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A Mini Ratna Company

TENDER DOCUMENT

FOR
DESIGN, SUPPLY, ERECTION, COMMISSIONING
AND TESTING
OF
GRID CONNECTED 4.0 MW SOLAR POWER PLANT
HAVING FIVE YEARS O&M
FOR
CENTRAL COALFIELDS LIMITED, RANCHI

AT
GIRIDIH AREA

VOLUME – II

[TECHNICAL]

JANUARY, 2023

Central Mine Planning and Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)
Gondwana Place, Kanke Road,
Ranchi - 834031 (Jharkhand)

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PROJECT SUMMARISED DATA

Sl. No.	Particulars	Description
Ground Mounted Solar Power Plant- 4.0 MW (AC) Mono Crystalline		
1.	Owner of Project / Land	Central Coalfields Limited
2.	Location	Near Truck Parking, Giridih Area, CCL
3.	Latitude-Longitude	24.166^0 N – 86.291^0 E
4.	Total Land Area Available (approx.)	8.15 Hectare
5.	Plant Capacity (AC)	4.0 MW
6.	Nominal/system Power (DC) (Minimum)	5.2 MWp
7.	PV Module (Min.)	535 Wp, Mono-PERC
8.	No. of modules	As per requirement
9.	Inverter	1000 kW-4 nos.
10.	CUF-AC	22.61 %
11.	Performance Ratio (PR)	80%
12.	Plant Life	25 Years
13.	Operation & Maintenance of Plant	5 Years
14.	Wind Speed	44 - 47 m/s
15.	Seismic Zone	Zone – III
16.	Average Annual Precipitation	49.1 mm
17.	Power Feeding Substation / Voltage	3x3MVA, Giridih Project Substation at 33kV Voltage Level
18.	Project Distance from Substation	1.5 KM (Approx.)
19.	Nearest Highway	NH-114A
20.	Nearest Railway Station	Giridih Railway Station
21.	Nearest Domestic Airport	Deoghar Airport

CHAPTER-I

INTRODUCTION

1.1 GENERAL

Central Coal Limited (CCL) has a number of projects which are spread in the state of Jharkhand. Geological Coal Reserves in CCL command area are up to 300m & above depth. For administrative purpose there are seven operating coalfields in the command area of CCL. The company operates around 62 coal projects which include underground and opencast mine. Out of 62 operative mines around 40 mines are opencast mine and remaining UG mines. Additionally, 7 coal washeries, (5 Coking Coal and 2 Non-Coking Coal washeries) are running under administrative control of CCL.

To supply power to various projects and other power consuming centers of the project, a number of substations have been installed. Most of these substations receive power from DVC. Total contract demand of CCL is around 152MVA.

1.2 Grid connected solar power plant

A solar photovoltaic (PV) system is a renewable energy power generation technology that uses photovoltaic modules to generate electricity directly from solar radiation, using a phenomenon called the photovoltaic effect. The electricity generated can be stored, used directly, or fed back into grid. Solar PV is a reliable and clean source of electricity that can suit a wide range of power generation applications for residential, industrial, agricultural, etc. consumers. Some common applications include solar generation for captive consumption, power sale and savings in electricity costs.

A grid-connected solar power plant refers to a solar PV system that is connected to the local distribution grid. It is a form of distributed power generation. This system includes different components that are selected depending on the system type, site location and application. Generally, components of this system comprise PV modules, mounting structures, inverter, transformers and miscellaneous items like meters, junction box, cables, etc.

A grid-connected solar PV system has following main features:

- Electricity generation during daytime
- Low maintenance requirement
- Simple installation
- Easy scalability
- Robustness
- Low investment compared to stand alone system with battery backup.