



VALIDATION REPORT **SHYAM DRI POWER LIMITED**

VALIDATION OF THE **SHYAM DRI WHR CPP**

BUREAU VERITAS CERTIFICATION

REPORT No. INDIA-VAL/127.49/2008

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VALIDATION REPORT

Date of first issue: 20/02/2008	Organizational unit: Bureau Veritas Certification Holding SAS
Client: Shyam DRI Power Ltd.,	Client ref.: Mr. Sanjay Agrawal

Summary:

Bureau Veritas Certification has made the validation of the Shyam DRI WHR CPP project of Shyam DRI Power Limited located in Village Pandoli & Nishanbanga, Sambalpur District, Orissa State, India, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology Category-I, Energy Industries (Renewable / non-renewable) / ACM 0004 (Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation / Version 02 (03rd March 2006) / Scope: 01 and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.: INDIA-val/127.49/2008	Subject Group: CDM
Project title: SHYAM DRY WHR CPP	
Work carried out by: Mr. R. Sankaranarayanan – Team Leader Mr. P. Srinivas – Team Member Dr. Ashok Mammen – Sector Specialist Mr. Subrata Ghoshal – Team Member Mr. Sushil Budhia – Financial Expert	
Work verified by: Mr. H B Muralidhar	
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Indexing terms

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Abbreviations

ABC	After Burn Chamber
AFBC	Atmospheric Fluidized Bed Combustion
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CPP	Captive Power Plant
DOE	Designated Operational Entity
DRI	Direct Reduced Iron
ESP	Electro Static Precipitator
GHG	Green House Gas (es)
I	Interview
IETA	International Emissions Trading Association
MoV	Means of Verification
NGO	Non Government Organization
O & M	Operation and Maintenance
PCF	Prototype Carbon Fund
PDD	Project Design Document
PLF	Plant Load Factor
STG	Steam Turbine Generator
UNFCCC	United Nations Framework Convention for Climate Change
WHRB	Waste Heat Recovery Boiler



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1 INTRODUCTION

Shyam DRI Power Limited has commissioned Bureau Veritas Certification to validate its CDM project Shyam DRI WHR CPP (hereafter called “the project”) at Village Pandoloi & Nishanbanga in Sambalpur District, Orissa, India.

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 GHG Project Description

The proposed project activity is to generate electricity by using waste heat contained in the waste flue gases released from 2 ABCs (After Burning Chamber) of the 2 DRIs (Direct Reduction Iron) sponge iron kilns of 350 TPD each. The heat contained in waste gases will be transferred to water, which converts water in to steam in 2 WHRBs (Waste Heat Recovery Boiler) generating around 76 TPH steam (38 tonnes X 2 Nos.), at 66-ata pressure and 490±50°C temperature. The steam thus produced will be fed into a STG (Steam Turbine Generator) through a common header to generate electricity from Recovered Waste Heat. Steam from the 2 WHRBs will produce 15 MW electricity in a 25 MW turbine whose balance steam requirement will be met by one AFBC boiler. Presently this power is used for their captive consumption and surplus power is exported to the grid.



Shyam DRI is putting up an integrated steel complex to produce Sponge Iron Steel Billets; Rolled products, Ferro Alloys, Coal Washer along with the captive power. The company is implementing the project in 2 phases. In phase - 1, the company has already installed 2 No. DRI sponge iron rotary kiln with 350 TPD capacity using Coal as fuel, Induction Furnace, Ferro Alloys and Rolling Mill, Coal Washery along with aggregate 25 MW captive power plant out of which 15 MW power will be generated from WHRB route (which is the part of the present project activity) and balance 10 MW power will be generated from coal fired AFBC route.

The EB/CDM RIT has suggested that the Validation Report should include : "The actual electricity demand for the sponge iron plant, including the means of validation of this data";

Details of the installed manufacturing capacities and the connected load has been provided in the Table on Page 3_of the PDD. The validation team member Mr. H. B. Muralidahr revisited the site and verified this data personally in December 2008. The Validation Team confirms that the details provided by the PP related to the connected electrical load and unit power consumption are acceptable. During this visit, it was noted that the actual rated capacity of the turbine is 30 MW as was indicated in the PDD. The Consent to operate (legal approval from the State Pollution Control Board) however limits the capacity only for electricity generation upto 25 MW capacity which matches with the description of the project activity of 15 MW generation from the WHRB. The unit power consumption of the processes and products types has been determined from various sources in the public domain.

Sl No	Facilities Installed	Production	Estimated Unit Power consumption of Product	Means of Verification
1	Sponge Iron Production (2 Kilns of 350 TPD each)	200000.00	85 kWh/tonne	Relevant Website, technical papers as stated in the PDD.
2	Rolling Mill/ TMT Bar	60000.00	85 kWh/tonne	Relevant Website, technical papers as stated in the PDD.
3	Induction Furnace (Steel Melting Shop with CCM)	200000.00	750 kWh/tonne	Relevant Website, technical papers as stated in the PDD.
4	Coal Washery	300000.00	15 kWh/tonne	Relevant Website, technical papers as stated in the PDD.
5	Auxiliary for Power Plan	25 MW	10% of Gross generation	Chartered Engineers Certificate and actual verification at Site
6	Light and Fan Load	-		Chartered Engineers Certificate and actual verification at Site



In second phase company will be installing additional 3 DRI Kiln having capacity of 100 TPD each with Preheating Kiln along with 30 MW x 2 Nos. (total 60 MW) power plant out of which 8 MW power will be generated from WHRB route (based on the CDM strength) and balance power will be generated from coal fired AFBC route.

It is expected that captive power requirement of the complex will reach its peak on implementation of the steel plant and Ferro alloy plant for first phase. The presently installed power plant is expected to be sufficient to meet the captive power demand at such peak level.

Further, it is noted that the region is having sufficient coal reserves. Industry has already installed several coal-based power plants. When planning a power plant for captive use, there is a need to provide sufficient excess capacity over and above the expected demand. Further, the power plant would always be commissioned in ahead of the manufacturing set up to ensure that the power is available and reliable when commercial production starts. Therefore, it is expected that there may be some amount of electricity that the project activity would export both during the time that the manufacturing facility is being established and after the commercial production starts. Therefore, part of the electricity generated by project activity will be used to meet the captive demand and any excess available on account of the above-mentioned reasons will be exported to the grid. In the absence of the project activity, equivalent amount of electricity would be generated in a coal based power plant installed within the manufacturing complex.

1.4 Validation team

The validation team consists of the following personnel:

Mr. R Sankaranarayanan

Bureau Veritas Certification Team Leader, Climate Change Verifier

Mr. P Srinivas

Bureau Veritas Certification Climate Change Verifier

Mr. Subrata Ghoshal

Bureau Veritas Certification Climate Change Verifier

Mr. Sushil Budhia – Financial Expert.

Dr Ashok Mammen

Bureau Veritas Certification Sector Specialist.

Mr H B Muralidhar

Bureau Veritas Certification Internal reviewer

2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the Validation and Verification Manual (IETA/PCF). The



protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of five tables. The different columns in these tables are described in Figure 1.

The completed validation protocol is enclosed in Appendix A to this report.



VALIDATION REPORT

Validation Protocol Table 1: Mandatory Requirements

Requirement	Reference	Conclusion	Cross reference
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) or a Clarification Request (CL) of risk or non-compliance with stated requirements. The CAR's and CL's are numbered and presented to the client in the Validation Report.	Used to refer to the relevant protocol questions in Tables 2, 3 and 4 to show how the specific requirement is validated. This is to ensure a transparent validation process.

Validation Protocol Table 2: Requirements checklist

Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in several sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question. (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: Baseline and Monitoring Methodologies

Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements of baseline and monitoring methodologies should be met. The checklist is organized in several sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question. (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.



Validation Protocol Table 4: Legal requirements				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The national legal requirements the project must meet.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question. (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Validation conclusion
If the conclusions from the Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.	This section should summarize the validation team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

Figure 1 Validation protocol tables

2.1 Review of Documents

The Project Design Document (PDD) submitted by Shyam DRI Power Limited and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for Completing the Project Design Document (CDM-PDD), Approved methodology, Kyoto Protocol, Clarifications on Validation Requirements to be Checked by a Designated Operational Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests Shyam DRI Power Limited revised the PDD and resubmitted it on 19/02/2008.

The validation findings presented in this report relate to the project as described in the PDD version 02.

2.2 Follow-up Interviews

On 05/09/2007 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in



the document review. Subsequently, there were discussions and information gathering through telephone conversations and emails for further clarifications that were required for the validation process. Representatives of Shyam DRI Power Limited were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Shyam DRI Power Limited	<ul style="list-style-type: none"> ➤ Environmental legal requirements related to project. ➤ Interaction with Stakeholders. ➤ Sustainable development. ➤ Technology used. ➤ Monitoring plan. ➤ Crediting period. ➤ Approval of host country. ➤ Training of Personnel.
LOCAL Stakeholder	<ul style="list-style-type: none"> ➤ Communication from Project proponent regarding the project. ➤ Discussion of their concern / feed back about the project. ➤ Response from the project proponent.
Indus Financial and Technical Consultants Limited	<ul style="list-style-type: none"> ➤ Project category. ➤ Additionality and investment ➤ Source of data. ➤ Monitoring Methodology. ➤ National criteria for CDM projects.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

To guarantee the transparency of the validation process, the concerns raised are documented in more detail in the validation protocol in Appendix A.

3 VALIDATION FINDINGS

In the following sections, the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.
- 2) Where Bureau Veritas Certification had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 08 (Eight) Corrective Action Requests and 15 (fifteen) Clarification Requests.
- 3) The conclusions for validation subject are presented.



3.1 Project Design

Bureau Veritas Certification recognizes that Shyam DRI Power Limited's Project is helping country fulfill its goals of promoting sustainable development. The project is expected to be in line with host-country specific CDM requirements because -

The main carbon benefit from the facility of the project arises from the displacement of an equivalent amount of electricity to the extent of electricity generated from steam which is produced from waste heat recovered from waste gases in two WHRBs, Equivalent amount of power would have been otherwise generated by installing a boiler of capacity sufficient for the coal based 15 MW captive power plant. At the same time the heat contained in the flue gases would have been let to the atmosphere without any utilization, as the company has no other use for the waste heat and there is no legal requirement to recover the heat for any other use-full purpose. The Project activity achieves the following goals.

- ✓ Utilization of heat energy of waste gas.
- ✓ Meet the captive power requirement without any significant T & D losses.
- ✓ Helps to become self reliant and less dependant on grid supply of electricity.
- ✓ Conserve natural resources namely coal and environment.
- ✓ Promotes the sustainable development.

The Project Scenario is considered additional in comparison to the baseline scenario, and therefore eligible to receive Certified Emissions Reductions (CERs) under the CDM, based on an investment analysis, presented by the PDD, of investment, technological and other barriers, and prevailing practice.

CDM Consideration

Project participant has provided the detailed chronology of events from date of board resolution to the date of submission of project for request for registration. The validation team has verified all the steps for their correctness along-with with their dated evidences and these are found to be in order.

Though CDM consideration was taken in the board meeting dated 10 February 2003, the project was web hosted in July 2007. The reasons for delay were verified to be as follows.

1. Kyoto protocol coming into force on 16 Feb 2005
2. The consultant appointed on 3 June 2005 for preparing project documents could not complete the job to the satisfaction of the project proponent.
3. Second board resolution passed on 15 May 2007 to appoint another consultant for carrying out the activities
4. Appointment of another consultant in 17 May 2007
5. Web hosting of PDD on 06 July 2007

The start date of the project has been considered as 09 / 09 / 2004. This is evident from the Purchase order for 2 nos Waste Heat Recovery Boiler placed on M/s. Thermal Systems, Hyderabad.



The project design is sound and the geographical (Village Pandoli & Nishanbanga Sambalpur District, Orissa, India) and temporal (15 years) boundaries of the project are clearly defined.

For CAR's and CL's, refer Appendix A (Validation protocol) for CARs and CLs

3.2 Baseline and Additionality

The Shyam DRI WHR CPP project uses the approved baseline methodology ACM 0004: "Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation" (Version 02, March 03, 2006). Reference is also made to ACM 0002: "Consolidated baseline methodology for waste gas and / or heat and / or pressure for power generation" (Version 06, dated 19th May 2006) and the Tool for the demonstration and assessment of additionality (Version 04, EB 36).

The approved methodology applies to electricity generation project activities:

- ✓ That displaces electricity generation with fossil fuels in the electricity grid or displaces captive electricity generation from fossil fuels.
- ✓ Where no fuel switch is done in the process where the waste heat or pressure or the waste gas is produced after the implementation of project activity.

The project activity meets the applicability as given below:

- ✓ Steam produced by WHRBs is by recovering heat from flue gases coming out of DRI sponge iron kiln, is used to generate electricity.
- ✓ In the absence of the Project activity, the electricity requirement would have been met by coal based captive power generation. The CO₂ emission reduction will be achieved by reduction of corresponding CO₂ emissions in fossil fuel based captive power plants of the company. Refer discussions under section 1.3 above.
- ✓ Project Participant has confirmed that there will be no fuel switch either in sponge iron manufacturing process, or in WHRB power generation after the implementation of the project activity. This will have to be checked during the verification.

The baseline scenario alternatives should include all possible options that provide or produce electricity for in-house consumption and/or sale to grid and/or other consumers. The project participant shall exclude baseline options that:

- ✓ do not comply with legal and regulatory requirements; or
- ✓ depend on key resources such as fuels, materials or technology that are not available at the project site.

The possible alternative baseline scenarios are the following:

- a. Proposed project activity not undertaken as a CDM activity.
- b. Import of electricity from grid.
- c. New CPP based on Diesel oil as alternative fuels.
- d. New CPP based on Gas alternative fuels.



- e. New CPP based on Coal as other alternative fuels.
- f. A combination of b, c, d and e.
- g. Alternative use of waste heat from flue gases.
- h. The continuation of the current situation.

These alternatives are described in a transparent manner in the PDD.

The validation team has analyzed these as below:

Project Participant was using grid power for the sponge iron manufacturing. However, this was practiced only till the power plant was commissioned. Hence the alternative 'continuation of the current situation' is really not relevant though discussed in the PDD. For the same reason, import of electricity from grid is also not a plausible alternative.

The Indian ferrous industry is not known to have any practical use of waste gases other than for energy. Hence alternative 'g' above is not a plausible alternative.

Natural gas is not available in the region and hence is not a plausible alternative. Though diesel is available in the region and power generation from diesel is allowed, it is common knowledge that the levelised cost for diesel based power plants is high compared to a coal based power plant. Hence, if it is shown that the project activity is economically less attractive than or faces barriers that are not faced by a coal based power plant, the alternative of diesel based power generation need not be assessed separately.

Among all the above alternatives, two realistic and plausible alternatives remain viz. proposed project activity not undertaken as a CDM activity and a new CPP based on coal as fuel.

Mini steel plant is a continuous process industry and any disruption in supply of power causes heavy losses to the industry apart from damaging expensive equipment and furnace lining. Once the partially molten material gets solidified, it requires electricity to melt it again. This repetition of the process entails double consumption of electricity for the same operation apart from the loss in production. It may be noted that power outages exist in all states of India and the project activity is one of the reasons for tapping the energy from hitherto untapped potential, (to overcome the problems stated above) which could not have been possible without CDM initiative.

The region of project being a coal rich area along with the nearby state of Chattisgarh, the natural choice would be to have coal based power plant to meet the captive requirements.

Based on the economic analysis provided in the PDD, the cost of power based on the chosen alternative of new CPP based on coal as other alternate fuels was found to be most economical and hence chosen as the baseline.

Based on the above stated independent analysis by the validation team and evidence received during site visit, interviews and further interactions and



information that Project Participant provided, the validation team has accepted the justification provided in the PDD. The economically most attractive alternative (viz. new CPP based on coal as other alternate fuel) among the alternatives mentioned above is therefore accepted as the baseline scenario, since such alternative is not expected to face any prohibitive barriers that could have prevented it from implementation. The fact that Project Participant has already installed a coal-based power plant in addition to the project activity proves that the baseline indeed would be power generation by a coal-based power plant

Additionality of the project activity is determined with the application of various steps of the "Tool for Demonstration and Assessment of Additionality, Version 4. Validation Team's analysis of the application of the additionality is as follows:

- I. **Identification of alternatives to the project activity:** All the selected alternatives are in compliance with the existing laws and regulations of India. All these alternatives give the same service as the project activity.
- II. **Investment Analysis:**

The financial analysis has been conducted based on the levelised cost of power from a coal based plant vis-à-vis the WHRB based project activity

The EB RIT has suggested that, the economic comparison of the CDM project activity and a baseline scenario with same level of service, i.e. a 15 MW WHRB based power plant with a 15 MW coal based power plant at the same PLF should be made to establish the additionality of the project. The explanation for consideration of coal based power plant as the baseline scenario has been provided in the responses to the 'Request for Review' and is reproduced below:

As already described in Section B3 of the PDD, the project consists of one common turbine of actual 30 MW [but limited in generation capacity to 25 MW] for which steam is being supplied from the WHRBs and the AFBC through a common header. The variation of gas supply to the WHRB and its effect on the production of steam has been discussed earlier. The capacity of steam generation from WHRB is based on the best flow volume of waste flue gases and at the best available temperature. With a steady supply of waste gas, the WHRB will provide its full rated quantity of steam and therefore enthalpy to the steam turbine to produce 15 MW power. With full quantity of steam from the WHRBs and the AFBC, the power generation will be optimum, i.e. 25 MW (15MW due to enthalpy of the WHRBs and 10 MW due to the enthalpy of the AFBC). According to PP such conditions are expected frequently though intermittently. Therefore PP has planned to install turbines of total capacity of 25 MW to utilize full capacity of WHRB instead of the average capacity of 66% However since



the operation of WHRBs is fraught with several operational problems as already explained in the Validation Report, the PLF (or in other term the boiler capability for delivering its rated steam generation) has been analyzed and it has been concluded that the PLF can at best be about 66% on an average. This is also the reason why backup power is required. The PDD described about the dependence of grid power in Section A2, which is reproduced *“The generated power will firstly meet its present and future requirement of captive power. The balance back up or standby support power required to meet the fluctuating power generation from WHRB, would be drawn from WESCO which is the local grid and which is part of Eastern Regional Grid. In case of Surplus the unit will wheel the surplus power to the Grid”*.

As stated in the responses to the ‘Requests for Review’ and subsequent ‘Review’ of the project, we wish to once again reiterate that power generation from the WHRB based power plant would at be about 66% of the installed capacity. It has to therefore to be noted that a PLF is an annualised average PLF. So, it should not be presumed that the power generation would be at a constant PLF of 66% throughout the year. The balance power would be imported from the grid.

The import from the grid is conservative in terms of GHG emissions. This has already been factored in the cost of the levelised tariffs in the earlier explanation as well as the current version of the Validation Report.

This has already been explained in the Request for Review, which is reproduced below:

“Continuous / uninterrupted power supply is a very critical input for steel making process. Since the grid supply was proven to be inconsistent and unreliable, import of power from grid was not considered as a baseline alternative.”

Nevertheless, even if import of grid power is considered as a baseline alternative, it is observed that coal based power is cheaper than grid power. Refer the WESCO (Western Electricity Supply Company of Orissa Limited) power tariff schedule^{*}; it is clear that the power import cost from grid (considering only energy charges) was Rs. 3.00 per KWh Considering a minimum cost of 35 paise towards demand charges, the cost of importing power would be Rs. 3.35 per KWh. Both these costs are higher than the coal based power generation (Rs. 1.20 per KWh[†]).

It is also to be noted here that the power from the grid is most expensive option.

^{*} WESCO (Western Electricity Supply Company of Orissa Limited); Tariff at a glance (Appendix – 3).

[†] For Calculation of levelized cost refer the levelized cost E-01 working submitted along with the PDD.



Therefore the coal based power generation, being the cheapest alternative is accepted as the baseline scenario.

As seen the levelised cost of power from a WHRB based power plant (with supplementary grid support) at 95% works out to Rs 1853.18/Mwh, while the levelised cost of a similar coal based plant (which does not require any grid support) works out to Rs 1200.37/Mwh.

The CERs have been calculated based on the estimated quantity of steam / enthalpy provided for power production (estimated at 66% on an annualized basis) from WHRB alone which is conservative.

The sensitivity analysis also confirms that the levelised cost consistently remains higher than the baseline scenario. Even at an increased annualized PLF of 10%, the levelised cost will be Rs 1547.91 Rs./MWh which is still higher than the baseline project cost of Rs 1200.37/MWh (Coal Based Power Plant working at 95% PLF)

While assessing the investment comparison, validation team realized that the variables like coal cost, salary for manpower, the backup power charges, and PLF and capital cost of the project are the factors affecting the levelised cost considerably. Keeping this in mind, the validation team has validated the assumptions in the calculation of the above-mentioned levelised costs as follows

1. Project cost – Cost for WHRB was taken from the workings of similar plant and was used in the investment analysis. The cost of the 25 MW power plant as seen in the purchase orders was used for reference. Since the cost of an independent WHRB based power plant would be higher than such apportioned cost, this approach is conservative.
2. Capacity - As per actual installation and consent
3. Plant working days (350) – based on standard industrial practices [6 days a week] and general Indian scenario regarding paid leaves. Further, for the sake of uniformity in the number of operating days for investment comparison analysis, the PLF confirmed is adjusted to suit the working days as 350.
4. Plant load factor of 95% - Of this 66% will come from WHRBs and the rest would come from power imported from the grid. The validation team confirmed this assumption of 66% PLF for WHRB from the data of similar registered and verified CDM projects that are available on UNFCCC website (Reference Numbers: 515, 526, 556, 678, 696). The reported data indicates a typical PLF of 52% over 322 working days. At 350 working days, this PLF amounts to 56%, which is less than 66%. Hence the assumption of 66% over 350 days is accepted as conservative. The balance of power requirement will be drawn from the grid.
5. Auxiliary Consumption – as per the data provided the local electricity authority viz. Central Electricity Authority [CEA]
6. Manpower and hence Salary – The validation team insisted that the manpower actually employed should be allocated between the WHRB and



Coal part. The Project Participant suggested that this allocation should be based on the number and type of the equipment. This was a fair and workable suggestion and hence accepted by the validation team. Accordingly, the manpower was allocated considering 2 WHRB boilers, 1 AFBC boiler and 1 turbine as the main equipment. Separate manpower was assigned for coal handling and no equivalent manpower was assigned for WHRB [this is conservative]. The individual salaries prevalent at the time of taking the decision were used to calculate the total salary component. It is to be noted that the individual salary considered in the 2 alternatives under investment comparison were same.

7. Depreciation – as per Indian Companies Act.
8. Interest rate – As per the bank loan documents verified during site visit.
9. Back up power cost - Since the generation from the WHRB fluctuates considerably with the fluctuations in the quantity and quality of waste gases from sponge iron production, Project Participant is forced to keep an alternative arrangement as standby to meet any shortfalls on account of such fluctuations in the WHRB output. Such back-up is typically arranged by grid imports. The backup capacity should be sufficient to ensure uninterrupted operations even during complete failure of WHRB facility. After a lot of deliberation, the validation team agreed that provision for 50% of the capacity towards backup-power would be reasonable. In the current case this would mean that steam quantity equivalent to at least one WHRB is always available. Thus while this provision does not cater to the demand of the installed capacity in the complex, it can be expected to meet the demand from the critical equipment to run the process. Hence the validation team accepted this assumption. The charges for the backup power were confirmed from the actual bills of the Project Participant since Project Participant already has certain back-up power arrangement with the electricity supplier.
10. Repairs, Maintenance and Consumables – Considered as 3 % which is less than the CERC guidelines for IRR benchmark of 7.69% for the eastern region in 2003 – 04
11. Raw material cost – For Coal - as per the invoices. No cost considered towards waste gases.

The financial expert in the validation team verified the worksheets for levelised cost and observed that the calculations are based on good accounting principles and practice.

The details of computation of the estimated consumption are shown in Appendix C below. A separate Excel spreadsheet has also been attached with the PDD.

III. **Barrier Analysis:**

Project Participant has discussed the barrier analysis also. The validation team assessed the discussion. However, the barriers discussed by Project Participant were assessed for their prohibitive nature and the assessment summary is as follows:



a) **Investment Barriers:** Project Participant argued that there is no private capital available due to the risk involved due the fluctuating power generation from a sponge iron based WHRB power plant. Project Participant provided the validation team a letter from a bank stating this. Hence the validation team accepted it as a barrier.

b) **Technological Barriers:** Project Participant had discussed factors like iron ore and coal quality, performance of the sponge iron kiln effecting the power generation, low PLF due to variations in the Kiln performance, frequent shutdowns of the Kiln, high temperatures of flue gases due to no controls on exit temperatures of kiln does exists and found to be technological barriers. These factors ultimately affect the economic viability of the project and hence lead to investment analysis. This is already considered above as a part of computation of the levelised tariff. Project Participant has discussed further barriers such as like non-availability of skilled and trained labour, lack of infrastructure for implementation of the technology, etc. Though these are some of the existing prevailing issues, validation team opines, that this would not prevent the implementation of the project activity.

c) **Barriers due to prevailing practices:** In Orissa region the companies having WHRB based power plant have gone for CDM support indicating that WHRB based captive power plants are not the prevailing practice without CDM revenue. The validation team notes this as true. However this fact will not prevent implementation of the project, if it is economically attractive.

d) Operational and regulatory barriers discussed in the PDD are not considered prohibitive in nature by the validation team.

IV **Common practice analysis:**

The validation team has verified the information provided in the PDD by going through the JPC report as "Survey of Indian Sponge iron Industry 2005-06. It is confirmed that 16 units out of 147 units have captive power generation units. Out of these 16 units 8 are in Chattisgarh state and balance in the rest of India till 31 August 2005 establishes the fact that sponge iron units with captive power generation facility is not a common practice.

The above analysis through additionality tool suggests and therefore the validation team agrees that the project activity is not a likely baseline scenario and hence the emission reductions from the project are considered as additional.

Other discussions under step 4 were post project and hence not considered by the validation team.

Subsequently, during the validation process, the Tool for the demonstration and assessment of additionality was again revised and latest tool of Version 04 of EB 36 was used. The revised PDD with all necessary changes has been verified. CAR-3 is closed.



For CAR's and CL's, refer Appendix C (Validation protocol) for CAR's and CL's.

3.3 Monitoring Plan

The Project uses the Approved Consolidated Monitoring Methodology ACM 0004 – Version 02, March 03, 2006 (Consolidated monitoring methodology for waste gas and/or heat for power generation). Refer discussions on the validity of the methodology at section 3.2 above.

The adopted monitoring methodology has been chosen based on the following reasons:

1. Project activity generates 15 MWh electricity from waste heat, without adding any GHG emission.
2. The project activity displaces CO₂ emissions from the fossil fuel based Captive power plant and hence achieves reduction of CO₂ emissions.
3. There will be no fuel switch in rotary kiln that produces flue gases with waste heat after completion of project activity.

The roles and responsibilities of the monitoring personnel are clearly identified. It is also very clear as to what data needs to be monitored and the frequency. The monitoring plan also includes parameter of 'electricity exported to the grid' and 'electricity imported from the grid'. The retention period of the records is also clear.

Refer Appendix A (Validation protocol) for CAR's and CL's.

3.4 Calculation of GHG Emissions

As per ACM 0002, the baseline emission sources considered are coal based captive power plant for electricity generation.

As required under ACM 0002, the baseline emissions are calculated by electricity generation with fossil fuels (BEy) and project emissions (PEy). The detailed algorithms are described later under sections B.6.3 of the PDD. The validation team confirms that they are in line with the methodology.

As described in ACM 0004, the project emissions result due to auxiliary fuels fired for generation startup, in emergencies, or to provide additional heat gain before entering the Waste Heat Recovery Boiler. With reference to this methodology, project does not lead to any leakage, as there are no auxiliary fuels fired in the WHRB.

The emission factor of 1.26 indicated in the PDD was verified with enthalpy data available from steam tables and the specification sheets of boiler and turbine installed. The emission factor ex ante is calculated as per the calculation method accepted by UNFCCC Meth Panel vide AM – REV – 0033.

The estimated annual average of approximately **94,303** tCO₂e over the 10 year fixed crediting period of emission reduction represents a reasonable estimation using the assumptions given by the project.



For CAR's and CL's, refer Appendix A (Validation protocol).

3.5 Sustainable Development Impacts

The environmental impacts of the project have been reported in the PDD, Section D. The project activity is not expected to cause any significant environmental impacts. The environmental impacts of the project were sufficiently assessed by means of an Environmental Impact Assessment (EIA) Study. All the relevant permits for construction and operation were issued prior to the start of the construction work of the full-scale project.

Refer Appendix A (Validation protocol) for CAR's and CL's.

3.6 Comments by Local Stakeholders

Shyam DRI organized a stakeholder meeting with participants invited through advertisement in local daily newspaper Dhaitri, Bubhaneshwer on 22.08.2007. A meeting was held on 25.08.2007 at Village- Pandloi to make the villagers aware regarding the project activity i.e. regarding WHRB based electricity generation. A minute of meeting was prepared and the comments were summarized and recorded. The processes by which comments from local stakeholders have been invited and compiled, has been described within Section E of the PDD.

Another advertisement was put up in another local daily newspaper Samvad on 03/09/2007 informing about the CDM activities of the organisations.

The list of participants, notice-inviting participation to interested stakeholders, and photographic record of the stakeholder meeting proceedings is maintained by the project participants.



The stakeholders appreciated Shyam DRI WHR CPP project and asked for developmental work to be carried out by Shyam DRI. The project proponent provided the validation team during the site visit with a list of activities carried out in the nearby villages.

Some of activities carried out as per the list include

1. Provision of water ponds in villages Kalia Para, Amjharam, Ramchandranagar, Nishanbanga.
2. Bore wells with pump sets in villages Kalia Para, Charu para, Pandloi,
3. Street Light Poles in villages Kalia Para and Ramchandranagar
4. Community health check up programmes held in Villages Kalia Para, Babuchakli and Khunn Katarbagga.
5. Community education programme in schools of BabuChakli, Kalia Para Bausen, Pandloi and Nishanbanga.
6. A school bus is also been provided for Ramchandranagar High School

Overall, there was agreement that the project activity was a beneficial project from the local sustainable development. Furthermore, during the on site visit, representatives from the local community were interviewed. In general, the interviewees show adequate understanding of the nature of the project and agreed that the project would benefit the environment, society and economic development. The response is overall supportive.

For CAR's and CL's, refer Appendix A (Validation protocol) for CAR's and CL's.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the Validation of CDM projects, the DOE shall make publicly available the project design document and receive, within 30 days; comments from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available.

Bureau Veritas Certification published the project documents on the UNFCCC CDM website (<http://cdm.unfccc.int>) on 06/07/2007 and invited comments within 04/08/2007 by Parties, stakeholders and non-governmental organizations.

No comments were received.

5 VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the Shyam DRI WHR CPP Project in India. The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Project participant/s used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides analysis of investment, technological



and other barriers to determine that the project activity itself is not the baseline scenario.

By synthetic description of the project, the project is likely to result in reductions of GHG emissions partially. An analysis of the investment and technological barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The review of the project design documentation (Version 02) and the subsequent follow-up interviews has provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

The validation is based on the information made available to us and the engagement conditions detailed in this report.

6 REFERENCES

Category 1 Documents:

Documents provided by Shyam DRI Power Limited that relate directly to the GHG components of the project.

- /1/ Project Design Document Version 01, dated 23.06.2007 and subsequently revised. The Latest version of PDD is Version 03, dated 09.04.2008.
- /2/ Host country approval from the Ministry of Environment and Forests (MoEF) – DNA for India – Letter – 4/18/2007 – CCC dated 15th November 2007.
- /3/ Extract of the Board meeting minutes of Shyam DRI Power Limited, 10th January 2004 for CDM consideration.
- /4/ Purchase order for 2 nos of WHRBs SPDL /TSPL/02/09/04 dtd. 09/09/2004 placed on Thermal Systems Hyderabad.
- /5/ Supply contract agreement for 30 MW STG dated 10/11/2004 by Shyam DRI Power limited with M/s Hangzhou Steam Turbine Co. Limited, Peoples Republic of China and M/s Greenesol Power Systems, Bangalore
- /6/ Documents of Investment Analysis for the project activity.

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

- /1/ Communication regarding the stakeholder meeting – Paper advertisements in local language daily newspapers (Dhatri – 22.08.2007 and Samvad on 03/09/2007)
- /2/ Minutes of Meeting with villagers on the stakeholder meeting dated: 03 September 2007.
- /3/ NOC from local Gram panchayat.



- /4/ Kyoto Protocol to the United Nations Framework Convention on Climate Change, United Nations, 1997.
- /5/ APPROVED CONSOLIDATED METHODOLOGY ACM0004 – Version 02 – 03 March 2006
- /6/ Statement of the modalities for communication with the Executive Board and UNFCCC Secretariat dated 02 February 2008 from Shyam DRI Power Limited.
- /7/ List of social work carried out by Shyam DRI in the nearby villages in response to local stakeholder consultation process.

Persons interviewed:

List persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

- /1/ Mr. Sanjay Agrawal – Director – Shyam DRI Power Limited
- /2/ Mr. Navneet Garg – Shyam DRI Power Limited
- /3/ Mr. D K Trivedi - Shyam DRI Power Limited.
- /4/ Mr. Kiror Kumar Das – Shyam DRI Power Limited
- /5/ Mr. Gopal Borodia – Indus Technical and Financial Consultants Ltd.
- /6/ Mr. Vikas Thakur – Indus Technical and Financial Consultants Ltd.
- /7/ Mr. Santosh Naik – Ex Sarpanch, Village Pandloi (Local Stakeholder)
- /8/ Mr. Narottam Pradhan – Village Nishanbanga (Local Stakeholder)
- /9/ Mr. Avay Patel – Village Nishanbanga (Local Stakeholder)

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APPENDIX A:

VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	See Table 2, Section A.3.3.	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	The Project Proponent has obtained Host Country Approval (India).	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	See Table 2, Section A.3.3.	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved, including confirmation by the host party that the project activity assists it in achieving sustainable development	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a, §28, Annex 3 of the Resolução Interministerial	Project proponent has received Host country approval (India) from the Ministry of Environment and Forests that is the DNA for India.	Written approval of voluntary participation from the DNA is obtained. Ref: Letter 4/18/2007 –CCC dated 15 th November 2007.



VALIDATION REPORT

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	01/03		
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	See Table 2, Section A.5.4.2	Table 2, Section A
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43 and 44	Yes. See Table 2, B.2.1.	Table 2, Section B.2
7. Potential public funding for the project from Parties in Annex shall not be a diversion of official development assistance	Marrakech Accords	The Project will not receive any public funding from parties included in Annex I	Declaration by the Project Proponent in Annex. 2 of PDD.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	Ministry of Environment and Forest (MOEF) is the Designated National Authority (DNA) of India	Govt of India has designated the National Clean Development Mechanism (CDM) Authority under MoEF to act as DNA. Source http://cdm.unfccc.int/DNA
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	Yes.	Host country, India is a party to the Kyoto Protocol
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	Yes, See Table 2, Section H.1 to H.5 and Appendix B of Validation Report.	Table 2, Section H



VALIDATION REPORT

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	See Table 2, Section G.1.	Table 2, Section G
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	See Table 2, Section B.1.1 and D.1.1.	Table 2, Section B.1 and Section D.
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	See table 2, Section D.	Table 2, Section D
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	Project Design Document (PDD) was made publicly available on UNFCCC Website for the period of 30 days from 06 July 2007 to 04 Aug 2007.	Source http://cdm.unfccc.int/Projects/Validation
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or Sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45 b, c, e	Yes, See table 3.	Table 3.
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	Yes, See table 3.	Table 3.
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format and fulfilled according to the guidelines for completing CDM-PDD, CDM-NMB, and CDM-NMM	Marrakech Accords, CDM Modalities, Appendix B, EB	The Project Design Document meets the UNFCCC requirements.	PDD Version 03.1 is used.



VALIDATION REPORT

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Decisions		

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
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VALIDATION REPORT

A. General Description of Project Activity <i>The project design is assessed.</i>						
A.1.	Title of the project activity, version number and date of the document	1	DR	SHYAM DRI WHR CPP Version no. 2 Date of the document-19 Feb 2007	OK	OK
A.2. Description of the project activity						
A.2.1.	Is the purpose of the project activity included?	1	DR	Yes, it is adequately described in the PDD, "to generate electricity by generating steam using waste heat contained in the waste flue gases released from 2 numbers of ABC (After Burning Chamber) from two numbers of DRI (Direct Reduced Iron) sponge iron kiln having 350 TPD X 2 Nos. The heat contained in waste gases will be transferred to water which converts water in to steam in two numbers of WHRBs (Waste Heat Recovery Boilers 38 tph each) producing aggregate 76 tph steam at 66 kg/cm ² pressure and 490±50C temperature to generate total 15 MW electricity from Waste Heat. The power so generated shall mainly be used to meet the captive power requirement of Shyam DRI Plant itself.	OK	OK



VALIDATION REPORT

A.2.2.	Is the view of the project participants on the contribution of the project activity to sustainable development included?	1	DR	Yes, the project activity will lead to sustainable development and promote sustainable Industrial growth by conserving natural resources and preventing the thermal pollution even though no such statutory requirement exists. The other sustainable benefits are: <ul style="list-style-type: none"> • Social benefit to State • Economical Benefits to State • Environmental Benefit • Reduction of T & D Losses of Power • Reduction in SPM level in the Atmosphere • Other additional Economic benefits. 	OK	OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>						
A.3.1.	Is the project in line with relevant legislation and plans in the host country?	-	DR I	Indian legislation allows use of waste heat for generation of electricity.	OK	OK
A.3.2.	Is the project in line with host-country specific CDM requirements?	-	DR I	Host Country approval for the project is not available	CAR 1	OK
A.3.3.	Is the project in line with sustainable development policies of the host country?	-	DR I	Refer to A.3.2	-	OK
A.3.4.	Will the project create other environmental or social benefits than GHG emission reductions?	-	DR I	The project is reported to lead to sustainable development and the economical and technological benefits like reduction in SPM level and thermal pollution.	OK	OK



VALIDATION REPORT

A.4. Project participants					
A.4.1. Are Party (ies) and private and/or public entities involved in the project activity listed?	1	DR	Yes, SHYAM DRI Power Ltd.-is a project participant.	OK	OK
A.4.2. Is the contact information provided in annex 1 of the PDD?	1	DR	Yes, Mr. Sanjay Agrawal, Director (Administration) is the contact person.	OK	OK
A.4.3. Is this information indicated using the tabular format?	1	DR	The project participant information is indicated using the tabular format of the Annex 1 of the PDD.	OK	OK
A.5. Technical description of the project activity					
A.5.1. Location of the project activity					
A.5.1.1. Host country Party(ies)	1	DR	India.	OK	OK
A.5.1.2. Region/State/Province etc.	1	DR	Sambalpur District, Orissa State	OK	OK
A.5.1.3. City/Town/Community etc.	1	DR	Village:Pandloi & Nishanbanga, P.O. Lapanga/Rengali,	OK	OK
A.5.1.4. Detailed description of the physical location, including information allowing the unique identification of this project activity.	1	DR	The company is located at Village:Pandloi & Nishanbanga P.O. Lapanga/Rengali, Sambalpur District, Orrisa State at Plot No. & Chaka No. 981/1293, 949/1295, 1231/1349, 986, 1001/1382 & 1231/1383 and Khatiar SI.No.116/192 of PS-Karabaga, about 35 KM from Sambalpur Railway Station on State Highway No.10. Longitude= E 84° 2'35" Latitude=N 21° 40'50"	OK	OK
A.5.2. Category of the project activity					
A.5.2.1. Is the category of the project activity specified?	1	DR	Category 1, Energy Industries (renewable / non renewable sources).	OK	OK
A.5.2.2. Is it justified how the proposed project activity conforms to the project category selected?	-	DR	The proposed project activity being a power generation activity using waste heat energy conforms to the category selected.	OK	OK



VALIDATION REPORT

A.5.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.5.3.1. Does the project design engineering reflect current good practices?	-	DR I	Section A 4.3 indicates installation ESPs, DM plant, Instrument air compressors as well as exhaust steam condensor which reflect good engineering practices	OK	OK
A.5.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	-	DR I	The currently available best technology has been adopted to ensure optimum performance of the project.	OK	OK
A.5.3.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	-	DR I	The project has adopted a well established and proven technology and is not likely to be replaced during this project life time	OK	OK
A.5.3.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	-	DR I	PDD is silent about the initial training and maintenance requirements.	CL 1	OK
A.5.3.5. Does the project make provisions for meeting training and maintenance needs?	-	DR I	PDD is silent about the provisions for meeting training and maintenance requirements, though it indicates training will be imparted as per training schedule	CL 2	OK



VALIDATION REPORT

A.5.4. Brief statement of how anthropogenic emissions of GHG by sources are to be reduced by the proposed CDM project activity					
A.5.4.1. Is it stated how anthropogenic GHG emission reductions are to be achieved?	1	DR	Sensible heat of Waste gas is utilized which would have otherwise been released through the stack. In absence of the proposed project activity the unit would meet the captive electricity requirement by generating power from coal based captive power plant and at the same time the waste heat contained in the flue gases would have been emitted to the atmosphere.	OK	OK
A.5.4.2. Is the estimate of total anticipated reductions of tons of CO2 equivalent provided?	1	DR	Estimated annual emission reductions over the 10-year fixed crediting period would be 43526 tCO _{2e} . Basis for the emission factor needs to be established.	CAR 2	OK
A.5.4.3. Is this information indicated using the tabular format?	1	DR	The information is not provided exactly as per the tabular format in section A 4.4. - Last three rows [Total estimated reductions (tonnes of CO ₂ e) Total number of crediting years Annual average over the crediting period of estimated reductions (tonnes of CO ₂ e)]	CL 3	OK
A.5.5. Public funding of the project activity					
A.5.5.1. Is it indicated whether public funding from Parties included in Annex I is involved in the proposed project activity?	1	DR	As per A.4.5 of PDD, no public funding from parties included in Annex-I is available for the project activity.	OK	OK



VALIDATION REPORT

A.5.5.2. If public funding is involved, is information on sources of public funding for the project activity provided in Annex 2, including an affirmation that such funding does not result on a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties?	1	DR	Not applicable. Refer A.5.5.1.	OK	OK
B. Project Baseline					
<i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology					
<i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	1 UNF CCC web site	DR I	Yes. Consolidated baseline methodology for waste gas and/or heat for power generation	OK	OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?			The approved methodology is applicable to project activity that generates electricity from waste heat or the combustion of waste gases in industrial facility. The baseline methodology is considered applicable and justified.	OK	OK



VALIDATION REPORT

B.1.3. Are the title and the reference of the baseline methodology applicable to the project activity defined?			Yes. The baseline methodology applicable is Consolidated baseline methodology for waste gas and / or heat and / or pressure for power generation. ACM 0004, Version 02 (3 rd March 2006).	OK	OK
B.1.4. Does the project activity generates electricity from a waste heat or the combustion of waste gases in an industrial facility?			The project activity generates electricity from waste heat.	OK	OK
B.1.5. Does the project activity displace electricity generation with fossil fuels?			Yes. The project activity will displace equivalent to power from coal based captive power plant of the company.	OK	OK
B.1.6. Is fuel switch done in the process?			WHR process does not have provision for fuel switch.	OK	OK
B.2. Description of how the anthropogenic GHG emissions by sources are reduced below those that would have occurred in the absence of the proposed project activity					
B.2.1. Is the proposed project activity additional?	1	DR	Additionality justification in Section B 5 of PDD has not used the latest additionality tool. (Ver 3)	CAR 3	OK
B.2.2. Was the additionality of the project activity demonstrated and assessed using the latest version of the "Tool for demonstration and assessment of additionality"?			Refer B.2.1 of Check list.	CAR 3	OK
B.2.3. Please comment on adequacy of application and tool and specifically describe deficiencies and shortcomings			Refer B.2.1 of checklist.	CAR 3	OK



VALIDATION REPORT

B.2.4. Do the baseline scenario alternatives include all options that provide or produce electricity for in-house consumption and/or sale to grid and/or other consumers?		DR I	Base line scenarios are described in detail in section B.4 of PDD as required by ACM 0004 Ver 2.	OK	OK
B.2.5. Did the project participant provide evidence and supporting documents to exclude baseline options that do not comply with legal and regulatory requirements; or depend on key resources such as fuels, materials or technology that are not available at the project site?		DR I	Yes, the Baseline options presented in PDD are – 1. Project not undertaken as a CDM activity. 2. Import of electricity from grid. 3. New CPP based on Diesel oil as alternative fuels. 4. New CPP based on Gas alternative fuels. 5. New CPP based on Coal as other alternative fuels. 6. A combination of 2,3,4 and 5. 7. Alternative use of waste heat from flue gases. 8. The continuation of the current situation. All the options indicated are allowed by regulatory provisions in the host country.	OK	OK
B.2.6. Are national policies and circumstances relevant to the baseline of the proposed project activity summarised?	-	DR I	The national policy on environment and energy conservation is addressed adequately in the PDD.	OK	OK
B.3. Description of the project boundary for the project activity					
B.3.1. Does the GHG emissions of the project activity, include:					
B.3.1.1. CO2 emissions from combustion from auxiliary fossil fuels			Not applicable	OK	OK
B.3.1.2. CO2 emissions from fossil fuel fired power plants connected to the electricity system;			Not applicable.	OK	OK
B.3.1.3. CO2 emissions from fossil fuel fired captive power plants supplying the project site facility			Not applicable.	OK	OK



VALIDATION REPORT

B.3.1.4. Are the project's spatial (geographical) boundaries clearly defined?		DR	The spatial extent of the project boundary does not cover the sources of the waste gases and ABCs are not included.	CAR 4	OK
B.3.2. Are emissions sources included in or excluded from the project boundary in accordance with Table 1		DR I	Yes. Refer B.3 of PDD.	OK	OK
B.4. Details of the baseline and its development					
B.4.1. Is the date of completion provided?	1	DR	Yes, The date of completion is indicated as 23 June 2007	OK	OK
B.4.2. Is contact information provided?	1	DR	Yes.	OK	OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1	DR	The project start date is mentioned as 15 th January 2004. Operational lifetime is 15 years. However, the PDD section C 1.1 is not as per dd/mm/yyyy format.	CAR 5	OK
C.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	1	DR	Fixed crediting period of 10 years has been chosen	OK	OK



VALIDATION REPORT

D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1.	Is the monitoring methodology previously approved by the CDM Methodology Panel?	1	DR	The approved monitoring methodology ACM 0004 called "Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation" has been used.	OK OK
D.1.2.	Is the monitoring methodology applicable for this project and is the appropriateness justified?	1	DR	The reasons for choosing this monitoring methodology are appropriately justified in the item B.7 of the PDD.	OK OK
D.1.3.	Does the monitoring methodology reflect good monitoring and reporting practices?	-	DR	Yes, they have been explained in B.7.2 of PDD and as well as in Annexure 4. 1. The terms used in the calculation are not clear. What is "F1,2...", and F1,F2,F3 and F4 are not properly indicated in the schematic drawing.	CAR 6 OK
D.1.4.	Is the discussion and selection of the monitoring methodology transparent	2	DR I	Yes	OK OK
D.1.5.	Is fuel switch done in the process?	2	DR I	Refer B.1.5.	OK OK
D.1.6.	Does the project activity generate electricity from waste heat or the combustion of waste gases in an industrial facility?	2	DR I	Refer B.1.4.	OK OK



VALIDATION REPORT

E. Is the discussion and selection of the monitoring methodology transparent?					
E.1. Monitoring of Project Emissions					
8. It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
E.1.1. Are the project emissions determined according to the formula $PE_y = \sum Q_i \times NCV_i \times EF_i \times 44/12 \times OXID_i$?	2	DR	Project emissions are not applicable as no auxiliary fuel is used for start-up or in emergency.	OK	OK
E.1.2. Does the value for oxidation factor comes from a reliable source?	2	DR	Not applicable.	OK	OK
E.1.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	-	DR	As per PDD, the auxiliary fuels are not used for generation start up, in emergencies, or to provide additional heat gains before entering the waste heat recovery boilers.	OK	OK
E.1.4. Are the choices of project GHG indicators reasonable?	-	DR	Refer E.1.3.	-	-
E.1.5. Will it be possible to monitor / measure the specified project GHG indicators?	-	DR	Refer E.1.3.	-	-
E.1.6. Will the indicators give opportunity for real measurements of achieved emission reductions?	-	DR	Refer E.1.3.	-	-
E.1.7. Will the indicators enable comparison of project data and performance over time?	-	DR	Refer E.1.3.	-	-



VALIDATION REPORT

E.2. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
E.2.1.	Although leakages are not to be considered as per the methodology, are there any possibilities of leakage	-	DR	No, presently there is no possibility of leakage. To be verified during site visit.	CL 4 OK
E.2.2.	Does a monitoring mechanism exist for measurement and computation of leakages?	-	DR	Refer E.2.1 of check list.	-
E.3. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
E.3.1.	Did the baseline emissions were determined according to the formula $BE_{electricity, y} = EG_y \times EF_{electricity, y}$?		DR	Yes. Base line emissions are determined according to the sited formula.	OK OK
E.3.2.	Which option has been selected (Option 1(Captive Power), 2(Grid Imports) or 3 (Captive Power and Grid Imports).			Option 1 – Captive Power.	- OK
E.3.3.	Is the calculation based on the formulae related to the selected Option?			Yes, the formula for calculation is: $EF_{captive, y} = EF_{CO2, i} / EF_{f\text{ captive}} \times 44/12 \times 3.6$ TJ/1000 MWh	OK OK
E.3.4.	Were the Emissions Factor for displaced electricity calculated as in ACM0002?			Refer E.3.3 of check list	- OK
E.3.5.	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	-	DR	Yes, it is described in B.7of PDD. However, the retention period of the records has not been specified.	CAR 7 OK



VALIDATION REPORT

E.3.6.	Is the choice of baseline indicators, in particular for baseline emissions, reasonable?		Yes.	OK	OK
E.3.7.	Will it be possible to monitor the specified baseline indicators?		Yes, it is described in B.7 of PDD.	OK	OK



VALIDATION REPORT

E.4. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
E.4.1. Is the authority and responsibility of project management clearly described?	1	DR I	General Manager / DGM will be in-charge of all CDM related matters.	OK	OK
E.4.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1	DR	Yes, it is described in B.7.2 of PDD.	OK	OK
E.4.3. Are procedures identified for training of monitoring personnel?	-	I	Procedures are not clearly identified for training of monitoring personnel.	CL 5	OK
E.4.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	-	I	Yes, it is described in Annexure 4, Table for monitoring point no: 6.2.	OK	OK
E.4.5. Are procedures identified for calibration of monitoring equipment?	-	I	Yes, it is described in Annexure 4, Table for monitoring point no: 3.0.	OK	OK
E.4.6. Are procedures identified for maintenance of monitoring equipment and installations?	-	I	Though some reference is given for maintenance manual in Annexure 4, table for monitoring. It is does not elaborate on this issue.	CL 6	OK
E.4.7. Are procedures identified for monitoring, measurements and reporting?	-	I	Yes, they are described in Annexure 4, Table for monitoring.	OK	OK
E.4.8. Did all measurements use calibrated measurement equipment that is regularly and checked for it's functioning?			Yes, it is described in Annexure 4, Table for monitoring point no: 3.0.	OK	OK



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E.4.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	-	I	Yes, it is described in Annexure 4, Table for monitoring point no: 4.0.	OK	OK
E.4.10. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	-	I	Though a point of uncertainties and adjustments is mentioned in Annexure 4, Table for monitoring point no: 5.0, there is no mention of data adjustments and uncertainties.	CAR 8	OK
E.4.11. Are procedures identified for review of reported results/data?	-	I	Yes, it is described in Annexure 4	OK	OK
E.4.12. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	-	I	Procedure for internal audits of GHG Project compliance needs to be clearly identified.	CL 7	OK
E.4.13. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	-	I	Though General Manager / Vice President is responsible for summarizing data of Electrical, Mechanical, Process (Operations) departments and report the same to the Vice President (Power), procedure for project performance review needs to be clearly defined.	CL 8	OK
E.4.14. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	-	I	Procedure for corrective actions for accurate future monitoring and reporting needs to be clearly identified.	CL 9	OK
F. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					



VALIDATION REPORT

F.1. Predicted Project GHG Emissions <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
F.1.1. Is the calculation of the electricity generated in units supplied by waste gas and other fuels in line with the methodology (Refer Formulae 5 and 6)			Gross generation of 83610 MWh (with 66% PLF of 126000 MWh) is calculated. Refer PDD, it says about metering of auxiliary power consumption. How 10% auxiliary consumption is predicted is not clear.	CL 10	OK
F.1.2. Are all aspects related to direct and indirect GHG emissions, including leakage, captured in the project design?	-	DR	As per the approved methodology, since use of auxiliary fuels is not there, the project emissions are to be considered as nil.	OK	OK
F.1.3. Are the GHG calculations documented in a complete and transparent manner?	-	DR	Though the calculations of power generations gross and net are there, the basis of taking emission factor, as is not there.	CAR 2	OK
F.1.4. Have conservative assumptions been used to calculate project GHG emissions?	-	DR	Refer F.1.2 of check list.	-	
F.1.5. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	-	DR	Refer F.1.2 of check list.	-	
F.1.6. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	-	DR	Refer F.1.2 of check list.	-	
F.2. Baseline Emissions <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
F.2.1. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	-	DR	The baseline boundaries are clearly defined. It mentions coal based captive power generation.	OK	OK



VALIDATION REPORT

F.2.2. Are the GHG calculations documented in a complete and transparent manner?	-	DR	Refer F.1.3 of check list	-	
F.2.3. Have conservative assumptions been used when calculating baseline emissions?	-	DR	Refer F.1.3 of check list	-	
F.2.4. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	-	DR	Refer F.1.3 of check list	-	
F.2.5. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	-	DR	Refer F.1.3 of check list	-	
G. Environmental and Social Impacts <i>Documentation on the analysis of the environmental and social impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
G.1. Has an analysis of the environmental and social impacts of the project activity been sufficiently described?	PDD	I	Section D.1 of the PDD details the analysis of environmental impacts of the project activity. However, what are the social impacts is not clear.	CL 11	OK
G.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	-	I	There are no legal requirements for EIA study. However the organisation has environment clearances from the state pollution control board	I. OK	OK
G.3. Will the project create any adverse environmental or social effects?	-	I	There will be no adverse environmental impacts. However, social effects are not clear.	CL 12	OK
G.4. Are transboundary environmental and social impacts considered in the analysis?	-	I	Refer G.1.	-	
G.5. Have identified environmental and social impacts been addressed in the project design?	-	I	Refer G.1.	-	



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G.6.	Does the project comply with environmental legislation in the host country?	-	I	Yes, it complies with the environmental legislation of India	OK	OK
G.7.	Is the project activity environmentally licensed by the competent authority?			Yes, Necessary clearances from the pollution control board have been obtained by the organisation. It was verified during the site visit	OK	OK
G.8.	Are the conditions of the environmental license being met?			Yes, verified during the site visit	OK	OK
G.9.	Are the conditions of the Designated National Authority being met?			Yes. Verified during site visit.	OK	OK
H. Stakeholder Comments <i>The Validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>						
H.1.	Have relevant stakeholders been consulted?	-	DR	Shyam dri identified certain persons as stakeholders (1.Local authority of Village –Pandloi Gram Panchayat 2) Western Electricity Supply Company of Orissa Ltd (WESCO) 3) State Pollution Control Board, Orissa (OSPCB) 4) Ministry of Commerce and Industry.). However, how and when the views of interested parties like villagers are taken is to be verified	CL 13	Ok
H.2.	Have local stakeholders used appropriate media to invite comments?	-	DR	Refer H.1 of check list.	-	OK
H.3.	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	-	I	Project activity does not fall under the category of projects requiring Stakeholder consultation Process by law.	OK	OK
H.4.	Is a summary of the stakeholder comments received provided?	-	DR	Summary of the stakeholders received is provided in PDD. However refer H.1.	-	OK



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H.5. Has due account been taken of any stakeholder comments received?	-	DR	Table in item E.3 of the PDD describes how the stakeholder comments have been addressed. No adverse comments have been received hence requirements of taking due account of any stakeholder comments is not applicable.	OK	OK
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Table 3 Baseline and Monitoring Methodologies ACM0004 version 2 dated 03/03/2006

CHECKLIST QUESTION	Ref.	Move *	COMMENTS	Draft Concl	Final Concl
1. Baseline Methodology					
1. 1. Applicability					
1.1.1. Does the project activity generate electricity from waste heat or the combustion of waste gases in an industrial facility?	2	DR I	Yes.	OK	OK
1.1.2. Does the project activity displace electricity generation with fossil fuels?	2	DR I	Yes, project activity displaces electricity generated by coal based captive power plant.	OK	OK
1.1.3. Is fuel switch done in the process?	2	DR I	No.	OK	OK
1. 2. Project boundary					
1.2.1. Did the project participant include the CO ₂ emissions from combustion from auxiliary fossil fuels?	2	DR	No auxiliary fuel is used for start-up or in emergency.	OK	OK
1.2.2. Did the project participant include the CO ₂ emissions from fossil fuel fired power plants connected to the electricity system or captive power plants supplying the project site facility?	2	DR	Not applicable	OK	OK
1.2.3. Does the spatial extent of the project	2	DR	No, the spatial extent of project boundary does not	CAR 4	OK



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CHECKLIST QUESTION	Ref.	Move *	COMMENTS	Draft Concl	Final Concl
boundary comprises the waste heat or gas sources, captive power generating equipment, any equipment used to provide auxiliary heat to the waste heat recovery process, and the power plants connected physically to the electricity grid that the proposed project activity will affect?			include source of waste heat. Refer B.3.1.4.		
1.3. Identification of alternative baseline scenarios					
1.3.1. Do the baseline scenario alternatives include all possible options that provide or produce electricity for in-house consumption and/or sale to grid and/or other consumers?	2	DR	Yes. Base line scenarios are described in detail in section B.4 of PDD.	OK	Ok
1.3.2. Did the project participant provide evidence and supporting documents to exclude baseline options that do not comply with legal and regulatory requirements; or depend on key resources such as fuels, materials or technology that are not available at the project site?	2	I	Baseline options presented in PDD are – 1. Project not undertaken as a CDM activity. 2. Import of electricity from grid. 3. New CPP based on Diesel oil as alternative fuels. 4. New CPP based on Gas alternative fuels. 5. New CPP based on Coal as other alternative fuels. 6. A combination of 2, 3, 4 and 5. 7. Alternative use of waste heat from flue gases. 8. The continuation of the current situation. All the options indicated are allowed by regulatory provisions in the host country.	OK	Ok
1.4. Additionality					
1.4.1. Was the additionality of the project activity demonstrated and assessed using the latest version of the “Tool for demonstration and assessment of additionality”?	2	DR	Additionality justification in Section B 5 of PDD has not used the latest additionality tool. (Ver 3)	CAR 3	OK



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CHECKLIST QUESTION	Ref.	Move *	COMMENTS	Draft Concl	Final Concl
1.5 Project Emissions					
1.5.1. Are the project emissions determined according to the formula $PE_y = \sum Q_i \times NCV_i \times EF_i \times 44/12 \times OXID_i$?	2	DR	Project emissions are not applicable as no auxiliary fuel is used for start-up or in emergency.	OK	OK
1.5.2. Does the value for oxidation factor come from a reliable source?	2	DR	Yes. IPCC guidelines have been referred.	OK	OK
1.6. Baseline Emissions					
19. 1.6.1. Did the baseline emissions were determined according to the formula $BE_{electricity, y} = EG_y \times EF_{electricity, y}$?	2	DR	Yes, Base line emissions are determined according to the sited formula.	OK	OK
20. 1.6.2. Were the Emissions Factor for displaced electricity calculated as in ACM0002?	2	DR	Yes, emission factor is calculated as indicated in ACM 0002.	OK	OK
1.7. Leakage					
1.7.1. Are the leakage emissions determined?	2	DR	Not applicable.	OK	OK
1.8. Emission Reduction					
1.8.1. Are the emission reductions determined according to the formula $ER_y = BE_y - PE_y$?	2	DR	Yes.	OK	OK
1.8.2. Were all values chosen in a conservative manner and was the choice justified?	2	DR I	Yes.	OK	OK
2. Monitoring Methodology					
2.1. Applicability					
2.1.1. Does the project activity displace electricity generation with fossil fuels?	2	DR I	Yes by utilizing the waste heat the electricity is generated. Fossil fuel based electricity generation is justified to be base line scenario.	OK	OK
2.1.2. Is fuel switch done in the process?	2	DR I	No.	OK	OK
2.1.3. Does the project activity generate electricity	2	DR	Yes.	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	Move *	COMMENTS	Draft Concl	Final Concl
from waste heat or the combustion of waste gases in an industrial facility?		I			
2.2. Monitoring Methodology					
2.2.1. Does the methodology require monitoring of net electricity generation from the proposed project activity?	2	DR	Yes.	OK	OK
2.2.2. Does the methodology require monitoring of data needed to calculate carbon dioxide emissions from fossil fuel consumption due to the project activity?	2	DR	Not Applicable.	OK	OK
2.2.3. Does the methodology require monitoring of data needed to calculate the emission factor of captive power generation?	2	DR	Yes.	OK	OK
2.3. Quality Control (QC) and Quality Assurance (QA) Procedures					
Did all measurements use calibrated measurement equipment that is maintained regularly and checked for its functioning?	2	DR	Regular calibration of meters is mentioned.	OK	OK

Table 4 Legal Requirements

CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
1. Legal requirements					
1.1. Is the project activity environmentally licensed by the competent authority?	2	DR	To be verified during site visit.	CL 14	OK
1.2. Are the conditions of the environmental license being met?	2	DR	To be verified during site visit.	CL 15	OK
1.3 Are the conditions of the Designated National Authority being met?	2	DR	Verified during the site visit	OK	OK

**Table 5 Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2/3 /4	Summary of project owner response	Validation team conclusion
CAR 1 Host Country approval for the project is not available	A 3.2	Host country approval is obtained & enclosed vide Letter No.4/18/2007-CCC Dtd. 15.11.2007	Verified and found to be in order. Hence this CAR is closed.
CAR 2 Basis of taking emission factor, as is not there.	A 5.4.2 F.1.3	The baseline determined is coal based captive power plant. The base line calculations for CO ₂ emission reduction are in line with approved methodology and data drawn from IPCC and 15 MW turbine specification of manufacturer. Coal based AFBC captive power plant efficiency is conservatively calculated after considering boiler efficiency as 100% in line with Option- B of methodology.	The emission factor calculations as per the approved methodology and AM – Rev - 033 – revision approved by the Meth panel. Hence the CAR is closed
CAR 3 Additionality justification in Section B 5 of PDD has not used the latest additionality tool. (Ver 3)	B.2.1, B 2.2, B 2.3, Table 3 1.4.1	Additionality tool version04 has been used in the revised PDD	The revised PDD includes the latest additionality tool. Hence the CAR is closed
CAR 4 The spatial extent of the project boundary does not cover the sources of the waste gases and ABCs are not included.	B 3.1.4, B 1.2.3	The spatial extent of the project boundary has been revised in the revised PDD, which covers the sources of the waste gases, and ABCs are included.	The revised PDD indicates these and hence the CAR is closed.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2/3	Summary of project owner response	Validation team conclusion
CAR 5 The project start date is mentioned as 02 nd August 2003. Operational lifetime is 15 years. However, the PDD section C 1.1 and C 2.2.1 are not as per dd/mm/yyyy format.	C.1.	Project start date mentioned has been revised in the revised PDD as per dd/mm/yyyy format	The revised PDD indicates the dates in dd/mm/yyyy format. Hence the CAR is closed
CAR 6 The terms used in the calculation are not clear. What is "F1,2...", and F1,F2,F3 and F4 are not properly indicated in the schematic drawing..	D.1.3.	"F1,2...", and F1,F2,F3 and F4 have been properly indicated in the schematic drawing in the revised PDD. "F" is used to indicate the mass flow of steam quantity	PDD is revised. Hence the CAR is closed
CAR 7 The retention period of the records has not been specified. in B.7of PDD	E.3.5.	This point is taken care and we have mentioned in PDD that all the data are to be kept for crediting period + 2 years	PDD is revised. Hence the CAR is closed
CAR 8 Though a point of uncertainties and adjustments is mentioned in Annexure 4, Table for monitoring point no: 5.0, there is no mention of data adjustments and uncertainties.	E.4.10	All the data are measured, the meters are regularly calibrated, hence there is very little chance for uncertainty, In case of any uncertainty the most conservative approach will be adopted.	PDD is revised. Hence the CAR is closed
CL-1 PDD is silent about the initial training and maintenance requirements	A.5.3.4	The operation of power plant needs initial training without which it is not possible to operate power plant, hence SHYAM DRI recruits initially trained and experienced people, the new one's will be trained by experienced and trained senior staff by way of on-job training and specific training if needed.	Verified during the site visit and the operating personnel with exposure to power plant operation and maintenance are being recruited and no initial training is necessary and hence the CL is closed



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2/3	Summary of project owner response	Validation team conclusion
<p>CL 2</p> <p>PDD is silent about the provisions for meeting training and maintenance requirements, though it indicates training will be imparted as per training schedule</p>	A.5.3.5	<p>Time to time meeting and training will be imparted for requirement of maintenance and operation of WHRB power plant, manufacturer's specification is referred for proper maintenance.</p> <p>For all equipments maintenance is done as per maintenance manual that is very much important for running the plant smoothly, hence this takes cares of the maintenance manual.</p>	<p>Verified the maintenance manual which ahs provision for training. Hence the CL is closed.</p>
<p>CL 3</p> <p>The information is not provided exactly as per the tabular format in section A 4.4. - Last three rows</p> <p>[Total estimated reductions (tonnes of CO2 e)</p> <p>Total number of crediting years</p> <p>Annual average over the crediting period of estimated reductions (tonnes of CO2 e)]</p>	A 5.4.3	Table has been revised, in the revised PDD	PDD is revised. Hence the CL is closed
<p>CL 4</p> <p>Possibility of leakage to be verified during site visit.</p>	E 2.1	No possibility of leakage is there as there is no fuel fired in ABC or in WHRB.	<p>During the site visit it was verified and observed that there are no possibility for fossil fuel firing in WHRBs. Hence the CL is closed.</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2/3	Summary of project owner response	Validation team conclusion
CL 5 Procedures are not clearly identified for training of monitoring personnel	E 4.3	All the monitoring is done in the guidance of trained persons like Engineers and trained persons.	Verified during the site visit and the operating personnel with exposure to power plant operation and maintenance are being recruited and no initial training is necessary and hence the CL is closed
CL 6 Though some reference is given for maintenance manual in Annexure 4, table for monitoring. It is does not elaborate on this issue.	E4.6	For all equipments maintenance is done as per maintenance manual, which is very much important for running the plant smoothly, hence this takes cares of the maintenance manual.	Verified the maintenance manual which ahs provision for training. Hence the CL is closed.
CL 7 Procedure for internal audits of GHG Project compliance needs to be clearly identified.	E 4.12	Senior Officials of SHYAM DRI will carry out the internal audit of data maintenance; in this process project developer will also be involved in internal auditing.	PDD is revised. Hence the CL is closed
CL 8 Though General Manager / Vice President is responsible for summarizing data of Electrical, Mechanical, Process (Operations) departments and report the same to the Vice President (Power), procedure for project performance review needs to be clearly defined.	E 4.13	It is decided to do performance review for CDM every year by Management along with the Project Developer.	PDD is revised. Hence the CL is closed
CL 9 Procedure for corrective actions for accurate future monitoring and reporting needs to be clearly identified.	E 4.14	Vice president Plant is responsible for corrective actions and accuracy of monitoring and reporting.	PDD is revised. Hence the CL is closed



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2/3	Summary of project owner response	Validation team conclusion
<p>CL 10 Gross generation of 83610 MWh (with 66% PLF of 126000 MWh) is calculated. Refer PDD, it says about metering of auxiliary power consumption. How 10% auxiliary consumption is predicted is not clear.</p>	F 1.1	<p>Auxiliary power is estimated based on various equipments required to operate the power plant such as Boiler Feed Pump, Cooling Tower Fans, etc.. This percentage is considered as per past experiences by the similar plant operators, as well as known load chart of the auxiliary equipments, and also as per normal practice. However actual consumption figures will be considered during monitoring</p>	This CL is resolved and closed
<p>CL 11 Section D.1 of the PDD details the analysis of environmental impacts of the project activity. However, what are the social impacts is not clear</p>	G 1	<p>Installation of WHRB power plant creates new opportunity of employment directly and indirectly in society. It also replaces the coal based power generation that can otherwise generate GHG emission, and create fly ash nuisance, hence society is beneficated through this project either directly or indirectly.</p>	This CL is resolved and closed
<p>CL 12 There will be no adverse environmental impacts. However, social effects are not clear</p>	G3	<p>Installation of WHRB power plant creates new opportunity of employment directly and indirectly in society. It also replaces the coal based power generation, which can otherwise generate GHG emission, and create fly ash nuisance, hence society is beneficated through this project either directly or indirectly.</p>	This CL is resolved and closed



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2/3	Summary of project owner response	Validation team conclusion
CL 13 Shyam dri identified certain persons as stakeholders (1.Local authority of Village – Pandloi Gram Panchayat 2) Western Electricity Supply Company of Orissa Ltd (WESCO) 3) State Pollution Control Board, Orissa (OSPCB) 4) Ministry of Commerce and Industry.). However, how and when the views of interested parties like villagers are taken is to be verified	H 1	Shyam DRI has invited comments and views of local stakeholders i.e. villagers for WHRB Captive Power Project through newspaper advertisement, details has been elaborated in revised PDD.	Revised PDD is verified and this CL is closed
CL 14 The project activity environmentally licensed or not by the competent authority that is to be verified	Table 4 1.1	Consent to Operate from State Pollution Control is obtained; all the necessary legal clearances are obtained.	Verified the consents and this CL is closed
CL 15 The conditions of the environmental license being met or not that is to be verified.	Table 4 1.2	Consent to Establish is based on some conditions, and based on compliance only the State Pollution Control had issued the Consent to Operate (vide letter No.8791/SPCB/RO/Con-5807 Dtd.17.04.07- for 7.5 MW WHRB+10 MW AFBC and 22166 Dtd.22/07/2007- 7.5 MW WHRB, hence total 15 MW WHRB + 10 MW AFBC), hence all the environmental license conditions are fulfilled as State Pollution Control Board.	Verified the consents and this CL is closed

- 1- GUIDELINES FOR COMPLETING CDM-PDD, CDM-NMB and CDM-NMM – Version 06.2
- 2- APPROVED CONSOLIDATED METHODOLOGY ACM0004 – Version 02 – 03 March 2006
- 3- TOOL FOR THE DEMONSTRATION AND ASSESSMENT OF ADDITIONALITY (Version 04)



APPENDIX B :

CVs of Verifiers

Mr. R Sankaranarayanan: B Tech (Chemical) graduate with 23 years of experience in manufacturing industries and 9 years in Management system auditing. He has been involved in validation / Verification for more than 30 CDM Projects.

Mr. P Srinivas: He is the Lead auditor in Bureau Veritas Certification for Environment Management System, Quality Management System and Occupational Health and Safety Management System. He is Mechanical Engineer and has several years of Industrial work experience in the field of Power generation and related projects. He has undergone intensive training on Clean Development Mechanism. He is technical expert in the team and so far has carried out Validation/verification for more than 25 CDM projects.

Dr. Ashok Mammen: He is a PhD (Oils & Lubricants), M.Sc (Analytical chemistry), Over 20 years of experience in petrochemical sector. He has been involved in validation / review of more than 50 CDM projects.

Mr. Subrata Ghoshal: B.E (Mechanical), M.E (Environmental Engineering), Lead auditor of QMS, EMS, OHSAS and CDM Lead Verifier, with 13 years of experience in different industries in maintenance, marketing, product support and consultancy and one year in Management system auditing of QMS, EMS and OHSAS.

H.B. Muralidhar: He is the Lead auditor for Environmental Management System, Quality Management system and Occupational Health and Safety Management System. He has several years of Industrial work experience in the field of environmental management systems. He has undergone intensive training on Clean Development Mechanism. He is the technical expert & conducted Validation / Verification for more than 50 CDM Projects.

Mr. Sushil Budhia: He is a Chartered Accountant and has extensive experience for conducting statutory and tax audits. He has experience in internal audits and taxation matters.



APPENDIX C :
Estimated consumption

Shyam DRI Power Ltd.	Required Load(in KWh)/Ton	Production (TPA)	Estimated requirment (MWh/Year)
Sponge Iron Production	85.00	200000.00	17000.00 MWh/year
Rolling Mill	85.00	60000.00	5100.00 MWh/year
Induction Furnace	850.00	200000.00	170000.00 MWh/year
Coal Washery	15.00	300000.00	4500.00 MWh/year
Light and Fan Load	500.00		4380.00 MWh/year
TOTAL ::			200980.00 MWh/year

End of Report : INDIA-Val/ 127.49/2008