Monitoring report form
(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT		
Title of the project activity	Biomass based power project by Shri Shyam Warehousing and Power Pvt. Ltd.	
UNFCCC reference number of the project activity	7261	
Version number of the monitoring report	01	
Completion date of the monitoring report	10/01/2016	
Monitoring period number and duration of this monitoring period	First periodic monitoring period 13/12/2012 to 31/12/2015	
Project participant(s)	Shri Shyam Warehousing and Power Pvt. Ltd.	
Host Party	India	
Sectoral scope(s)	1 : Energy industries (renewable - / non-renewable sources)	
Selected methodology(ies)	AMS-I.C. ver. 19 - Thermal energy production with or without electricity	
Selected standardized baseline(s)	N/A	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	104,673	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	2,295	106,121

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>>
The project activity is a 10 MW biomass based power plant implemented by Shri Shyam Warehousing and Power Pvt. Ltd (SWPPL) and it is located in Banari, state of Chhattisgarh, India.

The purpose of the project activity is to generate electricity through the combustion of renewable biomass. The project activity has generated electricity by burning renewable fuel, rice husk and mixing it with coal fines. The generated electricity has been exported to the NEWNE grid through sale to the Chhattisgarh State Electricity Board (CSEB).

The project activity comprises the installation of a high pressure boiler of 50 tonnes per hour capacity (68 kg/cm2, 490±5 °C) and an extraction bleed cum condensing type steam turbine generator set of 10 MW capacity. The project activity also comprises the installation of ancillary equipment's to generate electricity for the grid from a renewable energy source (rice husk).

During this monitoring period the project activity has generated electricity of 219,324.84 MWh and thereby achieved a total emission reduction of 108,416 tCO_2e.

A.2. Location of project activity

>>
Village Banari, District Janjgir, Chattisgarh, India

Latitude 21° 59' 51.83" N
Longitude 82° 31'04.59" E

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
India (host)	Private entity: Shri Shyam Warehousing and Power Pvt. Ltd.	No
United Kingdom of Great Britain and Northern Ireland	Private entity: Agrinergy Pte Ltd	No

A.4. Reference of applied methodology and standardized baseline

>>
Sectoral scope 1 - Energy industries (renewable/non-renewable sources)
Type I - Renewable Energy Projects
Category C – Thermal energy production with or without electricity

A.5. Crediting period of project activity

>>

13/12/2012 to 12/12/2019

A.6. Contact information of responsible persons/entities

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Mr. Ramesh Agrawal
General Manager
Phone number: +91-9425230096
FAX: +91-07817222412

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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The project produces renewable energy from the combustion of a renewable biomass. The technology employed is a biomass fired plant, which consists mainly of a boiler and turbine generator.
The project activity generates electricity a 10000 kW capacity extraction bleed cum condensing type steam turbo-generator, which is driven using steam from a 50 TPH (tonnes per hour) AFBC boiler. The technical parameters of boiler and turbo-generator are given below:

Travelling grate boiler
MCR (Maximum Continuous Rating)
50 TPH Steam parameters at turbine inlet
65 kg/cm2(A), 485°C

Turbo-generator
Steam outlet parameters 68 kg/cm2(A), 490±5°C
Generator rating 10 MW, 50Hz, 11 kV

The steam generated from the boiler drives steam turbine at the rated pressure and temperature coupled to an electric generator. The steam for the process steam requirements is trapped off from an intermediate stage and is directly fed to the process steam header. The power generated is evacuated to CSEB, substation. As proposed project activity is cogeneration activity, some quantity of steam generated from project activity is also meeting the steam requirement of existing rice mills located in the project premises.

The steam generated from the boiler is 47.06tph, out of which 0.1tph and 0.25tph is go in a sealing and ejector process respectively whereas 46.71tph is going to turbine. From turbine 12tph of steam is consumed in the process, 29.03tph is utilised for condenser and 6.66tph is utilised in the de-aerator. The power generated from the project activity is exported to the CSEB grid at Banari 220kV/33kV sub-station at 33kV through an independent single circuit 33kV overhead line from the proposed project activity. The sub-station is located at a distance of 200m from the project activity.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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There is no temporary deviation proposed for this project activity.

B.2.2. Corrections

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No corrections.

B.2.3. Changes to start date of crediting period

>>
Not Applicable

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

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Not Applicable

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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Not Applicable

B.2.6. Changes to project design of registered project activity

>>
Not Applicable

B.2.7. Types of changes specific to afforestation or reforestation project activity

>>
Not Applicable

SECTION C. Description of monitoring system

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Net Electricity Exported:

Main meter and check meter with accuracy of 0.2 has been installed at the grid substation of the Chhattisgarh State Electricity Board (CSEB) to monitor the net electricity exported to the grid. A representative of the project owner and the CSEB takes the main meter reading once in a month as agreed in the signed Power Purchase Agreement (PPA). The data is collated on monthly basis and is considered for emission reduction calculation.

The Site Head is responsible for the monthly JMR (electricity exported and electricity imported). He is responsible in transmitting the monthly data to the Plant Manager. The electricity meter is calibrated annually by state utility. The Instrumentation Engineer is in charge of maintaining the records of the calibrations on site.

Fuel consumption
The consumption of fuel for the generation of electricity is monitored at the weighbridge installed at the factory. The weighbridge records can be tallied against transporters receipts or against the computer generated payment invoices.

The Plant Manager collates monthly the consumption of all types of fuels and the number of trucks of the daily data.

The Instrumentation Engineer is in charge of the calibrations and of maintaining the records of the calibrations of the weighbridge at the site.

General
The organization trains the staff to ensure that the monitoring process is appropriate and effective. The CDM data is collated monthly in an excel file maintained by the Plant Manager.

All emission reduction related data is available for a minimum of 2 years following issuance of certified emission reductions or the end of crediting period, whichever is later and the storage of this data is the responsibility of the project owner.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter)

Data / Parameter:	**$EF_{CO2,grid,y}$**
Unit:	tCO2/MWh
Description:	Grid emission factor
Source of data:	Central Electricity Authority http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver5.pdf
Value(s) applied):	0.8400
Choice of data or measurement methods and procedures	

Purpose of data:	This value has been provided by the Central Electricity Authority (CEA), a government body for the NEWNE grid in India.
Additional comment:	Specified *ex-ante*

Data / Parameter:	$EF_{grid,OM,y}$
Unit:	tCO2/MWh
Description:	Operating Margin for Grid
Source of data:	Central Electricity Authority http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver5.pdf
Value(s) applied):	1.0049
Choice of data or measurement methods and procedures	
Purpose of data:	This value has been provided by the Central Electricity Authority (CEA), a government body for the NEWNE grid in India.
Additional comment:	Specified *ex-ante*

Data / Parameter:	$EF_{grid,BM,y}$
Unit:	tCO2/MWh
Description:	Build Margin for Grid
Source of data:	Central Electricity Authority http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver5.pdf
Value(s) applied):	0.6751
Choice of data or measurement methods and procedures	
Purpose of data:	This value has been provided by the Central Electricity Authority (CEA), a government body for the NEWNE grid in India.
Additional comment:	Specified *ex-ante*

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Data / Parameter:	$EG_{BL,y}$
Unit:	MWh/year
Description:	Quantity of net electricity supplied to the grid in year y (MWh)
Measured/ Calculated / Default:	Measured
Source of data:	Energy Bills generated
Value(s) of monitored parameter:	195,293.40
Monitoring equipment:	Energy Meter
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly. Accuracy Class : 0.2s

Calculation method (if applicable):	$EG_{BL,y}$ is calculated based on the $EG_{Export,y}$ and $EG_{Import,y}$ as below: $E_{GBL,y} = EG_{Export,y} - EG_{Import,y}$ The metering for $EG_{Export,y}$ and $EG_{Import,y}$ is carried out using the two way energy meter located at common metering point/interconnection point. The meter is capable of continuous monitoring. The monthly recording has been done manually and the records are maintained electronically. Joint meter reading is done in the presence of an official from state electricity board and project owner.
QA/QC procedures:	The meters are calibrated once every three years. Net electricity export can be cross checked with invoice.
Purpose of data:	Baseline Emission
Additional comment:	All data is available for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later.

Data / Parameter:	**$B_{biomass,y}$**
Unit:	Tonnes
Description:	Net quantity of biomass consumed in year *y*
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	224791.7613
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.
Calculation method (if applicable):	Each truck that enters the site is recorded at the weighbridge installed at the factory. The biomass quantity is calculated on dry basis based on the moisture content of biomass.
QA/QC procedures:	The weighbridge records are tallied against transporters receipts or against the computer generated payment invoices. Calibration frequency - annually Cross checked with annual energy balance.
Purpose of data:	Baseline Emission
Additional comment:	All data is available for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later.

Data / Parameter:	**$B_{moisture}$**
Unit:	% water content
Description:	Moisture content of the biomass
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	8.92
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.

Calculation method (if applicable):	On-site measurement The moisture content of rice husk is monitored for every batch and average value of all three batches for a day recorded in logbook signed off by Controller, Laboratory. Daily data aggregated into monthly data. The moisture content (% of water) data are obtained from the laboratory records. The weighted average of monthly data is calculated for this monitoring period.
QA/QC procedures:	The moisture content is measured by laboratory.
Purpose of data:	Baseline Emission
Additional comment:	In case of dry biomass residue, this parameter is not necessary.

Data / Parameter:	**NCV_k**
Unit:	GJ/kg
Description:	Net calorific value of biomass
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	0.01352401
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.
Calculation method (if applicable):	Measurement in laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. The average value can be used for the rest of the crediting period. Measure the NCV based on dry biomass.
QA/QC procedures:	Check the consistency of the measurements by comparing the measurement results with, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC.
Purpose of data:	Baseline Emission
Additional comment:	Determine once in the first year of the crediting period.

Data / Parameter:	**$FC_{coal,j,y}$**
Unit:	Tonnes/yr
Description:	Quantity of coal fines used in the project activity in the year y
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	55,593.510
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.

Calculation method (if applicable):	The amount of coal used in the project activity is measured via a calibrated weighbridge system as and when consumed on continuous basis. The total quantity of coal procured for the project activity is completely combusted in the boiler. Hence, the total quantity of coal procured and quantity of coal combusted is considered as the same for the project activity.
QA/QC procedures:	Weigh bridge undergoes maintenance / calibration subject to appropriate industrial standards, at least annually. The data recorded were cross checked against purchase receipt. Cross check the measurements with an annual energy balance that is based on purchased quantities and stock changes, and the calibration frequency is once in three years.
Purpose of data:	Baseline Emission
Additional comment:	The data on quantity of coal combusted would be collected, recorded and archived separately for entire crediting period +2 years.

Data / Parameter:	**$EF_{CO2,coal,y}$**
Unit:	tCO_2 /GJ
Description:	CO_2 emission factor for coal
Measured/ Calculated / Default:	Calculated
Source of data:	CEA
Value(s) of monitored parameter:	0.0997
Monitoring equipment:	CEA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	A default value is applied as values from the fuel supplier in not available. Any future revisions of the IPCC Guidelines will be taken into account.
QA/QC procedures:	Project Participant has no control on the parameter. Hence, no QA/QC procedures are applicable.
Purpose of data:	Baseline Emission
Additional comment:	

Data / Parameter:	**$NCV_{coali,y}$**
Unit:	GJ/kg
Description:	Net calorific value of coal
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	0.0142358
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.
Calculation method (if applicable):	The sample of type of coal is collected from the plant according to the procedures of sample collection for analysis and analysed by reputed laboratories. The measurements are carried out according to relevant standards.

QA/QC procedures:	The consistency of the measurements is compared with the measurement of previous years, relevant data sources.
Purpose of data:	Baseline Emission
Additional comment:	The data will be archived for 2 years after the end of crediting period.

Data / Parameter:	**Diesel consumption ($FC_{i,j,y}$)**
Unit:	MT/year
Description:	Quantity of diesel consumed on site every year.
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	66.00586
Monitoring equipment:	Level Indicator Gauge
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.
Calculation method (if applicable):	A monitoring cell fitted with a level indicator gauge above the fuel tank of the D.G Set is used to monitor the diesel consumption every month. Logbook is maintained for the same purpose. The fuel tank of the D.G. Set is filled every five to eight months (As the consumption is very low) and with the help of level indicator gauge reduction in diesel level (on consumption) is monitored every month.
QA/QC procedures:	The level indicator gauge is calibrated by Government accredited/ ISO certified agency every two years. The diesel consumption quantities were crosschecked with the record of the quantity of diesel issued by the stores manager and maintained in a logbook in the storeroom.
Purpose of data:	Baseline Emission
Additional comment:	All monitored data will be kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period, whichever is later.

Data / Parameter:	**CO_2 emission factor ($EF_{CO2,i,y} = EF_{diesel}$)**
Unit:	tCO2 e/ TJ
Description:	CO2 emission factor for Diesel Oil
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	74.8
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.
Calculation method (if applicable):	IPCC 2006 default value of CO2 Emission Factor (for diesel oil) is used for calculating project activity emissions. The default value of CO2 Emission Factor has been calculated by taking the carbon content (default value), carbon oxidation factor (default value) and mass conversion factor of 3.666 into account.

Additional comment:	

Data / Parameter:	**Net Calorific Value ($NCV_{i,y} = NCV_{Diesel}$)**
Unit:	GJ/T
Description:	Net calorific value of Diesel Oil
Measured/ Calculated / Default:	Calculated
Source of data:	Plant records
Value(s) of monitored parameter:	43.3
Monitoring equipment:	Manually
Measuring/ Reading/ Recording frequency:	Measured Daily and recorded monthly.
Calculation method (if applicable):	Default Net calorific value (for diesel oil) provided in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories has been used for calculating project activity emissions.
Additional comment:	

D.3. Implementation of sampling plan

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No sampling plan is involved.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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Baseline Emissions

$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$

Where:

BE_y Baseline Emissions in year y (tCO_2)

$EG_{BL,y}$ Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO2,grid,y}$ is calculated using the data from the "CO_2 Baseline Database for the Indian Power Sector – User Guide", Version 5, which is the official source of the Ministry of Power, Government of India.

$$EG_{BL,y} = EG_{Export,\ y} - EG_{Import,\ y}$$

$$EG_{BL,y} = 219926.22 - 601.38$$

$$EG_{BL,y} = 219324.84$$

Where:

$EG_{Export, y}$ Quantity of net electricity exported to the grid in year y (MWh)
$EG_{Import, y}$ Quantity of electricity imported from the grid in year y (MWh)

$BE_y = EG_{BL,y} \times 0.8400$

$BE_y = 219324.84 \times 0.8400$

$= 184,230\ tCO_2e$ (Rounded Down)

E.2. Calculation of project emissions or actual net GHG removals by sinks

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$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

$PE_{FC,j,y}$ the CO2 emissions from fossil fuel combustion in process *j* during the year *y* (tCO2 / yr);
$FC_{i,j,y}$ the quantity of fuel type *i* combusted in process *j* during the year *y* (mass or volume unit / yr);
$COEF_{i,y}$ the CO2 emission coefficient of fuel type *i* in year *y* (tCO2 / mass or volume unit);

i the fuel types combusted in process *j* during the year *y.*

$$COEF_{iy} = NCV_{iy} \text{ X } EF_{CO2,I,y}$$

$COEF_{iy}$ the CO_2 emission coefficient of fuel type *i* in year y (tCO_2/ mass or volume unit);

NCV_{iy} the weighted average net calorific value of the fuel type *i* in year y (GJ/ mass or volume unit);

$EF_{CO2,I,y}$ weighted average CO_2 emission factor of fuel type *i* in year y (tCO_2/GJ);
i the fuel types combusted in process *j* during the year y

Project Emission Coal:

$COEF_{iy} = NCV_{iy} \text{ X } EF_{CO2,I,y}$

$COEF_{iy} = 0.0142358 \text{ X } 0.0997$

$= 0.001419309$

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

$PE_{Coal} = (53,106.788 \text{ X } 0.001419309) \text{ X } 1000 = 75,375$ (Rounded Up)

Project Emission Diesel:

$COEF_{iy} = NCV_{iy} \text{ X } EF_{CO2,I,y}$

$COEF_{iy} = 43.3 \text{ X } 74.8$

$= 3238.84$

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

$PE_{Diesel} = (135.2952 \text{ X } 3238.84) / 1000 = 439$ (Rounded Up)

Total Project Emission = PE_{Coal} + PE_{Diesel}

$= 75{,}814\ tCO_2e$

E.3. Calculation of leakage

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In accordance of the footnote of the methodology AMS I.C, since the transport of biomass is from within 200 kilometres, the emissions related to transport of biomass shall be neglected. Hence leakage emissions in this case are neglected.

A biomass assessment survey has been undertaken ex-ante by the project proponents to account for leakage if any.

E.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	GHG emission reductions or net GHG removals by sinks (t CO_2e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	184,230	75,814	0	2,295	106,121	108,416

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	104,673	108,416

E.6. Remarks on difference from estimated value in registered PDD

>>

The actual emission reduction achieved during this monitoring period is higher than the estimated emission reduction, but the values are well within the limit of sensitivity parameters mentioned in the registered PDD.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☐ Project participant ☐ Person/entity responsible for completing the CDM-MR-FORM
Organization name	Shri Shyam Warehousing and Power Pvt Ltd
Street/P.O. Box	Station Road, Post office Naila, Champa
Building	
City	Janjgir
State/region	Chhattisgarh
Postcode	
Country	India
Telephone	
Fax	
E-mail	
Website	
Contact person	
Title	General Manager
Salutation	Mr
Last name	Ramesh
Middle name	
First name	Agrawal
Department	
Mobile	+91-9425230096
Direct fax	+91-07817222412
Direct tel.	
Personal e-mail	shyamwarehousingp@yahoo.in

Document information

Version	*Date*	*Description*
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

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