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for the Global Goals

TEMPLATE

MONITORING REPORT

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VERSION **v. 1.1**

RELATED SUPPORT - **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

Key Project Information

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Key Project Information

GS ID (s) of Project (s)	GS 7137
Title of the project (s) covered by monitoring report	50 MW Mahoba Solar PV Power Project by M/s Prayatna Developers Pvt. Ltd. at Mahoba, UP
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	05
Version number of the monitoring report	04
Completion date of the monitoring report	31/07/2025
Date of project design certification	16/11/2020
Date of Last Annual Report	30/12/2024
Monitoring period number	02
Duration of this monitoring period	01/01/2021 to 15/11/2023 (Both Date included)
Project Representative	Prayatna Developers Pvt. Ltd.
Host Country	India
Activity Requirements applied	☐ Community Services Activities ☒ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	ACM0002: Grid-connected electricity generation from renewable sources - Version 20.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
7 Affordable and Clean Energy	MWh of renewable energy generated	289,877	MWh
8 Decent Work and Economic Growth	Trainings	06	No. of Training
	Employees	12 ¹	No. of Employees
	Income (INR)	48,85,333.44	INR
13 Climate Action (mandatory)	Emission Reduction	273,034	tCO ₂ (GSVERs)

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	SDG 13: Climate Action VERs	SDG 8: Decent Work and Economic Growth	SDG 7: Affordable and Clean Energy
01/01/2021	31/12/2021	96,559	02 No. of Training 12 of Employees Unskilled – 2 Semi-skilled -1	102,515

¹ The total wage for 12 employees has been calculated as ₹48,85,333.44 for the period 2021 to 2023. As per the wage structure for year 2023 Unskilled Workers – 388 INR per day or 10,088 INR per month, Semi-skilled Workers - INR 427 per day or 11,102 INR per month, Skilled Workers – 478 INR per day or 12,428 INR per month.

			Skilled - 9	
01/01/2022	31/12/2022	96,334	02 No. of Training 12 of Employees Employees Unskilled – 2 Semi-skilled -1 Skilled - 9	102,277
01/01/2023	15/11/2023	80,141	02 No. of Training 12 of Employees Employees Unskilled – 2 Semi-skilled -1 Skilled - 9	85,085

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The main purpose of the project activity is to generate electrical energy through sustainable means using solar power resources, the generated green electricity contributed to climate change mitigation efforts. This project activity is a large-scale solar project. Prayatna Developers Pvt. Ltd. is the project investor for this project activity.

The project activity involves installation of 05 projects of 10 MW_{AC} each, totaling to 50MW_{AC} solar power project under Jawaharlal Nehru National Solar Mission (JNNSM) Phase-II, Batch-II, Tranche – I, State Specific Bundling Scheme (under Open Category). The projects are installed in the same project boundary at Village: Akathauha & Ghutbai, in Tehsil:Charkhari, District:Mahoba, State:Uttar Pradesh.

The electricity generated from project activity sold under the Power Purchase Agreement (PPA), signed with NTPC Ltd. NTPC has been identified by the Government of India (GoI) as the Implementation Agency for setting up of Grid-connected Solar PV Power Projects under State Specific Bundling Scheme under the National Solar Mission of Government of India (GoI). And NTPC Vidyut Vyapar Nigam Limited (NVVN) on behalf of NTPC is purchase Solar Power from Solar Power Developer, and sell it to Discoms. The electricity generated from the project activity evacuated through 132 kV sub-station located at Mahoba for consumption in the Indian Electricity Grid.

The project replaced anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 94,209 tCO₂e per annum, thereon displacing 100,020 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/ fossil fuel-based power plant. The project activity is the installation of a new grid-connected renewable power plant/unit and this is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs. The land for the project activity was private land and is

purchased in the name of Prayatna Developers Pvt. Ltd. The details of the project are mentioned in the table:

Capacity in MW	50
Start Date	15/10/2016
Local Stakeholder Consultation as per CDM	21/09/2016
Commissioning Date	07/06/2017
PPA	18/05/2016
SFR Date	27/05/2019
Project registered under CDM	27/08/2020
State	Mahoba, Uttar Pradesh
Grid	NTPC Ltd.
Types of Solar PV Modules	Poly-crystalline

Project Boundary

The project activity includes 50 MW installed capacity and is greenfield large solar power plants. The installation of 05 projects of 10 MWAC each, totaling to 50 MWAC solar power project under Jawaharlal Nehru National Solar Mission (JNNSM) Phase-II, Batch-II, Tranche – I, State Specific Bundling Scheme (under Open Category). The projects are installed in the same project boundary at Village: Akathauha & Ghutbai, in Tehsil: Charkhari, District: Mahoba, State: Uttar Pradesh. Hence the project boundary includes the solar project activity, substation, grid and all power plants connected to the grid. The project activity evacuates power to the Indian grid

Scenario existing prior to the implementation of the project activity:

As the project activity is the installation of a new grid-connected renewable power plant/unit. The scenario existing prior to the implementation of project activity is

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool 7: Tool to calculate the emission factor for an electricity system” (Version 7.0)².

Baseline Scenario

Baseline scenario and Scenario existing prior to the implementation of the project activity are both same.

Sustainable Development

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment, Forest and Climate Change (MoEFCC), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM)³ projects from India. However, PD confirms that project activity did not claim or will not claim both CERs and VERs for same monitoring period. The project’s contribution towards sustainable development has been addressed based on the following sustainable development aspects, in line with the requirements of the NCDMA:

- **Social well being**

The project activity provides job opportunity to local people during erection, commissioning and maintenance of the solar project. Frequency of visiting to villages and nearby areas by skilled, technical and industrialist has increased due to installation /site visit/operation and maintenance work related to solar plant. This directly and indirectly positively effects the economy of villages and nearby area.

- **Environmental well being**

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

³ <https://cdm.unfccc.int/Projects/DB/Appendix1597925806.04/view>

Solar power is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible. Thus, the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

- **Economic well being**

The project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and life style of the area.

- **Technological wellbeing**

The project activity is step forward in harnessing the untapped solar potential and further diffusion of the solar technology in the region. The project activity leads to the promotion and demonstrates the success of solar projects in the region which further motivate more investors to invest in solar power projects. Hence, the project activity leads to technological well-being.

A.2. Location of project

The Project is located at Akathauha village of Mahoba district, in the Indian state of Uttar Pradesh. The site is well connected by state highway state highway NH-76 to Mahoba. The nearest commercial city remains Jhansi, which is approximately 151 km from the Project site location. Nearest major airport to the site remains Jhansi, 151 km away; while the nearest railway station is at Mahoba, 40km away from the site. The project coordinates are 25°27'32"N, 79°42'47"E.

Project: Prayatna Developers Pvt. Ltd

Latitude: 25°27'32"N

Longitude: 79°42'47"E

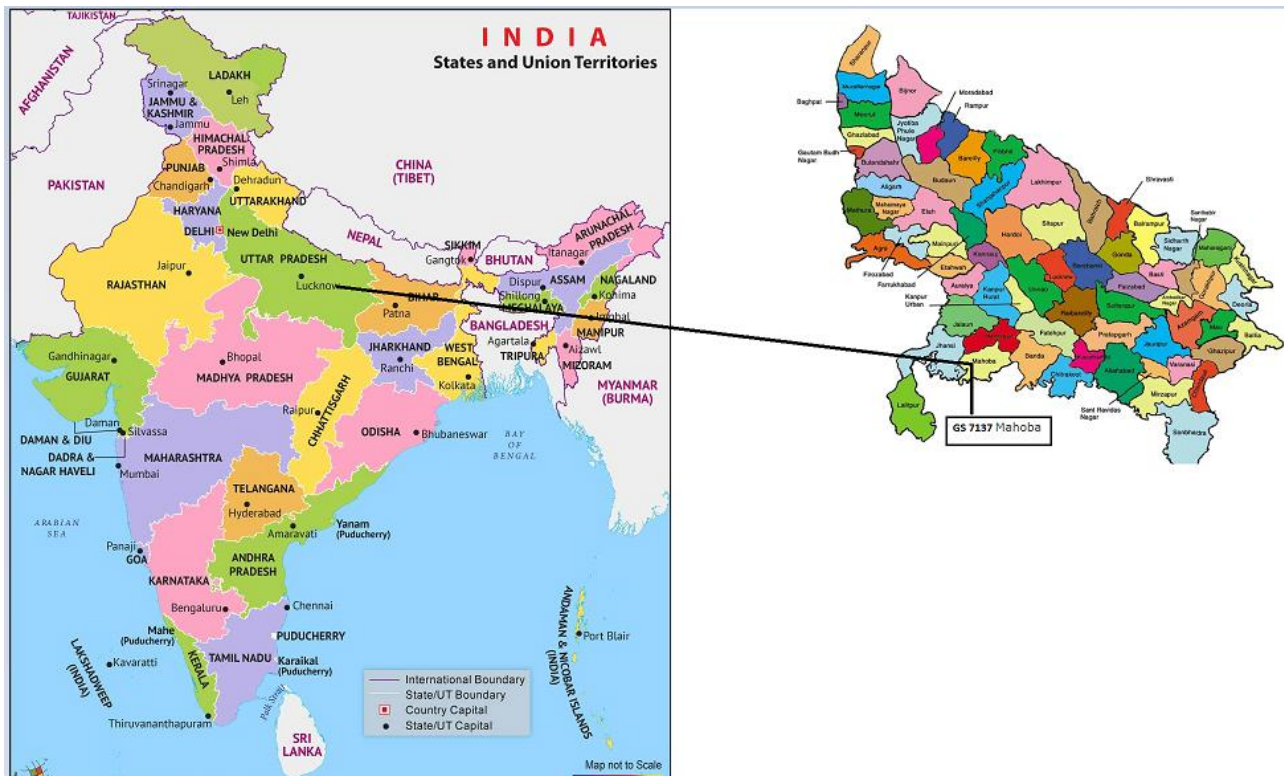
Village: Akathauha

District: Mahoba

State: Uttar Pradesh

Country: India

Project Developer	Capacity in MW _{AC}	Latitude	Longitude	Commissioning date
Prayatna Developers Pvt. Ltd	50MW	25°27'32"N	79°42'47"E	07/06/2017





A.3. Reference of applied methodology

Title: Grid connected renewable electricity generation.

References: Approved Large Scale Consolidated Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 20, EB 105)

<https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

ACM0002 draws upon the following tools which have been used in the PDD:

- Methodological Tool 7: Tool to calculate the emission factor for an electricity system - Version 07.0
- Methodological Tool 1: Tool for the demonstration and assessment of additionality - Version 07.0.0, EB 70 Annex 8⁴

A.4. Crediting period of project

Type	Renewable
CDM crediting period	27/08/2020 to 26/08/2027 ⁵

⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

⁵ <https://cdm.unfccc.int/Projects/DB/Appendix1597925806.04/view>

GS design certification date	16/11/2020
Transition from GSCER to GSVER	23/03/2022
GS crediting period	16/11/2018 ⁶ to 15/11/2023
Length of Crediting period	7 years Which will be renewed twice totaling to 15 years (7+5+3)
Current Monitoring Period	01/01/2021 to 15/11/2023(Both Date included)

This is to declare that “the project developer will not issue both a CER and a Gold Standard VER for the same vintage from a project that is registered with GoldStandard.”

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project activity aims to harness solar energy through installation of PV with total installed capacity of 50 MW_{AC}. The solar PV power plant have solar PV modules, inverters, transformers and other protection system and supporting components.

The solar PV power plant have solar PV modules, inverters, transformers and other protection system and supporting components. The solar PV modules have a useful life of 25 years.

A. Solar PV modules:

Module Supplier	Module Model	Capacity (p)	Number	Total Capacity (MWp)
Jinko	Poly C-Si	315	145178	45.73
Jinko	Poly C-Si	320	61576	19.70
Adani	Poly C-Si	325	5688	1.85
Adani	Poly C-Si	320	6688	2.14

⁶ 10.2.1 of GHG Emissions Reduction & Sequestration Product Requirements v.2.1 “The start date of Crediting Period is the date of start of operation (start of planting for A/R Projects) or a maximum of two years (three years for A/R & AGR) prior to the date of Project Design Certification, whichever occurs later.”

Adani	Poly C-Si	315	704	0.22
		Total Capacity in MWp		69.65

B. Invertor

S.No.	Make	
1.	Manufacturer	Huawei
2	Model	SUN2000-43KTL
3	Rated Capacity	43 KW, 52.5 KVA
4	No. of Inverters	1163
5	Rated Input Voltage (Max. InputVoltage)	500 V

C. Transformer

S.No.	Make	
1	Manufacturer	T&R
2	Capacity	5MVA
3	No. of Transformers	10
4	Voltage Ratio	.500/33 KV

D. Metering Equipment Details

S.No.	Make	Sub-Station	Solar Plant End
1	Manufacturer	Secure Make	L&T Make
2	Type	ABT meters	ABT meters
3	Accuracy Level	0.2s	0.2s
4	Total no of meter	2	5*2 = 10

Relevant dates for the project activity:

07/06/2017 is the date of commissioning of the project activity. The project is commissioned on 07/06/2017 and supplying generated electricity to INDIAN grid. There were no major breakdowns occurred in the current monitoring period. Although, no such events have happened during the reported monitoring period, which can alter the applicability of the applied methodology.

B.1.1 Forward Action Requests

No FAR raised

B.2. Post-Design Certification changes

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

Not Applicable

B.2.2. Corrections

In the registered PDD, the geocoordinates were mentioned incorrect. The project location coordinates have been corrected during current monitoring period 01/01/2021 to 15/11/2023 (Both Date included). The latitude and longitude values provided under Section A.2 have been revised to accurately represent the actual location of the project site.

B.2.3. Changes to start date of crediting period

Not Applicable

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

Not Applicable

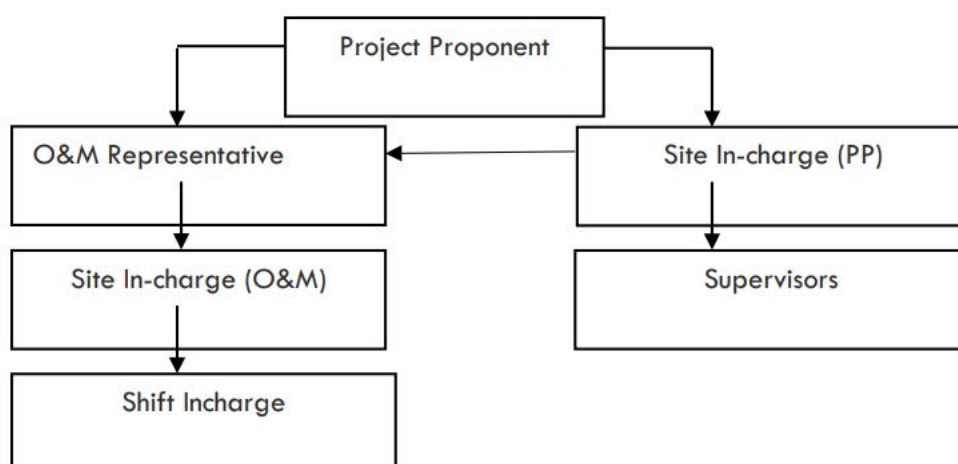
B.2.5. Changes to project design of approved project

Not Applicable

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The monitoring plan is developed in accordance with the modalities and procedures for project activities and is proposed for grid-connected solar power project/ unit being implemented in Uttar Pradesh, India. The monitoring plan, implemented by the project developer describes about the monitoring organization, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for monitoring, measurement, reporting and reviewing of the data rests with the project participant.



Responsibilities of Site In charge (PD): Overall functioning and maintenance of the project activity, the Site in-charge is coordinate with the O&M operator as well as the site supervisors. The site in-charge is responsible for collecting metering data to maintain electricity generation records, managing employee salaries, and maintaining related records for SDG 8. Additionally, he/she is accountable for addressing any grievances raised by stakeholders or employees and for assigning appropriate personnel to resolve them.

Responsibilities of O&M Representative: Co-ordination between Site in charge of the O&M operator as well as the project participant and further report to PD head office.

Responsibilities of Site In-charge (O&M Operator): Responsibility for maintaining the data records, ensures completeness of data, and reliability of data (calibration of equipment) as well as data recording for all the parameters.

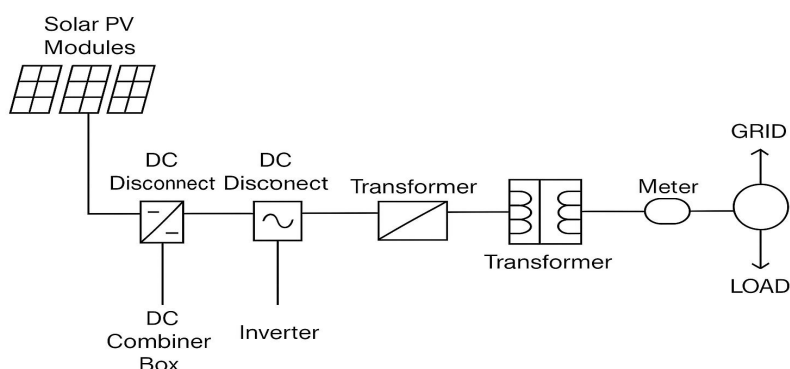
Responsibilities of Shift In-charge: Responsibility for day-to-day data collection and maintains day to day monitored data.

Data Measurement

The export and import energy are measured continuously using above mentioned Main & Check meters. Export & Import readings of Main & Check meters are taken on monthly basis by authorized officer of UPPTCL, Jhansi in the presence of PD or representative of PD. The meter reading is taken jointly and signed by the representatives of the UPPTCL and project investors. Based on the readings, invoices are raised by project investors. These invoices can be used for cross checking the meter readings taken for the project activity. It is to be noted though PD or PD representative is available during meter reading, the calculations of net electricity supplied to grid is completely under purview of UPPTCL officer and PD do not have any control on it. Also, accuracy class of meters and calibration frequency is under purview of UPPTCL officer and PD do not have any control on it. PD got the monthly credit report from where net electricity supplied to grid is obtained and used for emission reduction calculations.

It is to be noted that though the PD or their representatives are available during meter reading, the calculations of net electricity supplied to grid is completely under purview of UPPTCL and PD does not have any control on it. Also, accuracy class of meters and calibration frequency is under purview of UPPTCL, Jhansi and PD does not

have any control on it. PD gets the monthly credit report from where net electricity supplied to grid is obtained and used for emission reduction calculations.



Data collection and archiving

Export & Import readings from the meters are collected under the supervision of the authorized representatives of PD. The net electricity supplied to grid is calculated based

on export & import readings. Export and Import data recorded and stored in electronic &/or Paper format. The records are checked periodically by the Head (Operations) and discussed thoroughly with the O&M Team. The period of storage of the monitored data is 2 years after the end of crediting period or till the last issuance of GS CERs for the project activity whichever occurs later.

Mismatch in Monitoring Period and the Billing Period

In case the dates of a particular monitoring period do not match with the dates of the billing period, the net electricity exported to the grid is calculated from:

$$D = (A/B) * C$$

Where,

A = Difference of number of days which are not matching of billing period and monitoring period.

B = Total Number of days of the billing period/ month

C = Net Electricity supplied to the grid for that given billing period/ month.

The calculated value after apportioning is used for calculation of emission reductions during that period.

The current monitoring period spans from 01/01/2021 to 15/11/2023 (both dated included). Therefore, following the above-mentioned apportioning procedure:

A	Difference of number of days which are not matching for November	15
B	Number of days of November	30
C	Net Electricity supplied to the grid for November as per JMR	6,536

the net electricity exported to the grid is calculated from: $D = (A/B) * C$
 $= (15/30) * 6,536$
 $= 3,268 \text{ MWh}$

Emergency preparedness

The project activity does not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

In the unlikely event of failure of all Main, Check as well as Standby meter installed at Substation, where all the faulty meters are required to be repaired or replaced simultaneously, the export & import readings from Main, Check & Standby Meters installed at the inter-connection point at the project site is used for monitoring of net electricity exported to the grid.

Personnel training

In order to ensure a proper functioning of the project activity and a proper monitoring of emission reductions, the staffs have been trained. The plant helpers are also trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

Meter details

Projects activity comprises of installation of 12 Energy meters (5 main meter and 5 check meters for each 10 MW) at project site (33 KV PDPL Substation) and 2 Energy meters. (1 main meter, 1 check meter) for joint metering at substation interconnection point (132 KV PDPL Substation).

Meter & Calibration Details:		
Details	MainMeter	CheckMeter
132KV PDPL SUBSTATION		
Meters S.No.	17051284	17051285
33 KV PDPL SUBSTATION - CHARKHARI		
Meters S.No.	17051287	17051286
	17051292	17051288
	17051294	17051290
	17051295	17051293
	17051296	17051298
Type	ABT meters	ABT meters
Manufacturer	L&T Make	L&T Make
Accuracy	0.2s	0.2s
Last Calibration	30/03/2017	30/03/2017
Due Date	30/03/2022	30/03/2022
New Calibration	05/03/2022	05/03/2022
Calibration frequency	Once in 5 years as per CEA guidelines	

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Relevant SDG Indicator 13: Take urgent action to combat climate change and its impacts

Data/parameter	EF _{grid,OM,y}
Unit	tCO ₂ e/MWh
Description	Operating Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 15, December 2019 ⁷
Value(s) applied	0.9622
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system," as 3-year generation weighted average using data for the years 2016-17, 2017-18 & 2018-19. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	EF _{grid,BM,y}
Unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 15, Dec 2019
Value(s) applied	0.8811
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.

⁷ https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver15.pdf

Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	$EF_{grid,CM, y}$
Unit	tCO ₂ e/MWh
Description	Combined Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 15, Dec 2019
Value(s) applied	0.9419
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	-

D.2 Data and parameters monitored

Relevant SDG Indicator 7.2.1: Renewable energy share in the total final energy consumption

Relevant Indicator	SDG	SDG 7.2.1: Affordable and Clean Energy
Data / Parameter		$EG_{PJ,y}$
Unit		MWh
Description		Quantity of net electricity supplied to the grid
Source of data		Generation statement provided by UPPTCL Jhansi every month.
Value(s) monitored		289,877 MWh
Measurement methods and		Data Type: Measured Monitoring equipment: Energy Meters

procedures

of accuracy class 0.2s Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually.

Archiving Policy: Paper &/or Electronic Calibration frequency: Once in 5 years as per CEA guidelines

Electricity exported/imported to the grid is in kWh. However, for the calculation purpose electricity exported is converted in MWh. The Net electricity supplied to the grid by the project activity is calculated as a difference of electricity exported to the grid, electricity imported from the grid obtained from Monthly Meter reading reports provided by UPPTCL Jhansi as per below equation:

As per the metering arrangement, the main billing meter used for invoicing and energy accounting is installed at the 132 kV PDPL Substation. The relevant meter serial number is 17051284.

$$EG_{PJ,y} = EG_{Export} - EG_{Import}$$

Projects activity comprises of installation of 12 Energy meters (5 main meter and 5 check meters for each 10 MW) at project site (33 KV PDPL Substation) and 2 Energy meters. (1 main meter, 1 check meter) for joint metering at substation interconnection point (132 KV PDPL Substation).

Meter & Calibration Details:		
Details	MainMeter	CheckMeter
132KV PDPL SUBSTATION		

	Meters S.No.	17051284	17051285
	33 KV PDPL SUBSTATION - CHARKHARI		
	Meters S.No.	17051287	17051286
		17051292	17051288
		17051294	17051290
		17051295	17051293
		17051296	17051298
	Type	ABT meters	ABT meters
	Manufacturer	L&T Make	L&T Make
	Accuracy	0.2s	0.2s
	Last Calibration	30/03/2017	30/03/2017
	Due Date	30/03/2022	30/03/2022
	New Date Calibration	05/03/2022	05/03/2022
Due Date	04/03/2027	04/03/2027	
Calibration frequency	Once in 5 years as per CEA guidelines		
Monitoring frequency	Monthly		
QA/QC procedures	Calibration of all the meters will be undertaken once every five year and faulty meters will be duly replaced immediately. The meters are of accuracy class 0.2s. Cross Checking: Quantity of net electricity supplied to the grid and it is cross checked from the Invoices/ Monthly Bill raised by theProject Developer to NTPC Limited.		

Purpose of data	The Data/Parameter is required to calculate the baseline emission
Additional comment	Data archived electronically for a period of 2 years beyond the end of crediting period.

Relevant SDG Indicator 8.5: Average hourly earnings of employees, by sex, age, occupation and persons with disabilities

Relevant Indicator	SDG 8.5.1: Decent Work and Economic Growth
Data / Parameter	Quality of employment
Unit	Number (Trainings) INR (salary)
Description	06 Number of Trainings provided to employees & O&M staff Salary given to the employees of the project. As per minimum wages notification, 2023 by Department of Labour Uttar Pradesh dated 03/04/2023⁸, the workers in Rajasthan under schedule – I, s. no. 24 are required As per the wage structure 2023 Unskilled Workers – 388 INR per day or 10088 INR per month, Semi-skilled Workers - INR 427 per day or 11102 INR per month, Skilled Workers – 478 INR per day or 12428 INR per month⁹.
Source of data	Training Records Salary Slip of the project employees.
Value(s) monitored	Some of the trainings & workshops that are given to the respective O&M staffs by PD. As per the records, 06 trainings are conducted. Since the

⁸ [Minimum Wages in Uttar Pradesh Revised April 2023 » HR | Compliance | Labour Law](#)

⁹ The total wage for 12 employees has been calculated as ₹48,85,333.44 for the period 2021 to 2023. As per the wage structure for year 2023 Unskilled Workers – 388 INR per day or 10088 INR per month, Semi-skilled Workers - INR 427 per day or 11102 INR per month, Skilled Workers – 478 INR per day or 12428 INR per month.

	total number of trainings each year is 2. The training programme helps in making the workforce efficient and skilled at their job. This not only helps the company but also adds to growth of individual employees. Thus, the project has a positive impact on the parameter. The parameter has a positive impact as the project results in direct employment and income generation.
Measurement methods and procedures	• Training Attendance sheets and records. • Employment Records • Salary slips of the employees
Monitoring frequency	Annually
QA/QC procedures	Salary slip can be checked for earnings of female and male employees. The trainings held can be cross checked with the training documents maintained at site.
Purpose of data	Continuation of regular trainings/workshops for employees & O&M staffs
Additional comment	-

Relevant SDG Indicator 8.5: Average hourly earnings of employees, by sex, age, occupation and persons with disabilities

Relevant SDG Indicator	SDG 8.5.1: Decent Work and Economic Growth
Data / Parameter	Quantitative employment
Unit	Number of O&M staffs involved in the project
Description	Total employment generated due to the implementation of project activity
Source of data	Plant employment records
Value(s) applied	The total number of O&M staffs employed for the operation & maintenance of the project activity are around 12

		Unskilled	2	
		Sem – skilled	1	
		Skilled	9	
Measurement methods and procedures	Employment Records			
Monitoring frequency	Annually			
QA/QC procedures	The number of persons employed are mentioned in the plant register, which can be crossed checked with daily attendance register.			
Purpose of data	To monitor the contribution to SDG 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all)			
Additional comment	-			

Relevant SDG Indicator 13: Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change.

Relevant SDG Indicator	SDG13.2.1: Climate Action
Data / Parameter	Air quality
Unit	tCO ₂ e
Description	Reduction in CO ₂ emission reduction due to implementation of project activity

Source of data	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) monitored	273,034 tCO ₂ e
Measurement methods and procedures	Calculated from CEA database and Energy Generation
Monitoring frequency	Annually
QA/QC procedures	A check meter is also installed near to the export meter to cross check the electricity exported to the grid. The check meter reading is used in case of failure of export meter
Purpose of data	Calculation of baseline emissions
Additional comment	-

Safeguarding principal 4.3.5: Hazardous and non-hazardous waste

Relevant Indicator	SDG	Safeguarding principal 4.3.5:
Data / Parameter		Hazardous and Non-hazardous Waste
Unit		-
Description		The manufacture, trade, release, and use of hazardous and non-hazardous chemicals and/or materials
Source of data		Plant Records
Value(s) monitored		0
Measurement methods and procedures		Manual

Monitoring frequency	Once in a Monitoring period
QA/QC procedures	The waste is disposed to the waste handlers and the firm will comply with all the local laws for monitoring and disposal.
Purpose of data	Analysis of safeguarding principle
Additional comment	-

D.3. Comparison of monitored parameters with last monitoring period

Not Applicable for non-community service activities

D.4. Implementation of sampling plan

Sampling is not required, as the project activity is a solar power plant.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG 7 & 13: -

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

Where,

BE_y - Baseline emissions in year y, (tCO₂e/yr)

EG_{facility,y} - Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh/yr)

EF_{grid,CM,y} - Combined margin CO₂ emission factor for grid connected power generation in year y

$$EG_{facility,y} = EG_{y, Export} - EG_{y, Import}$$

$$\begin{aligned} \text{BEy} &= 289,877 * 0.9419 \\ &= 273,034 \text{ tCO}_2\text{e (Rounded down)} \end{aligned}$$

Thus, the estimated baseline situation of each SDG outcome is summarised as follows;

Item	Baseline value
SDG 7: Affordable and Clean Energy	No Activities in the baseline
SDG 8: Decent Work and Economic Growth	No Activities in the baseline
SDG 13: Climate Action	Emission of 273,034 tCO ₂ e

SDG 8: -

Employment opportunities created for 12 persons in total and 06 trainings were conducted during the current monitoring period.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

The company conducts regular surveys during construction as well as O&M phases in the villages near project locations to check the requirement of facilities by the villages. The following SDGs are impacted every year.

SDG 7: Affordable and Clean Energy:

Measurement Method: - Electricity produced and supplied to the grid is monitored through energy meter. Net electricity is calculated by state electricity board and PD on monthly basis and provided in the share certificate/monthly generation report/JMR (Joint meter reading) or equivalent. The other parameters used for net electricity supplied to grid are mentioned in monitoring plan.

QA/QC Process: This parameter is monitored monthly and value of parameter cross checked with invoices.

During Monitoring period –01/01/2021 to 15/11/2023 (inclusive of both the dates)

Quantity of net electricity supplied to the grid (MWh) = 289,877

SDG 8: Decent Work and Economic Growth

The monitoring parameter for the SDG 8 are Number of trainings provided to employees & O&M staff, equal payment for equal work for staffs involved in the project. During the project scenario, the following is achieved.

During Monitoring period –01/01/2021 to 15/11/2023 (inclusive of both the dates)

Quality of Employment – 06 trainings

Quantitative employment and income generation - 12 employees (09 skilled, 1 semi-skilled, and 2 unskilled)

These can be crosschecked from the training records & employment records

SDG 13: Climate Action

As per the Section 5.4, Para 31 of the applied Methodology ACM0002 version 20.0, "For most renewable energy power generation project activities, $PE_y = 0$.

However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y = Project emissions in year y (tCO_2e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO_2/yr)

PEGP,_y = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (tCO₂e/yr)

PEHP,_y = Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)“

For most renewable energy power generation project activities, PE_y = 0

As the project activity is the installation of a new grid-connected Solar power plant/unit and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore PEFF,_y , PEGP,_y , PEHP,_y is equal to zero and thus, PE_y = 0.

E.3. Calculation of leakage

No leakage emissions are applicable.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
7	MWh of renewable energy generated	0	289,877	289,877
8	SDG 8: Decent Work and Economic Growth	0	06 Trainings 12 Employees Unskilled – 2 Semi-skilled -1 Skilled - 9	06Trainings 12 Employees Unskilled – 2 Semi-skilled -1 Skilled - 9
13	Emission Reduction	273,034	0	273,034

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ¹⁰ achieved during this monitoring period
7	100,020 MWh/Year (365 days) 287,455 MWh for the current Monitoring period (1049 days)	289,877 MWh
8	1 training/year	06 Trainings 12 Employees
13	94,209 tCO ₂ e/Year (365 days) 270,754 tCO ₂ e for the current monitoring period (1049 days)	273,034 tCO ₂ e

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period

$$= 94,209 * 1049 \text{ (days)} / 365$$

$$= 270,754 \text{ tCO}_2\text{e}$$

whereas actual emission reductions achieved are 273,034 tCO₂e, which is 0.84% higher than the estimated emission reductions.

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

SDG 13:

¹⁰ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

The actual achieved emission reduction for this monitoring period is 0.84% higher than estimated value in the PDD and is within the sensitivity range.

Estimated ERs for the current MP as per PDD version 05 dated 18/05/2023 (applicable for CP2):

$$= 94,209 * 1049 \text{ (days)} / 365$$

$$= 270,754 \text{ tCO}_2\text{e}$$

whereas actual emission reductions achieved are 273,034 tCO₂e, which is 0.84% higher than the estimated emission reductions.

SDG 7:

It is to be noted here that as per the registered PDD estimated electricity generation to be achieved from the project activity for the current monitoring period is

$$= 100,020 \text{ MWh/Year}$$

$$= 100,020 * 1049 \text{ (days)} / 365$$

$$= 287,455 \text{ MWh}$$

whereas actual electricity generation achieved are 289,877 MWh, which is 0.84% higher than the estimated electricity generation. The achieved PLF during current monitoring period is 23.03%.

SDG 8:

As per the registered PDD employment to 20 people and 1 training per year was estimated. The total number of employees currently engaged in the project are 12 people and 06 trainings were provided during the current MP which is conservative.

SECTION F. SAFEGUARDS REPORTING

Safeguarding Principle 9.5 Hazardous and Non-hazardous Waste

Data / Parameter	Hazardous and Non-hazardous Waste
Mitigation Measures followed	The waste is disposed to the waste handlers and the firm comply with all the local laws for monitoring and disposal.
Source of data	Plant Records
Additional comment	All the mitigation measures are implemented at the site. This is confirmed from site HSE log book and O&M team.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

As a part of continuous feedback from stakeholders, the grievances register is being placed at site and is being continuously monitored and addressed on regular basis and maintained in a registered site office.

During the current monitoring period no grievances have been received. The scan copies have been provided to the VVB.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

No grievances received in the previous monitoring period, thus no follow up required

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

Not applicable

Appendix: 1 Breakdown details

Date	Category of Breakdown State	Inverter	Fault Description	Total BD Hours
13/08/2021	PLANT	INV019	Block 07 Inv 19	6.5
27/09/2021	PLANT	INV067	BLK05 INV67	5.4
30/09/2021	PLANT	INV063	BLK05 INV63	3.6
30/09/2021	PLANT	INV067	BLK05 INV67	2.6
13/08/2022	PLANT	INV019	Block 07 Inv 19	1.4
27/09/2022	PLANT	INV067	BLK05 INV67	0.5
30/09/2022	PLANT	INV063	BLK05 INV63	1.2
30/09/2022	PLANT	INV067	BLK05 INV67	14
13/10/2022	PLANT	All Inverter	13 nos of DC String fault	5.7
14/10/2022	PLANT	All Inverter	13 nos of DC String fault	6.1
15/10/2022	PLANT	All Inverter	13 nos of DC String fault	3.6
17/10/2022	PLANT	All Inverter	11 nos of DC String fault	4.8
17/10/2022	PLANT	All Inverter	11 nos of DC String fault	6.7
18/10/2022	PLANT	All Inverter	11 nos of DC String fault	7.4
18/10/2022	PLANT	All Inverter	11 nos of DC String fault	8.1
19/10/2022	PLANT	All Inverter	11 nos of DC String fault	5.3
19/10/2022	PLANT	All Inverter	11 nos of DC String fault	3.1
20/10/2022	PLANT	All Inverter	11 nos of DC String fault	2.6
20/10/2022	PLANT	All Inverter	12 nos of DC String fault	4.7
20/10/2022	PLANT	All Inverter	11 nos of DC String fault	5.4
21/10/2022	PLANT	All Inverter	11 nos of DC String fault	6.2
21/10/2022	PLANT	All Inverter	11 nos of DC String fault	4.8
21/10/2022	PLANT	All Inverter	12 nos of DC String fault	5.1
22/10/2022	PLANT	All Inverter	11 nos of DC String fault	3.7
22/10/2022	PLANT	All Inverter	12 nos of DC String fault	5.6

22/10/2022	PLANT	All Inverter	11 nos of DC String fault	2.1
31/10/2022	PLANT	All Inverter	12 nos of DC String fault	4.9
03/11/2022	PLANT	INV067	Inverters under breakdown due to flood	7.2
05/11/2022	PLANT	INV067	Inverters under breakdown due to flood	8.6
07/11/2022	PLANT	INV067	No's INV breakdown due to water logging.	6.8
10/11/2022	PLANT	None	02 inverter under breakdown due to flood	7.9
12/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	8.1
12/11/2022	PLANT	None	02 inverter under breakdown due to flood	9.4
12/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	7.8
13/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	9.4
13/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	8.1
14/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	7.8
14/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	6.9
14/11/2022	PLANT	None	02 inverter under breakdown due to flood	5.8
15/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	7.1
15/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	8.4

15/11/2022	PLANT	None	02 inverter under breakdown due to flood	5.9
16/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	5.3
17/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	4.1
18/11/2022	PLANT	None	02 inverter under breakdown due to flood	6.2
18/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	5.6
20/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	5.5
20/11/2022	PLANT	None	02 inverter under breakdown due to flood	4.7
20/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	6.8
21/11/2022	PLANT	INV017	01 inverter under breakdown due to flood	6.7
22/11/2022	PLANT	INV067	01 inverter under breakdown due to flood	7.1
22/11/2022	PLANT	None	02 inverter under breakdown due to flood	8.3
25/11/2022	PLANT	None	02 Inverters under breakdown due to flood	8.5
25/11/2022	PLANT	INV067	1 inverter under breakdown due to flood	7.5
26/11/2022	PLANT	INV067	1 inverter under breakdown due to flood	8.6
05/04/2023	PLANT	None	2No's INV B/D due to 3CX240 Sq mm AC LT Cable	2.5

			(R&Y Phase) Ground Fault.	
06/04/2023	PLANT	All Block	132 KV line Shutdown taken from UPPTCL 200 KV Bajariya substation for ABT Meter Calibration at Plant 132 kV Switchyard end.	3.3
08/04/2023	PLANT	113.114115 1	MCCB 29 Trip Due to the INV114 DC side Blast.	1.5
08/04/2023	PLANT	114	INV114 DC Side Burnt & Blast.	2.2
10/04/2023	PLANT	78	PV01 MC4 Connector was melt.	0.7
10/04/2023	PLANT	All Block	UPPTCL shutdown taken for M&A work at 220 kV TL line.	0.8
10/04/2023	PLANT	All Block	UPPTCL shutdown taken for M&A work at 220 kV TL line.	0.9
12/04/2023	PLANT	45	INV45, 35Sq mm AC LT Cable Ground fault.	0.6
14/04/2023	PLANT	101	Alarm Abnormal DC Circuit MPPT01 Fault.	0.6
23/04/2023	PLANT	11	ASB02 Mechanical Problem issue.	0.5
23/04/2023	PLANT	72	ASB02 Mechanical Problem issue.	0.7
26/04/2023	PLANT	19	Y-String Breakdown due to the MC4 Connector Melt.	0.4
27/04/2023	PLANT	113	Bottom of Purline.	1.7
30/04/2023	PLANT	29	ASB02 Mechanical Problem issue.	2.8
30/04/2023	PLANT	72	MC4 connector open	1.4

09/05/2023	PLANT	35	String Breakdown due to the MC4 Connector Melt.	2.1
12/05/2023	PLANT	8	INV down due to LIR in PV 08	1.5
29/05/2023	PLANT	18	INV down due to LIR in PV 06	1.3
07/06/2023	PLANT	32	Pv 08 Breakdown due to the DC Cable Ground Fault.	1.2
01/07/2023	PLANT	All Block	ASB Trip due to the Malfunctioning.	2.2
17/07/2023	PLANT	None	Incomer 04 Trip Due to the End termination kit failure.	0.9
17/07/2023	PLANT	None	PV07 MC4 Connector was Open	3.7
27/07/2023	PLANT	None	MC4 connector open	5.6
29/07/2023	PLANT	All Block	MC4 connector was melt	2.1
06/08/2023	PLANT	None	Water Logging Flood	4.9
06/08/2023	PLANT	12	Water logging heavy rain	7.2
06/08/2023	PLANT	None	Incomer 3 manually tripped for IDT 1 Charging	8.6
30/08/2023	PLANT	All Block	LT Panel to SACU supply cable issue.	6.8
31/08/2023	PLANT	7	Jumper Breakdown	7.9
31/08/2023	PLANT	3	Water Logging Heavy Rain	8.1
05/09/2023	PLANT	44	INV B/d Due to Abnormal INV. Circuit.	9.4
05/09/2023	PLANT	74	Bottom of Parline.	7.8
13/09/2023	PLANT	69	MCCB tripped due to over heating	9.4
18/09/2023	PLANT	None	MCCB tripped due to 35sq	8.1

			mm lug melt in ASB02	
27/09/2023	PLANT	All Block	INV down due to LIR in PV 06	7.8
27/09/2023	PLANT	All Block	INV B/d Due to Abnormal INV. Circuit.	6.9
27/09/2023	PLANT	All Block	35 sq mm LT cable got punctured	5.8
21/10/2023	PLANT	109	Block 06 Inverter 69 DC/AC section burnt inverter under breakdown	7.1

Appendix: 2 Training Records

S.No.	Date of training	Number of Training	Number of participants
1	May-21	Awareness on chemical safety	6
2	July-21	Incident reporting and investigation	6
3	Jun-22	Awareness on chemical safety	6
4	Aug-22	Incident reporting and investigation	6
5	April-23	Incident reporting and investigation	8
6	May-23	Awareness on chemical safety	7

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption