted all around the construction site  Cleanliness of working areas and waste accumulation	In areas where workers are assigned to work  Within the site	Visual	Before any physical work activities start  Weekly, more frequently if violations observed	ZETDC, Contractor
Employment	Number of locals employed	Recruitment office	Employment records	Monthly	ZETDC, Contractor
Safety of the community during construction	Restricted access into substations	Communities living around the project sites	Safety record sheets	Continuous during the construction phase	ZETDC, contractor
Transformer oil management	Signs of spillages and tool box talks with involved workers	Around the project sites specifically in the vicinity of old transformers.	Visual assessment of spillages during the once-off emptying of transformers	Continuous during the construction (specifically transformer replacement stage)	ZETDC, contractor
Disposal of old cables	Manner in which old cables are disposed	Disposal sites	Visual assessments	Monthly	ZETDC, contractor

Issue	Parameters	Recognizable Evidence	Monitoring Frequency	Responsibility
Induction	All new employees during the execution of the project will be inducted in order for them to understand the impacts of every activity to be carried out.	Induction Certificate and routine audits	Monthly	ZPC Contractors
Ambient air quality	Suppression of fugitive dust	Visual	Daily	Contractors
Occupational health and safety	Provision and use of PPE  Safety Signage  Housekeeping  Permit to work system	Visual    Permit Book	Always during working time  Daily	ZPC Contractors
Employment	Competence for specialized activities	Employment files Licences	Monthly	ZPC Contractors
Community Safety	Restricted access into working zones	Restrictions and security control	Daily	ZPC
Oil Spillages	Designated oil areas and decanting bays	Visual	Daily	ZPC Contractors
Disposal of decommissioned equipment	Disposal areas and methods	Visual assessments  Safe disposal certificates or slips	Monthly	ZPC Contractors

**e) Institutional arrangements and capacity building requirements**

The cross-cutting issues in the project will be addressed by supporting the existing structures rather than developing new interventions. The project will build local skills through the capacity building component and create jobs during and post implementation of the project. Implementation of the Project will generate critical knowledge that will be useful for continuous improvement of the power sector system rehabilitation program in the country. Information on implementation progress will be documented in quarterly progress reports, annual audit reports, completion reports, and independent evaluation notes.

At Hwange Power Station there is an Environmental Committee which deals with all issues to do with environment comprising of the following:

- |                                     |          |
|-------------------------------------|----------|
| ➤ Section Engineer Risk and Quality | Chairman |
| ➤ Station Chemist                   | Member   |

➤ Civil Engineer	Member
➤ Chief Risk Officer	Member

At ZETDC there is an Environmental Health officer who is a trained Environmental Scientist and at Hwange the Chief Risk Officer is a trained Environmental Engineer and both have teams of environment and social specialist including the nurse at Hwange who will ensure implementation of the ESMP.

#### **f) Public consultations and disclosure requirements**

Legislation and regulatory requirements which guide environmental management and implementation of projects in Zimbabwe is the Environmental Management Act (Chapter 20:27). The First Schedule of the Act has a list of projects for which EIA studies are required before implementation (Prescribed Activities). Under the heading Power Generation and Transmission, the list includes thermal power stations, hydropower stations and high voltage transmission lines as power sector projects for which EIA studies must be undertaken prior to implementation. The legal framework does not provide for rehabilitation projects. However, all the work will be done in consultation with EMA, Ministry of Transport for the roads, District Administrator's office and all other stakeholders including employees affected by the activities. In relation to health and safety, all will be done in line with Factories and Works Act Chapter 14:08 together with Statutory Instrument 68 of 1990. Any other relevant statutes will be observed. Communities that will be affected in terms of access nuisance and any other disruptions will also be consulted and kept informed.

#### **g) Estimated costs**

##### **g.1 Monitoring Budget**

For ZETDC, monitoring will be undertaken at each site on a quarterly basis. The main cost items are mileage, water samples, solid waste disposal, personal protective equipment (PPE) and subsistence allowances.

<b>Mileage</b>	2,106.00/Quarter
<b>Water samples</b>	3,750.00/Quarter
<b>PPE</b>	755.00 /year
<b>Solid waste disposal costs</b>	\$350/per ton.

For ZPC the costs over a two year period are estimated as follows:

<b>PPE @ \$60 per employee</b>	24,000.00
<b>Water samples per half year</b>	8,000.00/quarter
<b>New Effluent Plant Water Samples</b>	4,800.00/quarter
<b>Waste disposal</b>	7,000.00
<b>Accommodation and related costs</b>	20,000.00
<b>Emergence Services</b>	4,000.00
<b>Injury Costs</b>	8,000.00
<b>Miscellaneous</b>	2,000.00

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**h) Implementation schedule and reporting**

Activities	2014				2015				2016			
	Quarter				Quarter				Quarter			
	1	2	3	4	1	2	3	4	1	2	3	4
Community consultations on final program for construction												
Re activating all the Committees established												
Compilation of a detailed ESMP by the contractor												
Grievance & complaints redress												
Monitoring and Evaluation												
Preparation of ESMP compliance report by ZPC and ZETDC and submission to AfDB												

**i) Conclusion**

The proposed rehabilitation work is not expected to have major and irreversible negative impacts on the social and biophysical environments. All the impacts are of a temporary nature and largely confined to the project sites. At all the substations where work will be undertaken, there are no homesteads that are within a radius of 1km from the substations hence impacts on the local community will equally be negligible. ZETDC has successfully undertaken similar work at some of its substations in the past and was able to effectively manage the associated impacts. The rehabilitation work will be closely monitored to ensure that all negative impacts are avoided or minimized while the positive ones are enhanced. At HPS, no new environment and social management threats are anticipated. The project is going to improve the currently malfunctioning equipment which is as old as the station and replace with current machinery in line with technological advancements. No adverse impacts on environment are therefore expected during execution and after execution of the projects. As a company certified to Quality management Systems and working towards certification to ISO 14001:2004 Environmental management Systems, all project works will be monitored accordingly in line with such systems requirements.

**h) Contacts**

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