Voluntary Carbon Standard 2007.1

VALIDATION REPORT

M/S GVK Industries Limited

Combined cycle natural gas based grid connected power plant at Jegurupadu,India

Project No. / Version No.: V-1-I-01-L-0148/01

Name of Validation company:	Date of issue:
Perry Johnson Registrars CDM Inc.	2011-04-11
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VCS Validation Report for "*Combined cycle natural gas based grid connected power plant at Jegurupadu, India*"	Mathsy K
Client:	**Project Title:**
M/S GVK Industries Limited	"*Combined cycle natural gas based grid connected power plant at Jegurupadu, India*"

Summary:

The GVK Industries Ltd has commissioned Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform validation of the project – "Combined cycle natural gas based grid connected power plant at Jegurupadu, India" under Voluntary Carbon Standard (VCS) 2007.1.

The validation is an independent assessment to determine the conformance of the project activity to the requirements of VCS 2007.1, including applicable baseline methodology, demonstration of additionality, monitoring plan and the greenhouse gas (GHG) emission reduction potential.

The project activity involves installation of 228 MW natural gas (NG) (less carbon intensive fuel) based power generation unit. The electricity generated by the proposed project will be exported to the Southern regional grid and hence, displaces the carbon intensive fossil based electricity in the grid.

The project activity has correctly applied the AM0029 methodology version 03 and relevant tools from Clean Development Mechanism (CDM) to determine baseline, establish additionality and frame the monitoring plan.

PJRCDM conducted a physical verification of the project, interviewed representatives of the project proponent and carried out a review of relevant documents. A number of Clarification Requests (CLs) and Corrective Action Requests (CARs) were issued which were subsequently resolved after discussions with the project proponent. Total GHG emission reductions achievable by the project activity have been estimated at be 630,005 tonnes of CO_2 equivalent per annum.

Based on the documentation reviewed and verified, it is PJRCDM's opinion that the emission reductions from the project activity would be real, measurable, additional and permanent.

Project No. / Version No.	Number of pages
V-1-I-01-L-0148/01	1133
Work carried out by:	**Work reviewed by**
Sameer Vaze, Anjana Sharma	Mathsy Kutty.

Abbreviations

APPCC	Andhra Pradesh Power Coordination Committee
APPCB	Andhra Pradesh Pollution Control Board
APERC	Andhra Pradesh Electricity Regulation Commission
APTRANSCO	Andhra Pradesh Transport Corporation
CERC	Central Electricity Regulation Commission
CAR	Corrective Action Request
CEA	Central Electricity Authority
CL	Clarification Request
EPC	Engineering Purchase and construction
FAR	Forward Action Request
GHG	Greenhouse gases
GVKIL	GVK Industries Limited
GAIL	Gas Authority of India Limited
GCV	Gross Calorific Value
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kWh	kilo watt-hour
MW	Mega Watt
MOEF	Ministry of Environment and forests
NOC	No objection certificate
NCV	Net Calorific Value
PD	Project Description (VCS)
PJRCDM	Perry Johnson Registrars Clean Development Mechanism Inc.
PLF	Plant Load Factor
PP	Project Proponent
PPA	Power Purchase Agreement
RIL	Reliance Industries Limited
RGTIL	Reliance Gas Transportation Infrastructure Limited
UNFCCC	United Nations Framework Convention on Climate Change

VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit

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1 INTRODUCTION

The GVK Industries Limited (GVKIL) (hereinafter referred to as the "client" or "project proponent") has contracted Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform validation of the project "*Combined cycle natural gas based grid connected power plant at Jegurupadu, India*" (hereinafter referred to as the project/project activity) under the Voluntary Carbon Standard (VCS) 2007.1 standard. This report describes the validation work undertaken.

1.1 Objective

The purpose of validation is to perform an independent, third party assessment of whether the project activity conforms to the qualification criteria set out in the VCS 2007.1 standard to attain real, measurable, additional and permanent emission reductions.

The validation statement/opinion is a written assurance that the project complies with all the applicable VCS requirements and has the ability to generate the emission reductions stated over the project's crediting period.

1.2 Scope and Criteria

The validation scope includes an independent and objective review of the project's VCS project description (PD). In particular, the specific objectives of the validation work involve:

- To verify that the project activity meets the requirements of VCS 2007.1 standard including additionality, proof of title and compliance with local laws
- To assess whether the baseline and monitoring plan are in conformance with the methodology applied from the VCS approved GHG program.
- To certify that the information presented are complete, consistent, transparent and free of omission or material error.

The information in the PD is reviewed against the criteria of VCS 2007.1 standard, the VCS program guidelines, and the applied CDM methodology AM0029 version 03. PJRCDM has performed the validation based on a risk based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate Voluntary Carbon Units (VCUs).

The work carried out by PJRCDM is free from any conflict of interest.

1.3 VCS project Description

The purpose of the project activity is to set up a natural gas based combined cycle power plant with a total installed capacity of 228 MW. The plant consists of 1 no. 148MW gas turbine & 1 no. of 80 MW steam turbine. Hence, the combined generation capacity of the project is 228 MW. The generated electricity will be sold to Andhra Pradesh State Electricity Board (APSEB) which is a part of southern grid regional grid of India. The proposed plant is expected to operate at a plant load factor of 85%. This has further been confirmed from the actual PLF obtained by the power plant during its operation in the last two years.
In the absence of proposed project activity, same amount of electricity would have been generated by coal based power generation unit (detailed discussion provided in the baseline section below). Natural gas being less carbon intensive fuel compared to coal would result in greenhouse gas emissions.

The estimated amount of emission reductions from the proposed project activity are 630,005 tCO_2e per year on an average.

1.4 Level of assurance

In line with VCS 2007.1 requirements and as per ISO 14064-3:2006 para A.2.3.2, a reasonable level of assurance is defined for the validation of the project.

This implies that, based on the process and procedures conducted, PJRCDM should state whether the information in the PD

- is materially correct and is a fair representation of the actual project details, and
- is prepared in accordance with VCS requirements and the applied CDM methodology for information pertaining to additionality, GHG quantification, monitoring and reporting.

The validation work is carried out as per this requirement and details are presented in the Validation statement in section 4 below.

2 METHODOLOGY

The project activity applies approved small scale CDM methodology AM0029 version 03 under sectoral scope 1 'Energy Industries (renewable/non renewable sources)'. For Validation, PJRCDM's approach involves broadly three steps:

- Completeness check and desktop review of the project description (PD)
- Onsite inspection, interview with project representatives and issuance of findings
- Resolution of the findings followed by preparation of the validation report

The following team members from PJRCDM were involved in these steps:

Name	Role	Areas covered
Sameer Vaze	GHG Auditor	Completeness check, desktop review, on site inspection, interviewing project representatives, issuance and closure of validation findings
Anjana Sharma	Team Leader	Supervision of the entire validation activity including the desk review, site visit, identification and subsequently closure of CARs, CLs etc, and preparation of final validation report.
Mathsy Kutty	Technical Reviewer	Technical review

2.1 Review of Document

On receipt of the project description from the client, the completeness of information made available as per VCS2007.1 standard requirements is reviewed. A desktop review is further carried out to assess the following:

- Project details as per VCS PD template

- Appropriateness of methodology applied
- Compliance with relevant laws and regulations
- Correctness of application of baseline and monitoring methodology
- Demonstration of additionality
- Monitoring plan
- Stakeholder comments
- Proof of title
- Other external documents like regional grid emission factor, IPCC emission factor, etc. where applicable

A complete list of all documents reviewed is attached in Appendix - I of this report.

2.2 Follow-up Interviews

After reviewing the project documents, site visits were conducted on 3 and 4 February 2011 where physical inspection was made to verify the project details. During the visit and the follow-up meeting, interviews were conducted with the following project representatives:

Name / Designation / Company	Interviewed on
Mr. Pravin Jadhav Asst Vice President General Carbon Advisory Services	Methodology,applicability,Additionality,project emissions, emissions reduced in the project activity
Ms Manali Mane CDM Analyst General Carbon Advisory Services	Methodology ,Baseline scenario
Mr.V.Shashidhar Raju Manager-Finance GVK Technical & Consultancy Services Private Limited	Additionality,Loans,Total project cost, Total generation cost, Electricity Sale pricing, PLF, PPA, Tariff structure,
Mr.V.N.R.N.Murthy Deputy Manager-Accounts GVK Technical & Consultancy Services Private Limited	Additionality,PPA & other documents
Mr.T Srinivas Reddy Senior Mnager-Electrical GVK Technical & Consultancy Services Private Limited	Total emissions reduction, Project emissions, leakage emissions
Mr V. Murali Mohan Secretary to V.P.-Finance GVK Technical & Consultancy Services Private Limited	Consent to operate, Consent to establish, COD date ,
Mr.N Srinivasa Rao General Manager GVK Power & Infrastructure Limited	Project activity, PLF, Heat Rate, Reliance gas NCV, Supply of Natural Gas ,Emergency plan, local stakeholder meet
Mr A Gopala Krishna	Frequency of calibration, procedures, joint

Manager-Operations GVK Power & Infrastructure Limited	meter reading , actual project operation, gas invoices, emergency prepared plan,

During the site visit, PJRCDM verified the actual operation of the project as described in the PD.

2.3 Resolution of any material discrepancy

Based on the site inspection and review of documents including the monitoring plan issues that need to be further elaborated upon, researched or added in order hat the project activity meets the VCS 2007.1 requirements and can achieve credible emission reductions is identified, clarified and to be resolved by the project proponent. A corrective Action Request (CAR) is raised if one of the following occurs:

a. The project participants had made mistakes that will influence the ability of the project activity to achieve real, measurable and additional emission reductions;

b. The VCS 2007.1 standard requirements, including the specific requirements of the methodology applied, have not been met;

c. There is a risk that emission reductions cannot be monitored or calculated

If information made available is insufficient or not clear/transparent enough to determine whether the applicable VCS requirements have been met, a clarification request (CL) is raised and communicated to the project proponent.

Observations may also be raised which are for the benefit of future verification period- called as Forward Action Requests (FARs). These, however, have no impact upon the completion of the current validation activity.

On receipt of response and revised PD from the project proponent, the adequacy of compliance with VCS and the methodology requirements is checked. Closure of comments raised occurs only if the response provided and corrections made fully comply with the stated requirements of the VCS2007.1 standard and the methodology applied

The list of CARs/ CLs/ FARs raised and the response provided, the means of validation, reasons for their closure, and references to correction in the PD are provided as Appendix-II to this report.

3 VALIDATION FINDINGS

3.1 Project Design

Project design/Technology used

The project envisages setting up a combined (gas and steam) cycle power plant with an installed capacity of 228 MW consisting of one gas turbine of 148 MW installed capacity and one Heat Recovery Steam Generator Unit (HRSGU) coupled to a steam turbine generating unit of 80 MW rated capacity along with all other electrical systems, controls and instrumentation, civil, structural and architectural works. The rating of the power plant is 228 MW at PLF of 0.85 in the combined cycle.

The steam turbine generator would be of the condensing non reheat type.

Table 3.1

Technical details of the project activity

Contract capacity(MW)	220
Auxiliary consumption (%)	3
Gross electricity generation(MW)	228
Plant load factor	85
Gross electricity generation(GWh)	1697
Auxiliary consumption(GWh)	50
Net electricity generated(GWh)	1647
Heat rate (kcal/KWh) on NCV	1682
Calorific value of fuel(kcal/scm)	9384
Fuel requirement (standard cubic metre-scm)/annum	30,42,52,146
Fuel requirement (standard cubic metre-scm/day)	833567

The project duration is 15 years.

Start date of the project is 14 April 2009 as per date of commissioning /44/ of the project activity in line with VCS 2007.1.

Crediting period for the project activity is 10 years starting from 14 April 2009.

Project duration, crediting time and project start date

The duration of the project activity is 15 years which was cross-checked with the purchase order copies. The project proponent has considered 14 April 2009 as the project start date. The selected project start date is in line with the VCS policy guidance (VCS 2007.1) which says *"the project start date is identified as the date when the project activity began reducing or removing GHG emission"*.

The project activity has applied for carbon credits under UNFCCC's CDM. The crediting period being considered under VCS 2007.1 shall, therefore, start from 14 April 2009 and shall extend till the date of registration with CDM. The project proponent has opted for a renewable crediting period of 10 years with one time renewal. The selected crediting period is reasonable keeping in view VCS 2007.1 guidance for such projects.

Double counting and whether the project participated in another emission trading programme

The proposed project is already under CDM validation and as per the CDM procedures; the crediting period for the CDM project will start only from the date of registration of the project by UNFCCC Executive Board. Hence, the emission reductions prior to that date can be claimed only as the VCUs under the VCS programme.

Project applicability to the VCS for projects rejected under other GHG programme (if applicable)

The proposed project is already under CDM validation. It has not been rejected till now 1 April 2011 by any other GHG program.

Whether the project is eligible under the VCS:

The proposed project is a renewable electricity project. It entails generation of power from combined cycle power plant using natural gas and exporting it to the regional grid. A mix of fossil fuel and other fuels based power plants export power to this grid and hence power generation by this mix would contribute to anthropogenic CO_2 emissions. The project activity would displace equivalent amount of power being generated in the grid and thus equivalent amount of CO_2 emissions. The project is also demonstrated to be additional compared to the business as usual scenario, hence, the project is anticipated to fulfil VCS 2007.1 conditions and qualify for carbon finance.

3.2 Baseline and demonstration of additionality

The project proponents have applied approved baseline methodology AM 0029 version 03 which has been approved under the CDM programme. The total installed capacity of the project activity is 228 MW. The application of baseline methodology is justified as follows:

1. The project activity is the construction and operation of a new natural gas fired grid connected electricity generation plant:

During the site visit, PJRCDM observed that the proposed project is referred as the expansion project of the existing 235 MW NG based power plant commissioned in year 1996-98. Most the approval documents like gas supply agreement with GAIL etc refers the proposed project as expansion project. However, during the site visit, PJRCDM observed the actual layout of the proposed project and its link to the existing NG based power plant (commissioned in 1996-98). PJRCDM was able to verify the following:

The proposed project does not share any fuel supply arrangement with the existing plant. The existing NG based power plant is sourcing the fuel (NG) from GAIL while the proposed project is sourcing it from Reliance Industries Ltd. using GAIL infrastructure. Separate pipelines have been provided for fuel feeding to both the plants (existing as well as proposed project).

Both the plants can operate independent of each other and do not share any resources.

PJRCDM was also able to verify the PPA and EPC contract for the proposed project. Both these documents though refer the proposed project as expansion project, clearly hints that the proposed project is a newly constructed natural gas based project.

Based on the site visit observations and also the documents verified by PJRCDM, it is concluded that the proposed project is a newly constructed NG based power generation unit.

2. The geographical/physical boundaries of the baseline grid can be clearly identified and information pertaining to the grid and estimating baseline emissions is publicly available

Southern regional grid of India has been considered as the baseline grid for the proposed project. The information pertaining to the selected grid and estimating baseline emission is publicly made available by the Central Electricity Authority (CEA).

3. Natural gas is sufficiently available in the region or country, e.g. future natural gas based power capacity additions, comparable in size to the project activity, are not constrained by the use of natural gas in the project activity:

Region selected to demonstrate the gas availability: PP has selected Andhra Pradesh (Indian state where the proposed project is located) as the region to demonstrate the surplus availability of the natural gas. The sources of natural gas in the state and also the current consumption areas and also the projected future consumption pattern have been presented to demonstrate the surplus availability of the gas. The results of the entire discussion are as presented below:

S.N.	Year	2007-08	2008-09	2009-10	2010-11	2011-12
1	Total supply –Optimistic (BCM)	40.51	56.06	88.50	97.49	104.18
2	Total demand (BCM)	65.40	71.77	82.31	95.66	101.99
3	Demand supply gap (optimistic)	24.89	15.72	-6.19	-1.83	-2.19

Source: XI five year plan of India.

The above statistics provides information regarding the gas consumption, availability and also the projected gas availability and demand. This table clearly demonstrate the surplus availability of the natural gas in the region at the time when the project started operations and also in the near future.

In addition to above, PJRCDM also observed from the recent media news regarding the discovery made by Reliance industries. The projected supply from the new gas discovery is expected to be 80 MMSCM while the demand is expected to be 61 MMSCM. These statistics also clearly demonstrate the surplus availability of natural gas in the region as on date.

PJRCDM also analysed the future projections of the natural gas resources and the expected demand scenario of natural gas in the project area. Based on the various documents verified, PJRCDM was able to verify that due to:

- Previous trends in the natural gas availability (which has always shown increasing trends).
- Attractive Government schemes for oil and natural gas explorations (Which has resulted in entry of private players into this stream of business)
- Planning for natural gas imports (Iran-Pakistan- India pipeline, Turkmenistan-Afghanistan-Pakistan-India Pipeline etc.
- Probable Liquefied Natural gas imports

Project region is expected to have surplus gas availability in the near future.

Backup documentation related to all the above statistics has been verified by PJRCDM. Based on the discussion provided and the back-up documentation verified, PJRCDM is of the opinion that proposed project meets the applicability condition 3 of the baseline and monitoring methodology AM0029, version 03.

Baseline Determination:

Identification of baseline scenario has been done in accordance with the methodology AM 0029 version 03.

1. *Identification of plausible baseline scenario alternatives*:

Plausible alternatives to the proposed project are:

A) *The project activity of 228 NG based Power Plant not taken as a VCS activity*:

The purpose of the project activity is to generate electricity from the natural gas and deliver it to the southern regional grid to meet the base load power requirement of the grid. This can be a plausible baseline scenario but faces barriers as discussed below.

B) *Power generation using natural gas as a fuel but with different alternate technology:*

Different plausible alternatives for NG based power generation in the region are as follows

B.1) *Power generation using combustion turbine with a capacity of 228 MW in open cycle.*

Though this option would be able to deliver similar services as that of project but the overall efficiency of this option is much lower (39%) than the similar capacity combined cycle power plant (app 51%). Hence, cannot be considered plausible alternative scenario in the absence of project activity.

B.2) *228 MW Power generation with gas turbine in cogeneration mode:*

This alternative is in line with the local laws and regulations. In addition to that, this alternative can be considered as similar as the project activity in terms of generated power. However, the proposed project is only power generation and there is no requirement of steam generated by the cogeneration unit neither there is any industry in the vicinity where this steam can be sold. Hence, this cannot be considered as plausible alternative scenario in the absence of project activity and has been eliminated from further discussions on baseline determination.

Based on the above analysis, alternative (B) cannot be considered as a plausible alternative in the absence of project activity.

C) *Power generation using energy sources other than natural gas:*

Different plausible alternatives in the region for power generation based on fuel other NG are as follows:

C.1) *Power generation with 250 MW thermal power plants using coal as the energy source with an efficiency of 34%-36% with a life of 25-30 years:*

This is a realistic and credible alternative to the project proponent which delivers base load power to the grid. This alternative can meet the base load of southern grid. This option can be a plausible baseline scenario.

C.2) *Power generation with thermal power plants using lignite as the energy source:*

The option is not a plausible scenario given its low calorific value and property of spontaneous combustion. Thus, the option is limited to the source as there can be problems in the transport and storage of lignite due to its property of spontaneous combustion. It is to be noted that there is no source of lignite in the project region and even the state of Andhra

Pradesh, hence, this alternative is not considered as reasonable alternative in the absence of project activity.,

C.3) *Power generation using wind as the energy source with an average PLF of 20%:*

Power generation from wind does not meet the base load requirement for the grid on a continuous basis as wind is seasonal in nature and the capacity utilization factor is very low. Due to the high uncertainty of wind, it is not a credible and realistic option for the project proponent for such high capacity comparable to the project activity.

C.4) *Power generation using hydro as the energy source:*

C.4.1) *Reservoir storage based hydro power plants:*

This cannot be a plausible baseline scenario as it delivers peak-load power to the grid and not the base load power.

C.4.2) *Run-of-river based hydro power projects:*

Power generation from hydro is not a feasible alternative to the project activity as it involves high gestation periods and also cannot meet the base load power requirement for the grid on a continuous basis due to the uncertainty of monsoons.

C.5. *Power generation using cluster of diesel engine based power plants with an efficiency of 50% and a lifetime of 15 years:*

The ever increasing fuel prices and the present government policy does not make this option as a realistic baseline scenario.

C.6. *Power generation using nuclear fuel:*

This scenario is available only to Nuclear Power Corporation of India Limited, a 100% Government of India owned Company. The capacity additions in case of nuclear power plants are controlled by Government of India based on long term strategic programmes. Hence, this alternative is not available to any other stakeholder in the country. Keeping this in mind, this alternative has not been considered as plausible alternative scenario.

C.7. *Electricity generation using naphtha as fuel:*

The naphtha based power plant comprises naphtha turbine and heat recovery system in the combined cycle mode. However, in year 2000, APTransco stopped all future liquid fuel (including naphtha) projects. Under such a scenario, this alternative cannot be considered a realistic alternative in the absence of project activity.

C.8. *Coal fired supercritical power plant:*

The coal fired supercritical power plant is a new advanced technology. However, the technology was not available in India in year 2003 (when the PP decided to implement the proposed project). The first supercritical power plant was built in India in year 2006. Thus this cannot be a plausible baseline scenario.

C.9.*Electricity imports from other grids:*

This is not a realistic alternative since other grids are facing power shortage during peak demand.

C.10) *Electricity generation with Biomass as fuel:*

Biomass based power projects generally operate in cogeneration mode and mostly the industries such as sugar plants that produce biomass and need steam for the process have biomass based projects. Further, this alternative cannot be considered as plausible alternative for such a large capacity (228 MW) as continuous supply of substantial amount of biomass is required to continuously run the power plant. Hence, this alternative has been eliminated from further discussion.

From the above analysis, alternative (C) cannot be considered as a plausible alternative for any stakeholder in the region in the absence of project activity.

Based on the analysis of above mentioned alternatives, the most plausible alternatives are:

a) The project activity i.e. 228 MW NG based combined cycle power plant with an efficiency of 50%-55% in combined cycle mode of operation and with a lifetime of 15 years not taken as a VCS project activity.
b) Power generation using coal as the energy source with an efficiency of 35%-38% with a life of 25-30 years.

As per baseline and monitoring methodology, both these alternatives are further analysed to arrive at the final baseline scenario for the proposed project:

2. *Economically most attractive baseline scenario alternative using investment analysis.*

To arrive at the most attractive option, PP has selected levelised cost of electricity generation as the financial indicator. The input values used for the calculations of levelised cost of generation for both the options have been verified by PJRCDM and are found to be reasonable and conservative.

Techno Economic parameters 228 MW NG based power plant			References
Installed Capacity	228	MW	EPC (GT = 148 MW and HRSG = 80 MW)
Total Investment	7189.09	Million INR	Common loan agreement – Pg. 134 (site development cost 7 Mn removed and land cost as per sale deeds) pg. 121
Debt: Equity	100:0	-	
Rupee Debt	4843.84	Million INR	
US Dollar Debt	2345.25	Million INR	
Exchange rate	1 USD = 47 INR		
O&M Costs	3.88% of the capital Cost	-	Common Loan Agreement
O&M US $ Portion	65% with an escalation of 2% every annum	-	
O&M Rupee Portion	35% with an escalation of 5% per annum	-	
Plant Load Factor	85	Percentage	Financial appraisal
Auxiliary Consumption	3	Percentage	CERC (Terms & Conditions of Tariff) Regulations, 2001, pg. 8
Total Units Sold	24,719	GWh for 15 years	Estimated for project capacity at 85% PLF

Net Calorific Value	8570	kcal/SCM	Invoices from fuel supplier (GAIL)
Station Heat Rate	1850	kcal/ kWh	PPA June 2003, pg. 13
Fuel Charges	8,644.20 INR/ 1000 SCM	-	Latest Invoice for gas bill from GAIL
Book Depreciation Rate (Straight Line Method basis)			
Plant and Machinery	8.24	Percentage	As per the rates applicable to Power Generating Units
Book Depreciation up to (% of asset value)	90	Percentage	
Income Tax			
Income Tax rate	35	Percentage	IT Rules
Minimum Alternate Tax	7.5	Percentage	
Surcharge	2.5	Percentage	
Dividend Distribution Tax	12	Percentage	
Working capital			
Receivables (No. of days)	35	-	Common Loan Agreement
Spares	1% of Capital Cost	-	
Working capital interest rate	13	Percentage	
Working Capital Margin	25% of the working capital	-	
Working Capital Loan	75% of working capital	-	

Techno Economic parameters for power generation using coal as the energy source		
Installed Capacity	250 MW	CERC (Terms & Conditions of tariff) Regulations, 2001
Total Investment	9,977 Million INR	Estimate by PP based on TEC available for other plant
Debt : Equity	70:30	CERC (Terms & Conditions of tariff) Regulations, 2001
O&M Costs + Insurance Charges	2.5% of the capital Cost	CERC (Terms & Conditions of tariff) Regulations, 2001, pg. 11
Plant Load Factor	85 %	
Auxiliary Consumption	9.5%	CERC (Terms & Conditions of tariff) Regulations, 2001, pg. 8
Total Units Sold	33,716 Million kWh for 20 years	
Return on Equity	16 %	CERC (Terms & Conditions of tariff) Regulations, 2001
Gross Calorific Value	4,706.50 kcal/kg	Price Notification No. 7/2001-2002 dated 9th April, 2001 from The Singereni Collories Co. Ltd

Station Heat Rate-Stabilization	2,600 kcal/ kWh	CERC (Terms & Conditions of tariff) Regulations, 2001
Station Heat Rate- Post Stabilization	2,500 kcal/ kWh	
Fuel Charges	1,356.72 INR / 1,000 kg	Price Notification No. 7/2001-2002 dated 9th April, 2001 from The Singereni Collories Co. Ltd
Depreciation rate for revenue calculation (Straight Line Method basis)		
Civil Works	7.84%	Electricity Supply Act
Plant and Machinery	7.84%	Electricity Supply Act
Book Depreciation up to (% of asset value)	90%	Electricity Supply Act
Book Depreciation Rate (Straight Line Method basis)		
Civil Works	3.34%	Company's Act
Plant and Machinery	5.28%	Company's Act
Book Depreciation up to (% of asset value)	95%	Company's Act
Surcharge	2.5%	IT Rules
Dividend Distribution Tax	12%	IT Rules

Based on the above input values, the results are as follows:

Sr. No.	**Baseline Scenario**	**Levelized Cost of generation (INR/ kWh) at 85% PLF**
(a)	Power generation using Natural Gas as the energy source	2.25
(b)	Power generation using coal as the energy source	1.49

From the above table, it is clear that the coal based power generation is financially most attractive option as compared to proposed project activity without VCS revenues.

PP has also carried out the sensitivity analysis to check the robustness of the financial analysis presented. Following parameters have been considered for sensitivity analysis:

- Fuel price.
- Station heat rate.
- Plant load factor.

The results of sensitivity analysis are as presented below:

Sensitivity analysis considering variation in fuel price		
Price of fuel	-10%	+10%
Levelized cost of electricity generation for power generation using natural gas	2.09	2.41
Levelized cost of electricity generation for power generation using coal	1.42	1.56

Sensitivity analysis considering variation in heat rate		
Heat rate change	-10%	+10%

Levelized cost of electricity generation for power generation using natural gas as energy source	2.15	2.36
Levelized cost of electricity generation for power generation using coal	1.42	1.56

Sensitivity analysis considering variation in Plant Load Factor (PLF)		
PLF	-10%	+10%
Levelized cost of electricity generation for power generation using natural gas as energy source	2.33	2.20
Levelized cost of electricity generation for power generation using coal	1.57	1.42

The results of sensitivity analysis clearly shows that the even after the variation in the above parameters, coal based power generation is still the most attractive option.

Keeping in view the above discussion, coal based power generation has been considered as the baseline scenario for the proposed project.

Additionality discussion:

Step 1:

Benchmark Analysis: As required by the baseline and monitoring methodology AM0029, version 03, PP has also carried out benchmark analysis to demonstrate the additionality of the project. Levelised cost of power generation has been considered as the financial indicator which has been compared against the benchmark levelised cost of electricity generation for fossil fuel based power generation unit.

The benchmark used for the proposed project is the average cost of generation in central sector coal stations in year 2004 i.e. during the time PP decided to implement this project. PJRCDM has verified the source of information for the benchmark selected (Lok Sabha Starred Question no 428, dated 25 August 2006) and observed that the selected benchmark is the most conservative in comparison to cost of generation of electricity using other fossil fuels.

It is seen that the cost of electricity generation using NG as fuel Rs 2.25/kWh is much higher compared to the benchmark of Rs 1.42/kWh.

Step 2:

Common Practice Analysis: PJRCDM verified the region-wise installed capacity and the given statistical data. The data provided clearly demonstrate that the natural gas based power generation accounted only 11% of the total installed capacity in India and only 9% of the total power generation in Southern region of India. From the analysis provided on common practice in the region, it is seen that the scope of existing and upcoming natural gas based power generation projects of similar or higher scale is low. The three similar projects identified of similar capacity are also seeking CDM benefits. Thus, all the projects with similar tariff structures as the project activity are in different stages of CDM registration process.

Based on the above discussion, it is concluded that the proposed natural gas based power plant is not a business as usual scenario and the emission reduction resulting from the proposed project are thus additional.

3.3 Monitoring Plan

The project proponents have applied approved baseline methodology AM0029 version 03 "Grid Connected electricity generation using Natural gas" which is approved under VCS 2007. The project activity satisfies all criteria for AM0029 version 03.The application of monitoring methodology is assessed as correct.

The monitoring plan as provided in the VCS PD provides detailed information related to the collection and archiving of all relevant data needed to:

a) Estimate and measure emissions occurring from GHG sources, sinks and reservoirs.

b) Determine the baseline emissions.

c) Estimate changes in emissions from the site.

Parameters included in the monitoring plan:

Net electricity exported by the project activity to the southern regional grid:

Energy meter (main meter) located in the tariff metering room will be used as the primary source of information for this parameter. The installed meter is of 0.2 class accuracy and will be calibrated by approved agencies on annual basis. Daily readings will be stored in the plant log books and checked by the shift engineer and cross checked by electrical engineer. PP has also installed another check meter at the same location in order to confirm the readings shown by the main meter or in case of any discrepancy in the main meter.

Fuel consumption (natural gas consumption) of the project activity:

This parameter is also monitored at two points. One at the supplier (GAIL) terminal and other at PPs end. The monitored value at the suppliers terminal is the primary source for this parameter and the same will be used for emission reduction calculations. The flow meter readings (at supplier's end) can be cross verified against the invoices issued by the supplier. In addition to above, the meter provided at PP's end will also be used for cross check purpose. Both the meters will be calibrated meters. The supplier meter will be calibrated as per their standard procedures and the meter at PPs end will be calibrated annually.

Net calorific value of natural gas:

This value has been included in the monitoring plan. The same will be monitored at suppliers end and the value of the same would be included in the monthly invoice issued by the supplier for the gas consumed. The same will be considered as the primary source of information for this parameter. PP has also installed the instruments at their end to monitor the NCV of the gas consumed. However, this value will be used as a cross check point. In case, the supplier invoice provides gross calorific value of natural gas, same will be converted to NCV using the this GCV and delta factor of 10% (CEA CO2 baseline database for Indian Power Sector, Database Excel Sheet, Assumptions worksheet, Cell F8).

Build margin emission factor:

Emission factor based on the latest information available during a particular crediting period would be used for emission reduction calculations.

LNG consumption:

This parameter (if applicable) would be monitored by the gas flow meter installed at the supplier's terminal. Value of this parameter would be cross verified against the invoices issued by the supplier.

Any other fossil fuel consumption for the start-up or emergency purpose:

If there is any other fossil fuel consumption for the project, the same will be monitored and considered in the final emission reduction calculations.

Emission factor and oxidation factor for natural gas:

For estimation purpose, the same has been sourced from the IPCC default values, however, during the crediting period, if there is any change in the IPCC default values, the revised values would be applied for the actual emission reduction calculations during the crediting period.

3.4 Calculation of GHG Emissions

GHG emission reduction achieved by the project activity is calculated as the difference between the baseline emission and the project emission as well as the leakage emission.

Baseline emissions:
Baseline emissions have been calculated by multiplying the electricity generated in the project plant ($EG_{PJ,y}$) with a baseline CO_2 emission factor ($EF_{BL,CO2,y}$), as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{BL,CO2,y}$$

Wherein,

$EG_{PJ,y}$ – is the electricity generated by the proposed project. For estimation of emission reductions in the VCS PD, this parameter i.e. equivalent to 1646.8 GWh per year has been estimated based on the rated capacity of the project, plant load factor and operational hours, however, the same will be monitored during the crediting period and will form the basis for the actual emission reduction calculations.

$EF_{BL,CO2,y}$ Emission factor of the baseline fuel. According to the approved methodology AM0029 version 3, project participants are required to use the lowest emission factor among the following three options:

For the first crediting period:

Option 1: The build margin, calculated according to "Tool to calculate emission factor for an electricity system"; and

Option 2: The combined margin, calculated according to "Tool to calculate emission factor for an electricity system", using a 50/50 OM/BM weight.

Option 3: The emission factor of the technology (and fuel) identified as the most likely baseline scenario under "Identification of the baseline scenario" above, and calculated as follows:

PJRCDM verified the values of emission factor as per all the three options as stated above. The results are as presented below:

For option 1, the build margin: PP has sourced the data from the Central Electricity Authority (CEA) India according to the procedures prescribed in the "Tool to calculate emission factor for an electricity system". The sourced value (0.817 tCO_2/MWh – Build Margin for Southern Regional grid) is the latest value available at the time of project start date.

For option 2, the combined margin: The combined margin is also sourced from the Central Electricity Authority (CEA) valid at the time of project start date. As per CEA, the combined margin for Southern Regional grid is 0.902 t CO_2/MWh.

For option 3, coal fired power plant: coal fired power plant using conventional i.e. sub-critical technology (33.3% efficiency) – This option has been considered as the most likely option in the absence of project activity. The emission factor for this technology (Assuming the plant efficiency of 33.3%) has been estimated to be 1.036 t CO_2/MWh The calculations have been verified by PJRCDM and are found to be reasonable and conservative.

Keeping in view, the above values for 3 options, the emission factor as per option 1 is the lowest and hence, the same has been considered for the baseline emissions. This parameter is fixed *ex-ante* and the same would be applied throughout the first crediting period.

Using the above values, the estimated annual baseline emissions are 1,346,883 tCO_2e/annum

Project emissions: Since the proposed project activity is natural gas based power generation, hence, that becomes the main source of project emissions. The same has been calculated using the formula as provided below:

$$PE_y = \sum_f FC_{f,y} * COEF_{f,y}$$

Wherein,

$FC_{f,y}$ is the total volume of natural gas or other fuel 'f' combusted in the project plant or other startup fuel (m^3 or similar) in year(s) 'y'. For the estimation purpose, this value has been estimated based on the rated capacity of the plant, plant load factor, station heat rate and operational days, however, the same would be monitored during the crediting period.

$COEF_{f,y}$ is the CO_2 emission coefficient (tCO_2/m^3 or similar) in year(s) for each fuel and is obtained as:

$COEF_{f,y} = \Sigma NCVy \times EFCO_{2f,f,y} \times OXIDf$

Where:

NCVf,y is the net calorific value (energy content) per volume unit of natural gas in year 'y' (GJ/m^3).This value has been obtained from the supplier's (GAIL)

invoice and the same would be the source of the data during the crediting period as well.

$EF_{CO2,f,y}$ is the CO_2 emission factor per unit of energy of natural gas in year 'y' (tCO_2/GJ) as determined from the fuel supplier, wherever possible, otherwise from local or national data is a fixed parameter throughout the crediting period.

As supplier of gas does not specify emission factor, also NATCOM report is checked and it has also referred IPCC for this value. Thus, IPCC default is used as per the preference order in the methodology.

$OXID_f$: is the oxidation factor of natural gas is fixed parameter throughout the crediting period.

Based on the above values, the project emissions for the proposed project are estimated to be 670,500 tCO_2e/annum

Leakage emissions: In line with the baseline and monitoring methodology, leakage has to be calculated due to the following:

$$LE_y = LE_{CH4,y} + LE_{LNG,CO2,y}$$

a) Leakage emissions due to fugitive upstream CH4 emissions.($LE_{CH4,y}$)
b) Leakage emissions due to fossil fuel combustion / electricity consumption associated with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system.($LE_{LNG,CO2,y}$) Since the proposed project does not consume any LNG in the current scenario, hence, no leakage has been considered for emission reduction estimation in the VCS PD. However, the same has been included in the monitoring plan in case, PP wishes to use LNG as fuel in the proposed project activity.

Leakage emissions due to fugitive upstream CH4 emissions ($LE_{CH4,y}$)**: This has been calculated using the formula as presented below:**

$$LE_{CH4,y} = \left[FC_y \cdot NCV_y \cdot EF_{NG,upstream,CH4} - EG_{PJ,y} \cdot EF_{BL,upstream,CH4}\right] \cdot GWP_{CH4}$$

where:

$LE_{CH4,y}$: Leakage emissions due to fugitive upstream CH_4 emissions in the year y in t CO_2e

FCy: Quantity of natural gas combusted in the project plant during the year *y* in m^3. for emission reduction estimation in the VCS PD, this parameter has been estimated based on the rated capacity of the plant, plant load factor, station heat rate and operational hours in a year. However, during the crediting period, this will be monitored value.

$NCV_{NG,y}$ Average net calorific value of the natural gas combusted during the year *y* in GJ/m³ - This value is sourced from the gas supplier's invoice (GAIL invoice). This parameter is included in the monitoring plan and the same will be used for emission reduction calculation during the crediting period.

$EF_{NG,upstream,CH4}$ Emission factor for upstream fugitive methane emissions of natural gas from production, transportation, distribution – This parameter is sourced from the default values as stated in the baseline and monitoring methodology AM0029 (table 2).

$EG_{PJ,y}$ Electricity generation in the project plant during the year in MWh. For the estimation purpose, this value is estimated to be 1646.8 GWh per year based on the capacity of the plant and assuming plant load factor of 85%. However, the same will be monitored during the crediting period.

$EF_{BL,upstream,CH4}$ Emission factor for upstream fugitive methane emissions occurring in the absence of the project activity in t CH_4 per MWh. This parameter has been calculated in line with the baseline emission factor (build margin). The provided calculations have been verified by PJRCDM and found to be reasonable and conservative.

GWP_{CH4} Global warming potential of methane valid for the relevant commitment period

Based on the above parameters, the leakage emissions estimated for the proposed project is 46,378 tCO_2e.

Emission reduction resulting from the project activity have been calculated as :

$$ERy = BEy - PEy - LEy$$

ERy = 1,346,883– 670,500 – 46,378= 630,005 tCO_2e/annum

The PJRCDM's validation team has checked the underlying input values as well as the computation of emission reductions in the emission reduction spreadsheet. The estimation of the emission reduction has been presented in a transparent and conservative manner and the discussion regarding the same is well documented under section 4.2, 4.3 and 4.4 of the VCS PD.

3.5 Environmental Impact

The project activity obtained all the consents from the state pollution control board (Consent to Establish and Consent to Operate) and the clearance from the Ministry of Environment an Forests has also been obtained.

A comprehensive environmental impact assessment study has been conducted for the project and Environmental impact assessment report /41/ prepared by M/S VIMTA LABS Ltd were

verified and found that the impact of the project activity on the environment is not significant. More over Approval letter /09/ from Energy Department of Andhra has also been obtained

3.6 Comments by stakeholders

A stakeholder's consultation meeting was organized on 1 December 2007 at GVKPIL Plant Jegurupadu. GVKPIL identified local villagers, local NGO, employees of GVK Power Plant, government officials as the most important stakeholders, with an interest in the CDM activities. Accordingly the stakeholders were duly informed of the consultation meeting through written invitations. A record of these invitations is available with the project proponents. For the stakeholders that could not come for the meeting, another 15 days time was given to contact the Director Technical to inform about their concerns and opinions.

Comments of stakeholders were recorded during the stakeholder meeting.

The stakeholders meeting process was followed in the following sequence :

- Welcome address
- Election of the chair of the meeting and approval of the proposed agenda
- Presentation of the CDM-Kyoto Protocol and role of local stake holder
- Presentation of the projects undertaken by GVK Group.
- Discussion and articulation of concerns
- Chair summarizing the local stake holder concerns
- Vote of thanks followed by tea

The persons attending the stakeholder meeting have signed an attendance sheet. All the relevant stakeholders have provided positive opinion about the project

4 VALIDATION CONCLUSION

PJRCDM Inc. has performed the validation of the project "*Combined cycle natural gas based grid connected power plant at Jegurupadu, India*". The validation was carried out to independently assess whether the project conforms to the qualification criteria and requirements of Voluntary Carbon Standard (VCS) 2007.1, including the baseline and monitoring methodology applied. The VCS Program provides the standards and framework for independent validation based on ISO 14064-2:2006 and ISO14064-3:2006 standards.

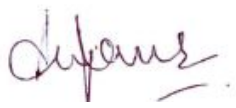
PJRCDM's approach is risk-based, drawing on an understanding of the risks associated with the meeting of VCS 2007.1 standard requirements. The assessment was based on the review of project description (PD), supporting evidences, site interview, including other explanations where necessary to enable PJRCDM to provide reasonable assurance that the information reported in the VC PD version 04 dated 31 March 2011 is complete and materially correct. Our scope and conclusion is thus limited to the above evaluation.

The purpose of the project activity is to set up a natural gas based combined cycle power plant with a total installed capacity of 228 MW to meet the contract capacity i.e.net electricity generation of 220 MW and exporting power to the southern regional grid. The VCS approved CDM baseline and monitoring methodology AM0029 version 03 has been correctly applied to determine the baseline and the emission reductions.

In our opinion, it is sufficiently demonstrated that the project is not the baseline scenario and emission reductions resulting from the project activity are real, permanent and are additional to what would have occurred in the absence of VCS project activity. Further, the monitoring plan makes adequate provision for ensuring transparency and accuracy during project monitoring.

The total GHG emission reduction achievable from the project is estimated at 630,005 tonnes of CO_2 equivalent per year over the 10 year crediting period starting from 14 April 2009. This estimate is fair given that the underlying assumptions do not change.

To summarize, it is PJRCDM's opinion that the project as described in the version 04 of the VCS PD dated 31 March 2011 "Combined cycle natural gas based grid connected power plant at Jegurupadu, India" meets the VCS 2007.1 requirements and correctly applies the baseline and monitoring methodology version 03 of AM0029.



Project Manager

PJRCDM

Site Program Manager

PJRCDM

APPENDIX I: DOCUMENTS REVIEWED

Sl. No.	Document reference
[01]	O & M Agreement between GVK Industries Ltd & GVK Energy Ltd dated 1 November 2010
[02]	Certificate of Incorporation issued by Registrar of Companies –Andhra Pradesh dated 18 June 1992
[03]	Approval Letter from Energy Department-Andhra Pradesh to establish 440 MW power plant in 2 phases dated 17 April 2001.
[04]	Letter from Ministry of Petroleum and Natural gas for allocation of Naphtha dated 6 August 1999.
[05]	Letter from Ministry of Petroleum and Natural gas for allocation of Natural gas dated 9 July 1999
[06]	No objection certificate from Airports Authority of India dated 31 December 1996
[07]	Environmental clearance from Ministry of Environment and Forests
[08]	No objection certificate from Andhra Pradesh Pollution Control Board(APPCB) dated 24 May 2000
[09]	Consent letter for establishment from APPCB dated 20 April 2000
[10]	Letter from Government(Govt) of Andhra Pradesh(A.P.)for disposal of surplus treated water dated 17 May 1997
[11]	Permission letter from Energy Department(Dept)-Govt of A.P.for implementation of project activity dated 15 December 2000
[12]	Water Consent from Govt of A.P.for establishment of 400 MW based power plant dated 16 October 1992
[13]	Contract Amendment letter between GAIL India Limited(GAIL) and GVK Industries Limited(GVK Industries Ltd) dated 31 December 2008
[14]	Letter from Dept of Explosives, south circle office, Govt of A.P. for storage of chlorine gas dated 7 July 2005
[15]	Annual report of GVK Industries Ltd for the year 2002-03
[16]	Notice to proceed letter from ICICI bank to EPC contractor dated 15 January 2004
[17]	Amendatory Agreement of common loan agreement dated 24 December 2005
[18]	Deed of accession executed by company dated 24 December 2005
[19]	Deed of Acceptance executed by company dated 24 December 2005
[20]	Appointment letter issued by lenders
[21]	Deed of Accession for appointment of security trustee
[22]	Insurance letter from United India Insurance Co. Limited for the period 15 December 2010 to 14 December 2011
[23]	Amendment letter from GAIL for transmission of Natural Gas(NG) dated 27 October 2009
[24]	Letter from RIL Petroleum Business (E and P) gas sales and purchase agreement

	dated 17 April 2009
[25]	Gas transmission agreement(GTA) between GAIL and GVK Industries Ltd dated 13 April 2009
[26]	Amendment letter to GTA by Reliance Gas Transportation Infrastructure Limited(RGTIL) dated 17 April 2009
[27]	Amendment letter from GAIL for gas transmission dated 1 December 2009
[28]	Amendment letter from RGTIL for gas transportation dated 23 January 2010
[29]	Amendment letter from RGTIL for gas transportation dated 25 November 2009
[30]	Amendment letter from RGTIL for gas transportation dated 24 November 2009
[31]	Amendment letter from RGTIL for gas transportation dated 25 September 2009
[32]	Amendment letter from RGTIL for gas transportation dated 17 April 2009
[33]	Amendment letter from Reliance Industries Limited (RIL) E and P dated 23 January 2010
[34]	GAIL invoices of May 2003
[35]	Plant land cost beak-up
[36]	Power Purchase Agreement(PPA) between Transmission Corporation of A.P. and GVK Inds Ltd dated 18 June 2003
[37]	EPC contract between GVK Industries Ltd and Alstom (Switzerland) Ltd supplies agreement dated 14 June 2003
[38]	First amendment to agreement for Engineering (Engg.)and Construction(Cons.)services with Alstom Projects India Ltd dated 14 January 2004
[39]	Agreement for contract of services with Alstom(Switzerland) Ltd dated 14 June 2003
[40]	CIF agreement with Alstom(Switzerland) Ltd dated 14 June 2003
[41]	Rapid Environment Impact Assessment(REIA) report by VIMTA LABS Ltd dated
[42]	Notification from Ministry of Power regarding Mega Power projects gas plant life
[43]	Amendment to contract between GAIL and GVK Industries Ltd dated 19 June 2004
[44]	Letter from Andhra Pradesh Power Co-ordination Committee(APPCC) regarding Commercial Operation date(COD) dated 13 May 2009
[45]	Letter from APPCC for gross generation capacity(228.85 MW) test on 9 January 2009
[46]	Appraisal note of ICICI bank dated
[47]	Amendment letter from Govt of A.P. for supply of gas dated 20 May 2008
[48]	Amendment letter from Govt of A.P. for supply of gas dated 24 May 2008
[49]	Amendment letter between Eastern Power Distribution Co. of A.P. and Southern Power Distribution Co.of A.P. and Northern Power Distribution Co. of A.P. and GVK Industries Ltd dated 26 May 2008
[50]	Coal price notification from Singareni Collieries Co. Ltd dated 9 April 2001
[51]	Provisional power bills from GVK to APPCC for the period 10 December 2010 to 10 January 2011 dated 11January 2011

[52]	GAIL transportation invoice dated 15 December 2010 and 31 December 2010
[53]	APPCB renewal consent and authorization order dated 7 January 2010
[54]	Minutes of Meeting (MoM) of clean development mechanism(CDM) local stakeholders on 1 December 2007
[55]	Reliance press release dated 22 January 2010
[56]	Industrial Development Finance Corporation(IDFC) Due Diligence letter dated 7 May 2010
[57]	Common loan agreement dated 20 November 2003
[58]	Calibration certificate of static energy meter.
[59]	Training certificate of Gopala Krishna A of GVK Industries Ltd by Alstom(Switzerland) Ltd
[60]	Joint calibration report of Gas flow meter dated 4 November 2010
[61]	Calibration certificate of Turbine gas flow meter by Fluid Control Research Institute dated 1 December 2008
[62]	Energy Meter calibration certificate by Electronics Test and Development Centre(ETDC) of line -1 dated 14 December 2010
[63]	Energy Meter calibration certificate by Electronics Test and Development Centre(ETDC) of line -2 dated 14 December 2010
[64]	PPA amendment letter from GAIL dated 25 September 2001
[65]	PPA amendment letter from GAIL dated 30 January 2003
[66]	PPA amendment letter from GAIL dated 19 June 2004
[67]	VCS Project description (PD) dated 15 January 2011(version 1), Feb 2011(version 2),10 March 2011 (version 3) and 31 march 2011 (version 04)
[68]	VER spreadsheet dated 15 January 2011(version 1), Feb 2011(version 2) and 10 March 2011 (version 3)
[69]	Financial calculation sheet for Gas Model dated 15 January 2011(version 1), Feb 2011(version 2) and 10 March 2011 (version 3)
[70]	Financial calculation sheet for Coal Model dated 15 January 2011(version 1), Feb 2011(version 2) and 10 March 2011 (version 3)
[71]	CO_2 Baseline database for Indian Power sector version 5.0 of November 2009
[72]	Tool for demonstration and assessment of additionality version 5.2 Annex 10,EB 39
[73]	Tool to calculate the emission factor for an electricity system Annex 14 ,EB 50
[74]	Baseline methodology for "Grid connected Electricity Generation plants using Natural Gas" AM0029 version 03 EB 39
[75]	CDM validation and verification manual (VVM) version 01.2 Annex-1,EB 55
[76]	Industrial Development Bank of India letter of intent for application for financial assistance dated 4 May 2001
[77]	Boiler Testing Certificate for AP-4011 dated 9 July 2010
[78]	Boiler Testing Certificate for AP-4012 dated 9 July 2010

[79]	Boiler Testing Certificate for AP-4013 dated 9 July 2010
[80]	Contractual Guarantee by Alstom Switzerland Ltd
[81]	Central Electricity Regulation Committee (CERC) tariff notification dated 26 March 2001
[82]	Taxmann's Direct Taxes Ready Reckoner by Vinod and Jewan Singhania for the assessment year 2010-11 and 2011-12
[83]	Log of emergency with regard to Chlorine Mock drill conducted on 30 December 2008
[84]	Log of emergency with regard to Chlorine Mock drill conducted on 9 December 2009
[85]	Natural gas Futures Prices (NYMEX) for the period of February 1994 to Jan 2004.
[86]	Notice to proceed to Alstom Projects (I) Ltd dated 14 January 2004
[87]	Land sale deeds dated 24 September 2003
[88]	Andhra Pradesh Electricity Regulatory Commission(APERC) letter for using RIL gas dated 23 June 2009
[89]	Handbook of Cogeneration and Combined cycle power projects
[90]	Construction details of Goindwal Sahib Power Project by GVK power
[91]	Heat Balance Diagram
[92]	Commissioning schedule of Alstom Projects EPC volume 4 (670 days from COD)
[93]	HRSG Mechanical Design data sheet by Alstom Switzerland Ltd
[94]	Central Electricity Authority(CEA) performance review of Gas turbine plants for the year 2006-07 and 2007-08
[95]	Training certificate of K.M.Lingeswara Rao by Alstom projects dated 7 September 2006
[96]	Calibration certificate of turbine flow meter dated 1 December 2008
[97]	Cash Reserve Ratio(CRR) and Prime Lending Rate(PLR) for 2008 and 2009
[98]	GAIL Invoice dated 30 April 2009
[99]	GAIL Gas Chromatograph readings
[100]	GAIL transportation invoice dated 31 December 2010
[101]	Power Scenario by CEA in January 2010
[102]	UNFCCC Glossary of CDM terms
[103]	UNFCCC Guidance on assessment of investment analysis version 03.1,EB 51
[104]	GVK Industries Limited Annual report for the year 2008-09
[105]	MNRE report on Biomass Power and Cogeneration Programme
[106]	GAIL invoice dated 30 April 2009

Web-links reviewed:

[01]	www.gvk.com
[02]	www.netl.doe.gov
[03]	www.naturalgas.org
[04]	www.powermin.nic.in
[05]	www.cea.nic.in
[06]	www.energymanagertraining.com
[07]	www.iea.org
[08]	www.cercind.gov.in
[09]	www.benetechusa.com
[10]	www.indiaenergyportal.org
[11]	www.adb.com
[12]	www.mnes.nic.in
[13]	www.capitalmarket.com
[14]	en.wikipedia.org
[15]	www.manipurpower.nic.in
[16]	www.goliath.ecnext.com
[17]	www.ercap.org
[18]	www.nedcap.org
[19]	www.sourcewatch.org
[20]	www.petroleum.nic.in
[21]	www.infraline.com
[22]	www.apind.gov.in
[23]	www.pwc.com
[24]	www.asian-power.com
[25]	www.gmrgroup.in
[26]	www.ril.com
[27]	www.petronetlng.com
[28]	www.reuters.com
[29]	www.gailonline.com
[30]	www.hinduonnet.com
[31]	www.petrofed.winwinhosting.net

APPENDIX II

Resolution of Corrective Action and Clarification Requests: - "*Combined cycle natural gas based grid connected power plant at Jegurupadu, India*"

Draft report clarification requests and corrective action requests by validation team	**Ref. To the section of the PD**	**Summary of project owner response**	**Validation team conclusion**
CL-1 Description of project: i. As per VCS guidelines, PP is supposed to follow the standard PD template available on the VCS website. PP has removed section 2.5"Demonstration & assessment of methodology", section 4.3 "Quantifying GHG emissions and/or removals for the project", section 4.4" Quantifying GHG emission reductions and removal enhancements for the GHG project" & section 5 "Environmental impact". Include the same in the PD.	1.1,1.2,1.3, 1.4,1.5,1.6, 1.7,1.8,1.9, 1.10,1.14,1. 15,1.16	i) PP has followed VCS PD template from www.v-c-s.org/docs/VCS%20PD.doc and no such sections has been removed from the PD. Assessment of methodology is covered in Section 2.2 (2.2 Justification of the choice of the methodology …). The sections 4.3. 4.4 and 5 have been included in the revised PD. The sections 2.5 and 4.4 are included in the revised PD.	i.) PP has removed section 2.5 which describes assessment & demonstration of additionality as per latest PD template available on VCS website. PP to include section 2.5 in the PD Section 4.4 is still missing in the PD. PP to include section 4.4. The issue is not closed PJRCDM 3rd Response Sections 2.5 and 4.4 are included in the PD. The issue is closed.
ii. As stated in the PD to achieve the project		ii) The consent to operate from APSEB	ii.) Consent to operate &

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
commissioning within the normal stipulated period in the PPA, PP has to provide consent to operate, consent to establish, Project commissioning certificate & EPC contract copy. Provide consent to operate & commissioning certificate		and commissioning certificate (same as the issue of project COD) from Andhra Pradesh Power Coordination Committee has been submitted (attachment No. 3 and 13 in CD sent). The commissioning date in the revised PD is updated to 14/04/2009. The consent to establish is attached (Att. 1)	commissioning certificate is made available. But the date mentioned in the PD as 5 June 2009 is not matching with the COD date in the commissioning certificate. Rectify the date accordingly. Consent to establish is not provided. This issue is not closed. PJRCDM 3rd response The commissioning date is revised to 14/04/2009 in the PD. The consent to establish is now provided. The issue is closed
iii. As per VCS guidelines project location must include the geographic & physical information of the project site. Description in the PD does not mention the "state" where the project activity takes place. Provide the details of the "state" of geographic location of project activity.		iii) The state (Andhra Pradesh) of the project activity location is now specified in the Section 1.5 of revised PD.	iii) The state (Andhra Pradesh) of the project activity is now mentioned in the section 1.5 of revised PD. Issue is closed.
iv. Estimation of annual emission reductions in tonnes of CO2e for the year 2009 in the PD		iv) Considering COD in mid April, a proportionate ER estimate for 3.5 months	iv.) Emission reductions for the year 2019 are over-estimated.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
are 628784 which are consistent with the emission reductions in the subsequent years. Since first 4 months of the year 2009 are already over, this estimation is overrated. Re-estimate the emission reductions for 2009.		is reduced from 2009 and shifted to 2019 (to use complete 10 years first crediting period) in Section 1.6 of the revised PD. The emission reduction estimate for 2019 is corrected in the revised PD.	Please re-estimate. Correction is required. The issue is open. PJRCDM 3rd response The emission reduction estimate for 2019 is now corrected in the revised PD. The issue is closed.
v. PD states that in the absence of the project activity the project proponent would have opted for a coal based power plant as described in the section B.4 Section B.4 is not traceable. Include the same in the PD.		v) The sentence in revised PD is now corrected to 'section 2.4 of the PD'. Section 2.4 has already been included in the PD and presents the baseline and its development and demonstration of Additionality. The response is corrected now.	v)Response provided by PP is not correct.Pl recheck Issue is open. PJRCDM 3rd response The sentence in the PD is now corrected. The issue is closed.
vi. PD states that the exhaust gas from the turbine is sent to HRSG (Heat Recovery System Generator)It should be steam generator & not the system generator. Correct the word accordingly.		vi) The correction is made in Section 1.9 (pg. 6) of the revised PD.	vi) The word correction is made in section 1.9 of the PD. Issue is closed
vii. PD states that the project activity provided direct employment to about 525 persons		vii) The construction of the project activity was in scope of EPC contractor. Thus,	vii) Issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
during the construction and 125 during the normal operation. In addition it is expected that up to 30 persons. Provide evidence proof.		construction related employment generation claim is removed from the PD. A list of employees presently working in operations is attached (Att. 2). The sentence in PD is also modified.	PJRCDM 3rd response Section 1.16 is now modified. List of employees presently working in the operations is also attached. The issue is closed.
viii. Pre Project Scenario The project activity is a new, independent natural gas based power plant and thus no power generating equipment existed in the project site before the project activity plant. Although the project activity is new but this is claimed an expansion project of earlier project (Phase-I). Clarify how an expansion activity be referred as new activity.		viii) As can be seen from the PPA (dt. 18/06/2003), the project history includes a decision to implement a NG CCPP in two phases (refer clause 2 of PPA). A part of this allotted 400 MW capacity in 1992 was implemented as phase I project. Later, all approvals were processed fresh (EIA study, DPR, MOEF Environmental Clearance, EPC contract and financial closure) and a new PPA was signed in June 2003. Under this new EPC contract a new power plant is constructed that includes new energy generating equipments (gas turbine, HRSG, steam turbine). The two plants run independent of each other and do not share any common energy generating units. Thus, the project activity plant is a new (power plant) activity.	viii.)Although the equipments in the project activity are new, but the project is referred as an expansion project in the PPA. So how can an expansion activity mentioned as a new, independent activity. The reference of AMS I-D is irrelevant. The issue is open PJRCDM 3rd response In section 1.4 PD refers this project as a new & independent natural gas based power plant. Although the project is referred as an expansion project, the present project activity is independent of the earlier project activity. So the term “expansion”

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		The reference to AMS I.D is removed now. The pre-project scenario involving a NGCCPP in the premises of project activity plant is discussed now in the revised PD. The gas allocation to this project was made on 08/07/1999 and later MOEF environmental clearance on 02/11/2000 was awarded based on duel fuel capacity (refer clause vi – use of naphtha…). The APSEB Consent for Establishment on 20/04/2000 has also specified duel fuel capacity. Thus, the statutory clearances are only extended validity (from exiting clearance) to 100% gas based operations. It is already mentioned in the PD that PP has TEC approval given by CEA for naphtha based combined cycle power plant in 1996. Please refer PD page no. 4 last para.	is only used to differentiate the two projects with a common consent to operate. All new equipments are installed in the present project activity & no equipments are shared with the earlier existing project. But in the revised PD, it is mentioned that the approval was given for naphtha based combined cycle power plant in 1996. The present activity is purely natural gas based. PP needs to clarify the same. The issue is open. PJRCDM 4th response PP needs to revise the PD which states that the approval was given for naphtha based combined cycle power plant in 1996. PP needs to make the correction in the PD. PJRCDM 5th response: The justification provided is acceptable.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
ix. As per VCS guidelines, the initial training of the employees for the operation and maintenance has taken place as part of the EPC. Provide training certificates of all the persons.		ix) A training certificates for Mr. Gopala Krishna A. and Mr. KM Lingeswara Rao have been submitted to DOE. Other employees were trained at the power plant as part EPC hand over (Refer EPC Contract, Vol. 4, Section Appendix S: Training Schedule) and not specific certificate is provided for the same.	The issue is closed. ix.)Training schedule is not traceable in the EPC Contract Volume 4. Pl provide training certificates of all the persons The issue is open. PJRCDM 3rd response PP has provided training certificates of two persons & other employees were trained at the power plant. The issue is closed.
x. With reference to page 4 section 1.2 it is mentioned that the Project is focusing exclusively on emissions reductions of CO2. This sentence looks incomplete.Pl. check and complete the sentence		x. The sentence is modified to 'project is focusing on emissions reductions of CO2 and CH4 …'. CH4 is included in the leakage emission from project and fugitive emission in baseline.	x) The appropriate correction is done in the sentence. Issue is closed
xi. PD states in Section 1.3 that the estimated GHG emission reductions for the project activity are 628,784 tonnes of CO2 per annum. PP is required to say whether the project is a micro project or mega project. In addition to		xi) The category of project is specified now in Section 1.3 as 'project' (as it falls between micro and mega limits). The length of the crediting period is already specified as 10 years with renewal once. The estimated emission reduction in	xi.)The category of project is rightly specified as project. The length of the crediting period is mentioned as 10 yrs with renewal of one time. The

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
that, PP is also required to state the length of the crediting period and then state the estimated emissions reductions during that period.		the crediting period is also specified.	estimated emission reductions are also mentioned. The issue is closed.
xii. In section 1.4 PD refers higher efficiency of combustion turbines of larger size Needs to add the efficiency of the turbine used in the project and justify the statement provided here.		xii) The sentence has been removed from the PD. The sentence was generic – higher GT will have more combustion gas that can be utilized in the HRGS- ST to get higher efficiency. The sentence is retained and justification is now provided citing a public available book as reference (Att. 3).	xii) PP is required to provide a relevant justification to the statement provided in the PD.PP need not delete the statement from the PD. The issue is open. PJRCDM 3rd response Proper justification is now provided in the revised PD . The issue is closed
xiii. In section 1.4 PD states shorter implementation period of the power project. PJRCDM suggests to include the implementation time taken for the proposed project & justify the meaning of shorter implementation time		xiii) This sentence is removed from the PD. The construction period of gas power plant is 24 months and that of a typical coal based power plant is four years. Please refer the title of PPA of the project activity where it is categorised as '… short gestation gas based…' The sentence is revised for clarity that 'shorter implementation period compared to a coal based power plant'. The PP had	xiii) The sentence is removed from the PD. PD needs to provide justification for the comparison of the power plant. PP needs to provide suitable evidence for the implementation period, The issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		taken up development of a coal based power plant a three year construction period was envisaged for its development (Att. 4)	PJRCDM 3rd response PP has provided evidence of coal based power plant & the justification is acceptable. The issue is closed
xiv. The heat content of the exhaust gas from the combustion turbine would be recovered in a triple pressure heat recovery steam generator Pl state the exhaust gas temperature in the PD & mention how much heat is recovered in the Steam turbine. Provide evidence proof		xiv) The exhaust gas temperature of GT from a public report is given in PD, Section 1.9 and the increased efficiency is also estimated (based on technical parameters) due to heat recovery i.e. combined cycle operations. A heat balance diagram of the plant is submitted (Att. 5) and heat reovered in HRSG (MJ/s) is mention in the PD, Section 1.9.	xiv) PP has not mentioned the amount of heat recovered in the existing turbine. Provide evidence proof for the same. The issue is open. PJRCDM 3rd response The heat balance diagram is now submitted & heat recovered is mentioned in section 1.9 in the PD. The issue is closed.
xv. The EPC contract is entered into with Alstom (Switzerland) and Alstom Projects India Limited Pl state the normal period as considered in the PPA for the proposed project, EPC date & Purchase orders of all equipments.		xv) As per PPA clause 54, pg. 13 – the scheduled completion date is 27 months from signing of agreement. The term of PPA (pg. 31, clause 6.1) is for 15 years from Project COD. EPC contract was signed in June 2003. There is no separate purchase order as the scope of EPC included complete plant	xv)Scheduled completion date as per PPA is mentioned as 27 months. But the schedule completion date as per EPC is not mentioned. PP needs to mention this date in the PD. The issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		construction. The schedule completion date as per EPC is included in the revised PD, Section 1.9 (Att. 6).	PJRCDM 3rd response The schedule completion date as per EPC is included in the revised PD in section 1.9 The issue is closed
xvi. Abbreviations used such as HP,IP,LP in the PD Section 1.4 Pl expand when used first time and pl follow the same with other abbreviations used in the PD.		xvi) The said abbreviations are explained at the first use.	xvi)Abbreviations such as HP,LP,IP are expanded in the section 1.4 The issue is closed.
xvii. Reduction of greenhouse gas emissions: PD states that by displacing the equivalent amount of electricity generation through the operation of existing fuel mix grid comprising mainly fossil fuel based power plants and future capacity expansions connected to the southern grid of India. PP is required to reword the above keeping in mind the baseline scenario selected for the project and also keeping in mind the discussion provided under "Baseline emissions" in AM0029		xvii) The approach chosen by baseline methodology is 'Selected approach from paragraph 48 of the CDM modalities and procedures "Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment". As the Additionality of the project activity is demonstrated with a coal based power plant, the referred sentence may be considered appropriate. Further, the baseline calculations are done as per three options and all are related to the emission factor of grid or the baseline technology. The discussion in revised PD is now	xvii) Justification provided is not in line with the baseline scenario & baseline emissions as per methodology. PP is further requested to provide appropriate correction in the statement made keeping in mind the baseline scenario selected for the project and also keeping in mind the discussion provided under "Baseline emissions" in approved methodology. The issue is open. PJRCDM 3rd response

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xviii. In section 1.6 the commissioning date for the project activity is 14/04/2009. During the site visit, PJRCDM verified that testing was done in 2006 while the commissioning was done on 2009. PP is required to explain the delay in starting the plant.		modified in line with the baseline emissions and Additionality both. xviii) After plant tests, the gas supply had not started due to the delay in infrastructure. A news article in 2007 has covered this issue and unavailability of rigs for drilling operations (http://www.thehindubusinessline.com/2007/02/13/stories/2007021303260300.htm). Earlier, in late 2005 GAIL and ONGC were questioned by APERC for non supply of gas (http://www.hindu.com/2005/11/06/stories/2005110615810100.htm; http://www.hindu.com/2005/12/09/stories/2005120913580400.htm). Further, APERC approved the use of RIL gas (Att. 7) for the project activity. The use of GAIL infrastructure for RIL gas supply is also mentioned in the revised PDD.	1 Response given in the revised PD is acceptable. The issue is closed xviii) The initial gas supply agreement was done with GAIL. Reliance came into picture much later on 17 April 2009.The delay is referred to the period of 2006 to 2009.Thus the explanation does not suffice the query. PD has not clearly mentioned that Reliance gas would be supplied through GAIL infrastructure. The issue is open PJRCDM 3rd response: PJRCDM has reviewed the different new articles stating about the non-supply of the gas either from the Reliance or GAIL/ONGC. However, PJRCDM would like to have some communication/decision from GVK's management end: - wherein the delay in starting

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		There was no official communication from GAIL regarding delay in gas supply. As signing fuel supply agreements (FSA) is in the purview of management, no separate decision was recorded before signing the FSA with RIL. There is no such separate management decision to cancel the agreement with GAIL and enter fresh agreement with RIL. GVK's annual report 2008-09 which includes the issue related to the delay in starting the commercial operation due the inadequate gas supply for Jagarupadu Phase II project. After that from April 2009 company has been sourcing gas from Reliance Industries Limited (RIL) for this project. The extracts from the report are	the commercial operation of the project because of non-supply of gas was discussed and approved. - Since the gas supply agreement with GAIL was already in place during year 2005, GAIL must have communicated regarding the non-supply of gas to GVK. The same communication needs to be provided to PJRCDM for review. - Management decision to enter into a fresh agreement with Reliance needs to be provided for review. The issue is open PJRCDM 4th response PJRCDM needs to confirm any communication between GAIL and the PP regarding the delay in supply of the natural gas. Without that it is difficult to confirm that GAIL was responsible for the delay. Only after GAIL's delay PP was forced to make a fresh agreement with Reliance for supply of gas.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		reproduced below: Pg. Nos below refer to page in pdf file (different from actual pg no. of the report). Pg. 29, para 2 During the financial year 2008-09, Jegurupadu Phase II remained stranded due to non-availability of gas and incurred cost overrun mainly on account of interest during construction, insurance and preservation costs. Consequent to the supply of gas from Reliance, Phase-II has started its commercial operations from April 14, 2009 and is currently running at full capacity. Pg.30- 31,last para The company sources its current gas requirement from GAIL for Jegurupadu Phase 1, and the supply hasn't been adequate. With the expected start up of production from Krishna-Godavari - D6 Gas fields the company has been sourcing gas from Reliance industries Limited (RIL) from April 2009 for Jegurupadu Phase II	For a project of this magnitude some management decision must have been taken to cancel the agreement with GAIL & enter for a fresh agreement with RIL before actual going in the agreement deal. PJRCDM would like to review the management decision on the same. The issue is open. PJRCDM 5th response: The justification provided is acceptable. It can now be established that delay of supply of gas from GAIL & new gas sale agreement with Reliance was well documented in the Annual report of the year 2008-09. The issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		and Gautami power projects. Gas availability for the existing plant will also improve with the KG Basin gas flowing. Your Company had entered into an arrangement with RIL for the supply of 0.18 standard cubic meters of gas per day for Jegurupadu Phase 1, 1.1 million standard cubic meters of gas per day for Jegurupadu Phase II, and 1.96 million standard cubic meters for Gautami Power Limited. In April of 2009, Jegurupadu commenced operations and in June Gautami commenced operations. At present, gas requirements for Jegurupadu Phase 2 and Gautami are being received in full from RIL. PP has submitted the GVK's annual report 2008-09 to DOE	
xix. In section 1.6, PD states crediting period of 10 years with a renewal of one time. PP is required to justify the selected crediting period keeping in mind the lifetime of the equipments which is stated as 15 years.		xix) The crediting period can be 10 years with twice renewable. As the five years of technical life will be available in the second crediting period, once renewal of crediting period is chosen.	xix) The crediting period is mentioned as 10 yrs with one time renewal. PP needs to mention that the 5 yrs of remaining technical life of the

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		The justification of using only the remaining life in the 2nd crediting period is given in Section 1.6 of the revised PD.	power plant will be considered during second crediting period in the PD. The issue is open. PJRCDM 3rd response Proper justification is provided in the PD. The issue is closed.
xx. In section 1.7 PD states since the project activity is a greenfield project, no energy generation units existed at the project activity site in the pre-project scenario PP needs to justify the above statement keeping in mind the already existing NG based power generation unit at the plant premises. PP needs to demonstrate that the proposed project is independent of the existing NG based power generation unit at the plant premises commissioned in year 1996-98.		xx) Please refer to response for CL1 point (viii) above. The nameplates for GT and ST (attached) show manufacturing year as 2004 showing main energy generating units were purchased new from OEM - Alstom. The sentence has been deleted and a realistic justification is given to refer to existing independent NG CCPP unit.	xx) PP has clearly demonstrated that the project activity is independent from the existing activity. Although this is a Greenfield project but energy generation units already existed at the site from 1996. PP needs to reword the sentence & eliminate "no energy generation units existed at the project activity site in the pre-project scenario" The issue is open. PJRCDM 3rd response In section 1.7, PD refers this project as a greenfield natural gas based power plant. The

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			present project activity is independent of the earlier project activity. All new equipments are installed in the present project activity & no equipments are shared with the earlier existing project of 1996-98. Issue is closed
xxi. In section 1.8 PD states that in the absence of the project activity the project proponent would have opted for a coal based power plant.		xxi) The Additionality of the project activity is demonstrated using a baseline alternative – Power generation using coal as the energy source (Refer section 2.4 of PD).	xxi) PD has corrected the section as 2.4 which refers to the additionality of the project. The issue is closed
xxii. PP needs to be consistent in stating "what would have happened in the absence of project activity". At some places in the PD, PP is discussing the grid mix and at other places, PP is discussing coal based.		xxii) The emission reduction calculation of the project uses emission factor (build margin of grid) and the Additionality is demonstrated in comparison to a coal based power plant. Thus, both scenarios are discussed at appropriate places. The PP could have chosen a coal based power plant to get same level and output of services (to sale to grid). However, conservatively, as per the baseline methodology, the build margin emission	xxii) PP needs to be consistent saying" what would have happened in absence of project activity". Since the baseline used is coal based power plant, PP needs to mention this scenario at all places in the PD.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		factor is used for emission reduction calculation suggesting displacement of electricity generated using fuel mix in the grid. The PD is updated as per, including justification in the Section 6. The footnote is now given in the PD wherever reference to generic statement on what PP would have done is coming. The response is corrected now.	The issue is open PJRCDM 3rd response Footnote 45 provided in Section 6 is acceptable. PP to incorporate the same justification in the PD The issue is open. PJRCDM 4th response Justification given is acceptable. But the justification needs to be corrected in the PD not PDD as stated. PP to make this correction in the response. The issue is open. PJRCDM 5th response: The response is acceptable. The issue is closed
xxiii. The nameplate capacities of the turbine generators are – 210,000 kVA and 0.8 power factor for GT and 110,000 kVA and power factor = 0.8. Pl include equivalent MW capacity of both		xxiii) The capacity is MW as per nameplate is specified in Section 1.9 of the revised PD. The nameplates are provided in new	xxiii) The capacity in MW as per nameplate is mentioned in section 1.9 of the PD. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
the turbines. Provide name plate details photos. Photos provided earlier are not readable. Pl provide the readable photo copies xxiv. The PPA capacity is 220 MW and EPC design is 228 MW. During the commissioning test approved by Andhra Pradesh Power Coordination Committee (dt. 14/04/2009), the gross generation capacity in the test was demonstrated as 231.98 MW PP is required to include a table in the PD showing the different capacities as per different documents i.e. name plate capacity, PPA, EPC design and also the final APPCC test report and also add the reason for the difference in the capacities. In other words, PP is required to justify capacity of the project as stated in the PD i.e. 228 MW.		readable photos. xxiv) The EPC contract was signed for 228 MW (refer cover page of ECPC contract) and this is also a guaranteed output by the EPC contractor (refer attachment). The Gross Generation Capacity observed in a standard capacity test in July 2009 was also found 228.85 MW (evidence submitted already). A Table of the capacities in these documents is given in Section 1.9 of revised PD and a justification for use of 228 MW as capacity in overall document is provided. The nameplate capacity is now included in the Table (Section 1.9, Pg. 7). Also, a justification is provided for the different capacities. The unit of capacity is provided for each of the values now. The justification is further given based on	xxiv) The gross generation capacity as mentioned in the letter of APPCC on issue of COD states 228.85 MW. PP has not included the nameplate capacity in the Table added in the PD. PP to add name plate capacity in the Table provided in the PD. Also the justification provided does not make clear why the capacities are different in nameplate, EPC, PPA. PP needs to further justify. The issue is open PJRCDM 3rd response Although PP has included the nameplate capacity but the unit of capacity is missing. Table needs to include unit for every capacity. In addition to above, PP is also required to include the

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		228 MW on how the financial analysis and emission reduction calculation will be conservative for this capacity. The correction is made in the PD page no 8. Please note that rating is given in kVA (TG = 210,000 and ST = 110,000 kVA) and is converted using power factor to get capacity in MW.	justification for the capacity (228 MW) of the project under consideration keeping in mind those different documents states different capacities. The issue is open. PJRCDM 4th response On page no 8 of revised PD dated 22 March in section 1.9 it states that the name plate capacity by the supplier converted from rating is kVA of 256. It should be corrected to MVA of 256 in the PD.PP also needs to provide the power factor provided on the nameplate in the PD. The issue is open PJRCDM 5th response: The required correction is done in the PD. The issue is closed.
xxv. Provide evidence for plant load factor, heat rate of the plant		xxv) The PLF and heat rate is taken from Detailed Appraisal Memorandum by bank,	xxv) The evidence proof for PLF provided is OK. But the heat rate

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		2001. pg. 30 (pg. 15 of pdf file - IDBI LoI and Appraisal Memo- May 2001). This was lenders document for appraisal considered in 2001. Heat rate is also evident from PPA dt. 18/06/2003; pg.13, clause 57. The VER sheet has converted heat rate on NCV basis to 1682 kcal/kWh. The heat rate from PPA is used in the PD and that from EPC contract is also stated in the section 1.9 of the revised PD. As EPC heat rate is lower, this will translate in lower gas consumption and hence higher VER estimate. Thus, as a conservative approach, PPA based heat rate is retained in PD for the ER calculation. In any case, the gas consumption will not be calculated based on heat rate in the monitoring, but measured actually. Thus, this will not result in overestimation of the VERs. The NCV is now changed to GAIL invoice for the commissioning date (14/04/2009). Hence, the CER calculation is also updated in the PD.	value as per evidence proof provided states the value as 1850 as per PPA & 1810 as per EPC. PP needs to clearly state the reference value of heat rate in the PD. Also the same value to be used in the VER excel sheet. The value of 1682 kcal/kWh is used in VER excel sheet which is not in line with any of the evidence proof values. PP needs to clarify the issue The issue is open. PJRCDM 3rd response Heat rate used is in line with the methodology. But the source data of NCV used in the ER spreadsheet needs to be provided. The issue is open. PJRCDM 4th response PP needs to provide the NCV source from the supplier end as well as from the user end.PP needs to use the most

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		The monitoring table is updated to choose suppliers meter as main meter and PP's meter as check meter (in line with fuel supply agreement). In case of difference in the two meters, the emergency plan as described in the section 3.4 of PD will be followed to get the most conservative value – lowest NCV value. Weighted average NCV for the first 15 days of gas supply from COD is computed and use for the CER as well as financial calculation is used.	conservative value for the calculations. PP has referred a single value. Averaging out of NCV is required for the calculations as done for gas price in the financial part. CER calculations also need to be reworked. The calculations are overestimated. The issue is open PJRCDM 5th response: Averaging out of NCV is done & CER calculations are revised. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xxvi. The gas supply agreement with the Gas Authority of India Ltd. (GAIL) is signed for supply of 1.10 million SCM gas During the site visit, PJRCDM observed that the gas supply contract is with Reliance through GAIL's infrastructure. However, the PD as well as the financial sheet is stating that the gas supply contract is with GAIL. PP needs to clarify the same and revise the PD and financial excel sheet accordingly.		xxvi) The gas rate for GAIL supply is fixed under GoI Administered Price Mechanism. The new source Reliance is market linked price and substantially higher. Hence, as conservative approach, GAIL price is used for the financial analysis. The investment analysis is now done based on the actual invoice from GAIL for RIL gas in the month of project commissioning. The use of GAIL infrastructure for supplof RIL has is also consistently mentioned in the revised PDD.	xxvi) PP needs to clearly state that the GAIL contract for supply of gas is no longer valid & hereafter Reliance will supply the natural gas. Difference in the prices of natural gas needs to be clearly stated & justified in the PD. PP needs to clearly state which values are used in the financial excel sheet. The issue is open. PJRCDM 3rd response Justification which states GAIL infrastructure is used for supply of Reliance has to be consistent in the PD. The issue is open. PJRCDM 4th response Response provided is acceptable. The issue is closed.
xxvii. The monitoring for the project activity constitutes the electricity exported. PP should clearly state if it is net or gross in section 1.9 of the PD.		xxvii) The net export is monitored and corrected as per in Section 1.9 of PD.	xxvii)PP has clearly stated net export in section 1.9 of PD The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xxviii. The electricity exported in measure at the dispatch sub-station by two separate meters Pl check & correct.Pl state clearly the meaning of "measure" here.		xxviii) The sentence is corrected to 'The net electricity exported is measured …'	xxviii) The sentence is corrected to net electricity. The issue is closed
xxix. In section 1.10, the project proponent however has obtained the necessary approvals from state electricity board.		xxix) The sentence is corrected and also a list of all applicable clearance is summarised in section 1.10 of PD. DOE is already given copy of these documents.	xxix) The sentence is corrected & list of all applicable clearance is summarised in section 1.10 of PD. The issue is closed
xxx. As discussed during the site visit, PP is required to state all the laws and regulations applicable to the proposed project and against each of them, mention the compliance status. The evidences need to be provided to PJRCDM. In section 1.14, PP is required to add the discussion regarding the CDM validation of the project and state the present status of the project. PP is also required to include the link to the webhosted PDD on UNFCCC website		xxx) A summarised in section 1.10 of PD. DOE is already given copy of these documents. Section 1.14 has been updated to include CDM status and link to web hosted PDD for CDM- global stakeholder comments. The table is updated to give compliance status and dates of all the clearances in the revised PD. Ver. 3.	xxx) PP has not summarised all the applicable laws & regulations in section 1.10 of PD regarding compliance status & date. A link to update the CDM status is provided in the PD. The issue is open. PJRCDM 3rd response Though the applicable laws & regulations are stated in section 1.10 of PD, however, for some

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xxxi. Provide Testing certificates of all equipments		xxxi) Following calibration certificates are submitted to DOE 1) Joint calibration report for gas flow meters with GAIL 2) third party lab calibration for gas flow meter (check meter) 3) Government lab calibration reports for electricity meters (both line 1 and 2) 1. The model number of supplier's gas flow meter (GAIL) was not recorded properly. However, the make (Daniel) and a sr. no. 080695 are matching in the photo and calibration certificate. 2. Line 2 meter calibration certificate is	of them the compliance status & date is missing. Please include the same in the VCS PD. A link to update the CDM status is provided in the PD in section 1.14 . The issue is open. PJRCDM 4 th response The table in section 1.10 in the revised PD is updated. The issue is closed xxxi) 1) Model number of the Gas flow meter in the photo & certificate provided do not match. 2) Third party calibration certificate only gives the calibration date as "01.12.2008". But the validity of certificate is not mentioned on the certificate. Also electricity meter certificate is only made available for line-1.PP to provide line -2 certificate PP to provide testing certificates of all other equipments.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		attached. Please refer calibration certificate (file named 'GAIL gas flow meters JOINT CALIBRATION REPORT' Column 2, row 11). This shows Sr. No. 080695. An extract of this page of the certificate highlighting this serial no. is attached.	The issue is open PJRCDM 3rd response Response provided is not matching with the support document provided. The sr. no. 080695 could not found in the calibration certificate. Line no.2 calibration certificate is now provided. The issue is open. PJRCDM 4th response Reference given is not correct.Sr.No.as mentioned could not be found in the calibration certificate. The issue is open PJRCDM 5th response: The response provided is acceptable. The issue is closed.
xxxii. Provide Boiler testing certificate		xxxii) Boiler test certificate by AP Boiler Inspection Department is attached. The HRSG (all three stages HP, IP and LP) safe operating pressures are given in the	xxxii) Boiler test certificate only mentions the maximum pressure of the Boiler. But it does not mention the safe operating

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		PD, section 1.9. The reference from the design data sheets is attached (Att. 7)	pressure of the boilers. PP needs to mention safe operating pressure of all the boilers in the PD. The issue is open. PJRCDM 3rd response PP has included the maximum operating pressures of the heat recovery boiler in all 3 stages. The issue is closed
CL 2: Applicability of the methodology: a) Please justify how the proposed project i.e. 228 MW NG based power generation can be considered as a new Greenfield project keeping in mind already existing NG based power generation unit at plant premises which was commissioned in year 1996-98 and the proposed project being referred as expansion project (phase II) of the existing plant.	2.2,2.3,2.4	a) Please refer to response under CL-1, query (viii). The justification is provided for the new, independent power plant under the project activity and reference is also made to the existing power plant.	a) Referring to the response under CL-1, further justification is to be provided to prove that this is a new & not expansion project activity. The issue is open. PJRCDM 3rd response The justification provided is acceptable. Issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
b) PJRCDM reviewed the Attachment 1 – Gas availability document and observed the following: PP is requested to clarify the following: 1) PP has given reference to already registered CDM projects like 1381, 1343 etc, including one Chinese project wherein the gas is being imported from Australia to meet the project's demand. PJRCDM agrees with the fact that the intention of the methodology is to avoid diversion of gas from non CDM/VCS projects to the potential CDM projects and we also acknowledge the fact that methodology does not restrict the region for sourcing the gas. However, while demonstrating the gas availability, PJRCDM is of the opinion, that region needs to be defined. It can either be the region where the source of gas is located and the future capacity additions are considered in that region or it can be the region where the project is hosted so that the future capacity additions in that region can be considered. Keeping the above		(b) 1) The attachment is updated to restrict region to the state i.e. Andhra Pradesh	b) The region "Andhra Pradesh" is added in the attachment-1. The issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
understanding in mind, PJRCDM requests PP to justify the explanation provided in the initial section of the Attachment 1 – gas availability document. 2) PP is also requested to include this document in the VCS PD.		2) The note is included in the PD as Appendix 1. The future capacity addition of 4 times than the project activity is discussed in the Attachment 1. Also, three more projects planned are being sent now (Att. 8)	2) The document is included in the PD. The issue is closed.
3) Based on point (1) above, PP is also requested to clearly state the region selected for the proposed project activity to demonstrate the surplus availability of gas (as required by applicability condition 3 of the methodology AM0029, ver 3). Also confirm that the future capacity additions are considered in this region only.		3) The description is modified to restrict region to the state i.e. Andhra Pradesh. Future capacity addition is also referred from the same region.	3) Attachment-1 does define the future capacity additions in the state of Andhra Pradesh. The issue is closed.
4) PP has also stated that for this particular project, gas availability will be		4) Source of supply as mention in note is new discovery KG basin. This is also	4) Source of supply is mentioned in the attachment.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
demonstrated at the "source of supply". PJRCDM, as mentioned above as well, requests PP to clearly define the "source of supply".		updated in the note.	The issue is closed
5) PP is also requested to clearly define the period considered to demonstrate the surplus availability of gas. In the document provided, the period considered is at the time of EPC contract. Please justify the same.		5) The note has done initial discussion at the time of EPC contract i.e. at the time of investment decision. However, later three different phased are also discussion – (1) Management took decision (2) commissioning date (3) As on date The gas availability is discussed in terms of baseline methodology requirement i.e. non diversion from existing users and to ensure future power generation facilities of comparable size are not deprived due to NG being taken up by the project activity.	5) The justification provided is not clear. PP needs to clearly define the period considered to demonstrate the surplus availability of gas for technical lifetime of 15 yrs of the project. The issue is open. PJRCDM 3rd response The justification provided is acceptable. The issue is closed
6) Document provided for gas availability talks about the gas supply contract with GAIL while during the site visit, PJCRDM team observed that the fuel supply contract is with Reliance. PP is requested to clarify the same. Fuel supply agreement with Reliance needs		6) GAIL still acts as gas transmission agency. Copy of gas supply agreement is provided to DOE (att. 2 in CD) and this being market linked gas, there is no 'allocation' as in case of APM gas from MoPNG. The RIL gas sales and purchase (GSPA) agreement is for 1.1 million SCM/	6) PP needs to justify the meaning of marked linked gas. PP is also requested to compare the gas allocated to GVK from Reliance (gas allocation document to be provided to PJRCDM) for the project against

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
to be provided. PP is also requested to compare the gas allocated to GVK from Reliance (gas allocation document to be provided to PJRCDM) for the project against the actual gas requirement of the project.		day (Refer GSPA pg. 46 'daily contract quantity = 34,069 MMBTU/ day and NHV on pg. 48 as 30,556 BTU/ SCM. A division of 34,069 million/ 30,556 = 1.1 million SCM). This requirement as demonstrated on pg. 22 of PD is sufficient for 100% PLF operation on daily basis. The gas not covered in APM is called market linked gas (available at the market determined price). RIL GSPA is provided already to DOE (in CD – folder named '2, 23_Agreements for Reliance Gas'. The unit conversion given above shows same quantity of gas as GAIL supply agreement is contracted with RIL.	the actual gas requirement of the project in the same units. NG from Reliance is measured in MMBTU/Day & on NHV basis. The gas supply by GAIL as per original PPA signed with GAIL was in SCM/day. The issue is open. PJRCDM 3rd response Justification provided is acceptable. The issue is closed
7) It is also stated in the attachment 1 that the gas supply to the project is from a new source (not from the one which was supplying has elsewhere). PJRCDM requests PP to clarify the new source and the existing source as mentioned in the above statement. This clarification needs to be included in the attachment 1 as well.		7) The new source is referred to KG basin discovery that was discovered in 2002 (at investment decision of project activity) and started production in 2009 (at plant COD). Existing source term differentiates all 2002 operational gas sources. The proof of investment decision is EPC contract signed in 2003 and same is submitted to DOE already. The gas sources as per 05/10/1999 contract with GAIL	7) PP needs to provide evidence proof for investment decision as stated. All 2002 existing sources should be mentioned in the PD.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		(refer pg. 1 and also further amendments in 2001, 2003, 2004) were 'from the ONGC fields at Tatipaka, Parsarlapudi, Kesnappalli, Mori and other firlds of ONGC and as well from Ravva offshore fields'. Footnote 55 is now also referred on Pg. 59 to describe the existing gas sources. The response is corrected accordingly.	The issue is open. PJRCDM 3rd response Justification provided by PP is acceptable. PP to provide reference of footnote 55 on page 57 of the revised PD. The issue is open PJRCDM 4th response Footnote 55 is referred on page 59 of the revised PD PP to correct the response accordingly PJRCDM 5th response: Response provided is acceptable. The issue is closed.
8) The provided document also discuss about the priority allocation list prepared by MoP&NG. As already discussed above, PP needs to clarify if the allocation list is restricted to the "region" selected by the PP to demonstrate gas availability. Please		8) The gas allocation letter from Ministry of Petroleum & Natural Gas – GoI dt. 08/07/1999 is already presented to DOE. The complete list of allocations is not in public database but already summarised in the gas availability note from available research reports.	8) PP is requested to reword the appendix 1 clearly stating the region selected to demonstrate surplus availability, gas sources available in that region, potential of these sources, current (i.e. at 3 different stages considered by

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
provide the allocation list to PJRCDM for review.		Presently the gas is sources from RIL KG basin (refer all present invoices from COD) which started operations in 2009. The gas availability note is updated to give availability and users to demonstrate surplus in the revised PD. The appraisal report from ICICI (pg 88) has also given existing users and it is notable that the project has gas allocation on 'firm basis'. Gas availability note has already given the region as state Andhra Pradesh, source as KG basin and its potential. The para representing this is highlighted in the PD	PP) use of the gas and finally the surplus gas at each stage. The issue is open. PJRCDM 4 th response The justification provided is not correct.PP to clearly state the region for surplus availability,gas sources in the region & the potential of these current sources in the appendix-1 The issue is open PJRCDM 5th response: Justification provided is acceptable. The issue is closed.
9) Gas requirement per day for the proposed project needs to be consistently mentioned at all the places i.e. PD, attachment 1-gas availability document and the ER excel sheet. Pl check and revise accordingly.		9) In the PD and gas requirement calculation, this is referred on daily basis (1.1 SCM/day). In ER calculation, as annual value is required, it is referred in SCM (per year). VER sheet has already given daily gas requirement. The gas requirement is specified on SCM	9) In the excel sheet gas requirement on daily basis needs to be mentioned. PP needs to mention same units of consumptions at all places in the PD & excel sheet. The issue is open. PJRCDM 3rd response

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		basis in the revised PDD and VER sheet.	PP needs to mention same units of natural gas consumptions at all places in the PD & excel sheet. The issue is open PJRCDM 4th response The gas requirement is specified on SCM basis in the revised PDD and VER sheet. The issue is closed
10) From the attachment 1- gas availability document, PJRCDM is not yet able to conclude on the surplus availability of the gas in line with the applicability condition 3 of the methodology. Though document provides information regarding the future gas explorations as well as the current availability, however, the document is not very clear on the "region" selected. PP has to be consistent in discussing the availability, expected future capacity additions and needs to demonstrate the availability in line with the methodology requirement.		10) The region discussed for the gas availability demonstration is Andhra Pradesh. However, beyond the control of PP, if gas from KG basin or state is not made available, gas may also come from RIL Transmission infrastructure (a pipeline link from west coast). As East-West pipeline is available for gas in a better gas network in the country, a brief discussion on the gas availability in country as overview is also presented. It may be noted that, the KG basin gas is allow allocated to NTPC's Ratnagiri Power plant in Maharashtra.	10) Last sentence in the justification provided is not clear. PJRCDM is not yet convinced on the justification provided by the PP on the current availability of gas & surplus availability of NG for future capacity additions. PP has considered possibility of only two future capacity additions but there can be a possibility of more similar projects in the future. Justification is required as why PP has restricted itself to only these two capacity additions for

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		The applicability condition requires to ensure future power generation facilities of comparable size are not deprived due to NG being taken up by the project activity [Ref: footnote No. 2 of the AM0029, Version 3]. The PP has given future capacity addition more than four times the project activity under construction and three more projects in planning. The gas availability section is updated to give references of three power plants with capacity more than 4 times the project activity. The identified open issue is answered above.	demonstration of surplus availability of natural gas for future capacity additions and hence the provided justification is not acceptable. The issue is open PJRCDM 3rd response PJRCDM is not yet convinced on the justification provided by the PP on the current availability of gas & surplus availability of NG for future capacity additions. PP to give reference in the PD of future capacity addition of more than four times the present activity and three additional projects in the justification provided . The issue is open PJRCDM 4th response The justification provided is not acceptable.PJRCDM is not yet convinced of surplus availability of fuel in the region. The issue is open

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			PJRCDM 5th response: Justification provided in the revised PD established the fact of current & surplus availability of NG for future capacity additions in the region. The issue is closed.
CL 3: Baseline determination for the proposed project PP is required to demonstrate that all relevant power plant technologies that have been recently constructed or are under construction or are being planned have been included in identification of plausible alternative scenarios. PP needs to demonstrate the same in line with the requirement of the methodology. Issues related to the different alternatives identified:		The latest available (at validation start) CEA CO2 database for Indian Power Sector (Ver. 05) is studied analyse all relevant power plant technologies that have been recently constructed and are included in the identification of plausible alternative scenarios. No other power plant technology type than mentioned already in the PD was found. The biomass based alternative is discussed in PD page no 24.	PP is required to demonstrate that all relevant power plant technologies that have been recently constructed or are under construction or are being planned have been included in identification of plausible alternative scenarios. PP needs to demonstrate the same in line with the requirement of the methodology. The issue is open PJRCDM 4 th response Option of Power generation using Biomass is not discussed. PP to include the same in the PD The issue is open

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			PJRCDM 5th response: Biomass option is discussed in the revised PD The issue is closed.
Alternative (a) i) Under alternative (a), PP has to state VCS project in place of CDM project. Please check and correct the same. ii) PP is required to provide evidence that proposed project is to meet the base load demand of the southern regional grid of India.		(a) i) the correction is made to refer to alternative as VCS project ii) The project activity is operating at 85% annual PLF that translates in 7446 hours/ year. As per Guidance in baseline methodology ACM 0013, if a base load plant operates 3,000+ hours and hence this is evident that the plant operates in base load. Please refer to schedule F; Test Procedure of the PPA wherein standard site reference conditions for capacity test are prescribed. Here, under the list of parameter, second last parameter (Load factor) shows that the project plant is to be operated based on the 'Base Load'.	Alternative (a) i) Correction has been done as VCS instead of CDM. The issue is closed. ii) ACM 0013 mentions base load of similar plants operating in the same category. The justification provided by PP is not appropriate. PP should provide evidence that proposed project is to meet the base load demand of the southern regional grid of India. The issue is open. PJRCDM 4th response PP should provide evidence that proposed project is to meet the base load demand of the southern regional grid of India.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		Another third party study by Power Finance Corporation shows that Andhra Pradesh had about 4000 MU energy deficit. Further the report also says Southern grid of India had 8.8% energy deficit (please refer file Power Scenario in AP-PFC-Nov 2003)	The issue is open. PJRCDM 5th response: The justification provided is acceptable. The issue is closed.
Alternative (b) i) Under (b.1), PP has stated that this alternative does not deliver services/output similar to the proposed project. Please justify the statement provided.		i) The justification is updated based on CEA's guideline not to have open cycle power plants due to lower efficiency.	Alternative (b) i) The response provided to the query raised by the DOE is irrelevant as it mentions reservoir based project. PP is requested to check the response provided which does not match with (b.1) in the VCS PD. The issue is still open. PJRCDM 3rd response Justification provided in section b.1 confirms that the option selected does not deliver services/output similar to the proposed project.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
ii) PP also needs to demonstrate how this alternative can be considered as base load power plant and that it can meet the base load demand of the southern regional grid.		ii) The project activity is operating at 85% annual PLF that translates in 7446 hours/ year. As per Guidance in baseline methodology ACM 0013, if a base load plant operates 3,000+ hours and hence this is evident that the plant operates in base load. The power demand of the southern grid as per latest CEA data is given in the revised PD, pg. 18. Please refer to schedule F; Test Procedure of the PPA wherein standard site reference conditions for capacity test are prescribed. Here, under the list of parameter, second last parameter (Load factor) shows that the project plant is to be operated based on the 'Base Load'. The base load demand of the AP state where the power is distributed from the plant is also given in the Appraisal report by ICICI (pg. no. 39-41).	The issue is closed. ii) ACM 0013 mentions base load of similar plants operating in the same category. The justification provided by PP is not appropriate. PP should provide evidence that proposed project is to meet the base load demand of the southern regional grid of India. The issue is open PJRCDM 3rd response Justification provided is not acceptable. Justification is to be provided for base load. The issue is open PJRCDM 4th response PP has provided evidence for base load demand of southern regional grid. The issue is closed
iii) PP is also required to provide evidence for the lifetime of the NG based open cycle power generation unit.		iii) The evidence provided already for life of NG CCPP does not differentiate	iii) PP has provided evidence proof for the lifetime of the power plant.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		between open and combined cycle but all gas plants have same life (15 years). Thus, this footnote is provided in revised PD for life of open cycle plant alternative.	The issue is closed.
iv) Under (b.2.), PP is required to provide the details regarding the technical lifetime and capacity of the technology considered i.e. NG based cogeneration unit. In addition to that, PP needs to justify how the basis for comparison is same as the project activity.		iv) The lifetime of alternative is provided now. As cogeneration plant is used to get steam output for process heating, this is not considered to give same output as the project activity and not discussion further. The capacity (228 MW) is given now in the revised PD.	iv) PP is further requested to provide the capacity of the technology considered i.e NG based cogeneration unit. The issue is open. PJRCDM 3rd response Capacity of the alternative technology is mentioned in the revised PD. The issue is closed
v) PP also needs to confirm whether the above mentioned both the alternatives are in compliance with all the applicable legal and regulatory requirements in the region.		v) PD is updated to describe the compliance with applicable mandatory laws and regulations.	v) The compliance of the alternatives with all the legal and regulatory requirements in the region has been mentioned in the VCS PD. The issue is closed.
Alternative (c) i) Under (C.1), please mention the capacity of the coal based power plant considered under this scenario.		i) The capacity of this alternative (250 MW) is updated in the PD	Alternative (c) i) The capacity of 250 MW has been specified in the VCS PD.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			The issue is closed
ii) Also demonstrate that this alternative will provide the similar level of service i.e. would be used to meet the base load demand of the southern regional grid.		ii) The justification of same level of services is also updated in the PD. The power demand of the southern grid is mentioned in the revised PD,	ii) PP has justified that almost same amount of power would be generated through both the technologies, however it has not been justified that this alternative will provide similar level of service i.e. would be used to meet the base load demand of the southern regional grid. The issue is open PJRCDM 3rd response Revised PD states that this alternative will provide similar level of service i.e. meet the base load demand of Southern grid. The issue is closed.
iii) Under (C.5), PP needs to demonstrate how this alternative provides the similar level of service as the project activity i.e. can be used to meet the base load demand of the southern regional grid.		iii) This alternative is discussed as available and not carried forward. Diesel power plants operate in peak load requirements and this is updated in the PD.	iii) PD mentions that Diesel based power plants operate only to cater peak load demand but base load demand is not discussed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		The power demand of the southern grid is mentioned in the revised PD,	PP to mention about base load demand in the PD. PJRCDM 3rd response Base load demand is discussed in the revised PD. The issue is closed.
iv) Under (C.6.), please justify how the basis of comparison is same as the project activity. The proposed project is designed to meet the base - load demand of the southern regional grid.		iv) This is an option given in the baseline methodology AM0029 under 'Alternatives to be analysed should include, inter alia' The alternative is mentioned separately as (d) in the revised PD now.	iv) PP is requested to clarify why the option (c.6) as mentioned in PD has been included under "Power generation technologies using energy sources other than Natural Gas" section while the same has been separately mentioned as one of the four alternatives in the applied methodology AM 29 version 03. Justification provided by PP is not clear. The issue is open. PJRCDM 3rd response The alternative is mentioned separately in the revised PD. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
CL-4 Benchmark Investment Analysis: a.)Natural Gas Based: i. The basis for PLF is not transparent. Justification is sought on the methodology of PLF's used.	,2.5,2.4	i) The PLF and heat rate is taken from Detailed Appraisal Memorandum by bank, 2001. pg. 30 (pg. 15 of pdf file - IDBI LoI and Appraisal Memo- May 2001). This was lenders document for appraisal considered in 2001. The PLF in the referred report is average of three years operations PLF at Unit 1. Thus, this is representative of project activity plant as well. The heat rate for calculation of tariff in the PPA is also same 1850 (refer pg. 13) and applicable through the plant life. The phase I plant is alo prating on similar technology and supplying to same power purchaser. By considering PLF of 85% as base case and doing sensitivity of ±10%, PP has covered all the realistic range of PLF that is possible. Using higher PLF (than 80% used in the financial appraisal) will be conservative as it will decrease the financial indicator chosen for Additionality. Thus, using 85% PLF is justifiable.	i) The Appraisal Memorandum by the Bank states that the parameters are only the assumptions underlying the profitability statement, justify how the same is applicable to this project. The issue is open. Substantiate as to how PLF at Unit 1 be applicable for this project. The issue is open. The explanation is accepted and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
ii. b) Substantiate as to why the project cost is 100% debt funded without any equity component considered in the financial analysis Provide a copy of the detailed project report.		ii) The total project cost as per actual financial closure. Refer Pg. 134 (Pg. 137 of pdf file) of the Common Loan Agreement submitted already. The banks agreed to fund project cost 100% as the financial performance of parent company was good. This also confirms total project cost Rs. 7203.66 million. There is no DPR, but common loan agreement – that given actual financial closure value.	ii) The Schedule X of the common loan agreement with regard to financing plan has been verified and the issue is closed.
iii. Provide evidence for the life of the plant and machinery. As per the notification given by Ministry of Power dated 29th March 1994 the fair life of Diesel-electric and gas plant is 15 years with depreciation rate under SLM as 8.24%. Clarify for the depreciation rates considered in the analysis.		iii) The plant life is 15 years, as per said notification. Depreciation rate is 8.24 for gas plants and is updated as per in the financial model and PD revised now.	iii) The revised calculations and the PD have been verified and the issue is closed.
iv. Clarify for considering foreign debt service charges in the revenue spreadsheet in US dollar while the other parameters are in Indian rupee		iv) As per the PPA for clause No. 3.2(i) on pg. 17 – A component in the Tariff is Capacity Charge which again as a subcomponent Foreign Debt Service Charge (FDSC) = US$ 0.006. This it	iv) The PPA has been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
in the profitability statement.		towards actual foreign loan component repayment and hence in USD term. Note that the common loan agreement also has a foreign loan component.	
v. Provide a copy of fuel transmission agreement. Also state the reference for the transmission losses considered in the analysis.		v) The transmission charge of fuel is covered in gas supply agreement with GAIL, clause 4.03, pg. 17 (already submitted to DOE). There is no transmission loss considered in the analysis.	v) The gas supply agreement and the calculations have been verified and the issue is closed.
vi. The original price as per the GAIL invoice is Rs.3,070.60 per 1000 SCM plus taxes at 16%. Clarify for the considering Rs.3,731.08 per 1000 SCM with an escalation of 5% in the prices in the assumption spreadsheet. Also clarify for considering Rs.4,290.74 per 1000 SCM as the unit price of natural gas in the input spreadsheet		vi) Please refer to Pg. 1 of the GAIL invoice summary – two sources were being used GAIL and RAVVA. An avg. price Rs. 3071.08/ 1000 SCM is available. For 3 year construction period, an annual 5% escalation is applied to get price Rs. 4290.74 in first operations year. This calculation is already provided in financial models. The gas price is now taken from 1st invoice i.e. Apr 2009 (month of COD) and financial model is updated as per.	vi) The price of natural gas as per GAIL invoice is Rs.3561.89/1000SCM (inclusive of LST at 16%). Even with an escalation of 5% during the three year construction period the cost is Rs.4123.33. The issue is open. The gas price is Rs.4279.83 per 1000 SCM. The issue is open.
vii. The PP has assumed an escalation of 5% in the		vii) The assumed value is conservative comparing with the NG pricing trend	The data provided has been verified; also provide reference

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
prices of natural gases for three year construction period. Clarify the basis for considering this 5%. Also clarify the methodology used for changes made to the prices of natural gases		available on http://www.oilnergy.com/1gnymex.htm#since30 @Cost of gas- 3.02-(USD/MMBTU). A 10 year historic price index for natural gas on New York Mercantile Exchange (from Feb. 1994) shows 7% annual escalation (copy of data provided to DOE) Any gas price escalation is not use now.	or URL link for the historic price index for natural gas considered in the spreadsheet, hence issue is open. The revised financials have been verified and the issue is closed.
viii. Substantiate with evidence for considering construction period from December 2003 to September 2005.		viii) As per EPC contract signed in June 2003 [Vol 1, Pg. 23 (37 of pdf file)], there was a completion schedule of 670 days from commencement.	viii) The EPC contract agreement has been verified and the issue is closed.
ix. The commercial date of operation is 14th April 2009. Justify for considering all the input parameters as at December 2003		ix) The financial closure, payments to EPC contractor and interest calculation started in 2003. The actual expense out go as started in 2003 and hence all rates as applicable on the day are considered. This is the actual financial closure model (as confirmed with total project cost in common loan agreement). The Annual report of the GVKPIL (2008-	ix) Substantiate for the time gap from project initiation to commercial date of operation. The issue is open. The Annual report has been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		09, pg. 29 http://www.gvk.com/i/GVKPIL-15th-AR-2008-09.pdf) has given justification for the delay in plant COD as 'delay in start of gas supply'.	
x. The land purchase cost is presented in a spreadsheet. We require a copy of sale deed to verify the numbers stated in the spreadsheet		x) The land cost is towards land sale deeds (will be submitted – hard copies being couriered) and some site development charges. The land sale deeds for Rs. 8.8 million used in the project cost are submitted to the DOE now. The site development charge has been deleted from the total project cost and land cost is revised to 4.45 Mn.	x) The land documents are yet to be verified, the issue is open. The land sale deeds for Rs.4.45 million have been verified. However provide evidence for development charges incurred Rs.4.33 million. The issue is open. The revised calculations have been verified and the issue is closed.
xi. The PPA states the capacity as 220MW while the PP has considered 228MW. Clarify		xi) PPA capacity is how much plant can sale. To account for 3% auxiliaries and station heat degradation in later life, EPC was awarded for 228 MW and hence all calculations are as per this value. Note, PPA does not restrict size on higher side, but has penalty for lower configurations. Please refer pg. 10, clause 35 of the PPA (if higher size is observed in the tests, the	xi) PPA capacity is how much plant can sale. Explain. The issue is open Note, PPA does not restrict size on higher side, but has penalty for lower configurations. Reference for this clause in the PPA to be mentioned. The reference has been verified

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		initial guaranteed capacity will be considered Installed Capacity.)	and the issue is closed.
xii. Substantiate with evidence the basis for estimating site development cost at Rs.7 million		xii) The PP has submitted common loan agreement and cost is justified therein and very small contracts for civil work etc. will be difficult to trace. The site development cost is removed from the financial analysis. It has been removed from the revised assumptions sheet now.	xii) PP is advised to provide estimation documents, the issue is open. The revised financials has been verified and observed that the same is stated in the assumption spreadsheet. The issue is open. The revised financials have been verified and found. The issue is closed.
xiii. Provide URL reference link of CERC guidelines for tariff calculations 2001 for O & M cost.		xiii) The 2001 Guidance is not available online and a soft copy is provided to DOE (attached).	xiii) The CERC tariff notification was verified and the issue is closed.
xiv. The O & M cost is assumed at 2.5%. Clarification is sought as to 2.5% on what parameter		xiv) The O&M cost is 2.5% of the capital cost as per CERC Guidance 2001 (pg. 11). This is stated in the PD and financial model.	xiv) The CERC tariff notification was verified with respect to O & M charges considered by PP at 2.5% and the issue is closed.
xv. The insurance cost considered for the first year is Rs.30 million and for the second year Rs.61		xv) In the assumptions sheet, 1% insurance of capital cost is considered (refer pg. 56 of	xv) The insurance expenses are considered at 1% of capital cost

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
million. Provide relevant supporting documents as the PP has submitted Industrial All Risk Insurance taken with United India Insurance Co Ltd and the insurance is borne by seven insuring companies.		Appraisal report pg. 51 of pdf file – this is 1% of cap cost for operating phase I). The phase II model value has used conservative value. The insurance expense is now used from the actual insurance agreement for 15/12/2010 to 14/12/2011. For the first year of operation, the cost of insurance premium is higher than that applied now (evidence attached). Hence, the conservative figure is retained.	in the input spreadsheet and the same is considered in the cost of generation spreadsheet also. Clarify where in the calculations insurance cost of Phase II is considered. The actual insurance agreement is dated 15.12.10 to 14.12.11. However the plant operations have commenced from April 2009. The issue is open. The explanation is accepted and the issue is closed.
Provide a copy of EPC contract.		EPC contract with Alstom dt. June 2003is already submitted in the CD sent to DOE.	The EPC contract with Alstom has been verified and the issue is closed.
xvi. The major maintenance cost is assumed at 3.75%. Clarification is sought as to 3.75% on what parameter.		xvi) The Project Appraisal Report pg. 113 (108 of pdf), gives O&M cost at 3.88% of cap cost. The O&M used is now 3.88% of the capital cost as per appraisal report.	xvi) The issue is open as there is not relevant explanation as to basis for considering 3.75%. The issue is open. The revised financials have been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xvii. Justify the basis for apportioning the O & M cost into fixed and variable costs.		xvii) As part of standard practice, the costs are broken up in subcomponents. This is part of the Bank's Appraisal model and as this is within 3.75%, may be considered conservative. The practice referred is applicable for both the industry and banks. The financial appraisal model and financial closure models of the project also have such break up. As the total O&M cost used was 3.75% < hat specified overall (3.88%), this was requested to be considered conservative.	xvii) Please clarify with evidence what is standard practice, is it of the industry or banks. Also clarify the statement "may be considered conservative". The issue is open. The explanation is accepted and the issue is closed.
xviii. Substantiate the basis for considering contingency cost in variable and major maintenance O & M costs		xviii) As part of standard practice, the costs are broken up in subcomponents. This is taken from Phase I plant experience and as this is within 3.75%, may be considered conservative. The practice referred is applicable for both the industry and banks. The financial appraisal model and financial closure models of the project also have such break up. As the total O&M cost used was 3.75% < hat specified overall (3.88%), this was requested to be considered conservative.	xviii) Please clarify with evidence what is standard practice, is it of the industry or banks. Also clarify the statement "may be considered conservative". The issue is open. The explanation is accepted and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xix. Substantiate with evidence the basis for tariff assumed (foreign debt service charge and other fixed charge).		xix) Refer the PPA clause No. 3.2(i) on pg. 17 – A components in the Tariff - Capacity Charge and its sub component FDSC = USD 0.006/ kWh.	xix) The PPA has been verified and the issue is closed.
xx. Substantiate the basis for apportioning the O & M cost into USD and rupee component as 65:35 with an escalation of 2% and 5% respectively		xx) The Project Appraisal Report pg. 113 (108 of pdf), gives basis for these inputs.	xx) The Project Appraisal Report has been verified and the issue is closed.
xxi. Provide reference or URL link for the rates of depreciation considered as per Electricity Supply Act		xxi) Electricity Supply Act taxes are given in a book extract (Direct Taxes Ready Reckoner 2010, showing rates applicable in 2003). The Ministry of Power Notification referred for the plant life and depreciation rates refers to 'the Electricity (Supply) Act, 1948'. Here, depreciation rate for steam power plants is 7.24% and for gas power plants it is 8.24%. The appraisal report was developed by IDBI bank.	xxi) Substantiate with evidence whether the rates prescribed in the Direct Taxes Ready Recokner is the same in the Electricity Supply Act also. The issue is open. However as per Project Appraisal Report the rate of deprecation is 7.84%. Clarify The reference provided has been verified and the issue is closed.
xxii. Substantiate the basis for estimating auxiliary consumption at 3% during		xxii) The auxiliary consumption is taken from CERC (Terms & Conditions of Tariff) Regulations, 2001, pg. 8.	xxii) The CERC notification has been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
stabilization and post stabilization period. xxiii. Substantiate the significance for considering withholding tax in Mauritius and Switzerland.		xxiii) Both these terms were not used in calculations and are removed. As part of EPC payments, some payments were to be paid in these countries and hence a provision was made.	xxiii) The revised calculations have been verified and the issue is closed.
xxiv. Provide reference or URL link for exchange rates considered for CHF and USD.		xxiv) The exchange rates are used from Bank's Appraisal report (as on date) pg. 40 (35 of pdf file) The reference is corrected to the Appraisal report.	xxiv) Provide the specific clause as the same is not available in page 35 of the PDF Bank's Common Loan Agreement. The issue is open. The reference provided in the Bank's Appraisal report has been verified and the issue is closed.
xxv. Substantiate for considering annual depreciation rate of rupee during the operation period as 3%.		xxv) The rupee depreciation rate is removed from the financial model.	xxv) Provide the specific clause in the PDF Bank's Common Loan Agreement. The issue is open. The revised financials have been verified and the issue is closed.
xxvi. Substantiate with evidence for considering interest rate on working capital at 13% per annum.		xxvi) ICICI Bank Appraisal report pg. 111 (107 of pdf) The interest on WC is modified to 13.5%.	xxvi) ICICI Bank Appraisal Report page number 107 of PDF states the interest on bank borrowing for working capital is

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			13.5% per annum. The issue is open. The revised financials have been verified and the issue is closed.
xxvii. Substantiate for considering 1% of the capital cost as inventory of spares in calculation of working capital requirement.		xxvii) CERC Tariff Regulations 2001, pg.13, clause iv	xxvii) The CERC notification has been verified and the issue is closed.
xxviii. Substantiate the basis for considering receivables credit period as 35 days.		xxviii) CERC Tariff Regulations 2001, pg.13, clause v allows two months receivables. Here, one month receivables + 5 days (as per rebate clause in PPA) for APTransco to pay is considered	xxviii) The rebate clause in PPA has been verified and it is accepted to consider receivables credit period as 35 days and the issue is closed.
xxix. The total cost is split into cost and overheads in the depreciation spreadsheet. Clarification is sought as to why there is a split of cost.		xxix) As different rates for P&M, civil etc. depreciation are to be applied, thus total cost is broken in major categories. The overheads category is not referred now.	xxix) The explanation is irrelevant to the CL and the issue is open. The revised financials have been verified and the issue is closed.
xxx. The term loan availed from ICICI Bank Ltd is Rs.5,000 million as per their letter dated 15th January 2004. However the PP has considered Rs.4,855.17 million in the financial statements.		xxx) The small change is project cost was due to foreign loan component (exchange rate fluctuation). However, lower cost is considered in the analysis, may be considered conservative.	xxx) Lower cost is Rs.4853.66 million; the PP has still considered Rs.4855.17 million in the revised calculations. The issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
The common loan agreement dated 20th November 2003 states rupee term loan as Rs.4,853.66. Clarify		The PP has removed site development cost and hence total cap cost as well as the loan component (<Rs.4853.66 million) has come down now.	The revised financials have been verified and the issue is closed.
xxxi. The PP has submitted an amendment to common loan agreement. As per Schedule I the rupee term loan availed is Rs.500 crores from nine different banks. Clarify where this loan availed is considered in the analysis.		xxxi) The amendment was signed however this loan was not used. Thus, it is not accounted. There are some main agreement clause changes, thus this amendment was submitted.	xxxi) The explanation is accepted and the issue is closed.
xxxii. The PP has also considered loan availed from Canara Bank and Bank of Baroda. The common loan agreement states the names of these two banks in the facility agent agreement dated November 20th 2003, provide documents in support of the loan amount availed as per the loan spreadsheet.		xxxii) Common Loan Agreement pg. 121 (124 of pdf) gives two foreign currency loans from these two banks. Thus, a different interest calculation and loan repayment calculation is presented. As per loan approval, BoB had first 14 half yearly repayments in USD term, then remaining loan is converted to rupee terms (cell F244). The repayment in rupee term is taken from Oct 2013 (cell P-290).	xxxii) The Common Loan agreement has been verified and found that the foreign currency loan availed from Canara Bank being 15 million US$ is considered in the loan spreadsheet. However loan availed from Bank of Baroda as per the Common Loan agreement is 35 million US$ and only 18.01 million US$ is considered in the loan spreadsheet. Clarify. The issue is open. The revised calculations have been verified and the issue is

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			closed.
xxxiii. The moratorium period for IFI US $ loan is 6 months and the repayment is on half-yearly basis for 7 years. However there is a balance of 18.01 million $ for which another loan is availed from Bank of Baroda to repay the same. Clarify the assumption for the decision made.		xxxiii) BoB repayment terms required to pay in $ terms initially (first 14 instalments) Refer Loan agreement pg. 139-140).	xxxiii) The Common Loan Agreement has been verified and the issue is closed.
xxxiv. The rupee loan taken from Bank of Baroda is prepared only for 3 years. Justify for having a principal balance of Rs.254.06 million remaining to be repaid as per the loan spreadsheet.		xxxiv) The company has availed US $ 35 Million from BOB. As per the Common Loan Agreement Schedules Part-C Page No. 140, the repayment installments of BOB after the 14th Repayment installment shall be converted into Rupees at the inter bank exchange rate prevailing at the end of 9 years from the date of first disbursement by BOB in accordance with the provisions of Schedule XIII to the Common Loan Agreement dated 20th November, 2003. Accordingly, in the financial model-Loan Sheet we have prepared the Foreign currency Loan schedule for the first 14 half yearly installments and after that the Balance US $ 12.60 million will be	xxxiv) The PP has considered 18 million US$ out of 35 million US$ and repayment is in 14 quarterly instalment. Clarify what is the status of the balance of 17 million US$. Provide F model for ready reference, hence issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		converted into Rupee Term Loan and will be repaid in 13 Quarterly instalments as per the Interest on Rupee Term Loan-Bank of Baroda debt schedule. After the repayment, the closing balance is Nil. The justification is given above in response to point (xxxii). The financial model for gas based alternative was referred as F model.	The revised calculations have been verified and the issue is closed.
xxxv. Substantiate for not considering the principal loan amount of 15 million dollars availed from Canara Bank in the loan spreadsheet. However interest is also calculated which results in inflow of funds instead of outflow. Clarify		xxxv) The company has availed US $ 15 Million from Canara bank. As per the Common Loan Agreement Schedules Part-B Page No. 139, The Loan from Canara bank will be converted into Rupee Term Loan at the end of two years from the date of first disbursement at the inter bank exchange rate prevailing on the date of conversion in accordance with the provisions of Schedule XIII to the Common Loan Agreement dated 20th November, 2003. Accordingly, in the financial model – loan sheet Cell No. H 48 we have shown US $ 15 Million as repayment and have prepared	xxxv) The revised calculations have been verified; however in loan spreadsheet cell no. H48 states principal repayments but no payments are shown. Clarify in which row the same is shown, the issue is open. The revised financials have been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		a separated debt Repayment schedule " Interest on IFI-US$ Loan- Canara bank". USD 15 million is converted to INR in cell F167 and repayment is show in the loan sheet. The linking error that resulted in negative numbers in some cells is rectified.	
xxxvi. The total project cost as per the assumption spreadsheet is Rs.7,205.90 million while it is Rs.7,203.66 million as per PD. Clarify		xxxvi) The cap cost sheet is updated to have same project cost consistent with PD and the Common Loan Agreement Pg. 134 (pg. 137 of pdf file)	xxxvi) The revised calculations have been verified and the issue is closed.
There is one IFI loan in US $ while the other three loans availed are calculated in INR. It is suggested to convert the same into INR by applying the appropriate exchange rates.		The interest rates of foreign currency loans are different (linked to LIBOR rates) and hence a separate interest calculation is required. Thus, it can not be missed with the rupee calculation.	The explanation is accepted and the issue is closed.
xxxvii. Substantiate for considering units generated under two different heads: variable charges with 85% PLF and capacity charges with 80% PLF.		xxxvii) As per PPA, pg. 20, clause 3.7, there is an incentive structure from PLF above 80%. This for incentives calculation, separate capacity charge calculation is applied.	xxxvii) The explanation is accepted and the issue is closed.
xxxviii. Substantiate for considering 3% of		xxxviii) The 3% is accounted for auxiliary consumption as per CERC (Terms &	xxxviii) The CERC notification has been verified and the issue is

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
units generated as losses under variable and capacity charges.		Conditions of Tariff) Regulations, 2001, pg. 8. There are no separate losses. Total generation at given PLF – auxiliaries is net saleable to grid and hence revenue calculation linked to net sale to grid.	closed.
xxxix. Substantiate the parameters considered in the calculation of transmission charges in the revenue spreadsheet.		xxxix) Transmission charges (for fuel) are calculated from Project Appraisal report pg. 113 (pg. 108 in pdf file). This monthly charges (27.3 Mn) are multiplied by 12 to get annual charge 327.6 Mn and annual 3% escalation is applied as per Appraisal report pg. 113.	xxxix) The Project Appraisal Report states transportation charges. Clarify and change accordingly. The charges considered are accepted and the issue is closed.
xl. Substantiate the parameters considered in the calculation of other fixed charges as there is a minimum parameter in the formula in the revenue spreadsheet (row no.29).		xl) Other fixed charges is a fixed number as per PPA (Rs. 0.669/ kWh) as per PPA, pg. 17, clause No. 3.2.	xl) The PPA has been verified and the issue is closed.
xli. Clarify the significance of calculating incentives in the revenue spreadsheet.		xli) As per PPA, pg. 20, clause 3.7, there is a incentive structure from PLF above 80%.	xli) The explanation is accepted and the issue is closed.
xlii. Clarify the significance of rebate calculated at 2.5% in the revenue spreadsheet.		xlii) As per PPA, pg. 30, clause 5.11, if payment from APTRansco is made within 5 days, a 2.5% rebate is allowed.	xlii) The explanation is accepted and the PPA has been verified and the issue is closed.
		xliii) The FDSC is as per PPA clause in	xliii) The explanation is accepted

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
xliii. It is suggested to convert the foreign debt service charges into INR by applying the appropriate exchange rates.		USD terms. Depending on exchange rate variation, it is already calculated in Rupee terms for revenue calculation.	and the PPA has been verified and the issue is closed.
xliv. Substantiate with evidence for considering PV factor as 12% in the analysis.		xliv) The RBI weekly statistical data published on 10/04/2009 (latest available at VCS project start date http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/4Tab_100409.pdf) shows latest PLR as 11.50- 12.50% and average of these two 12% is used for discounting.	xliv) There is no explanation provided. The issue is open. The explanation is accepted and the issue is closed.
xlv. Provide cost of generation spreadsheet for verification.		xlv) The sheet was hidden and is made available now (next to COG Final).	xlv) The revised calculations have been verified and the issue is closed.
xlvi. Justify for considering depreciation as per ES Act instead of as per the Companies Act.		xlvi) The income tax calculation has to be done as per the special depreciation rates (accelerated in this case) as per ES Act. The depreciation rate is modified as per the Companies Act. The links to P&L (which in turn was through Dep sheets is updated to the Companies Act. The ES Act rates have been deleted from the Input sheet for	xlvi) Clarify and give a relevant explanation, also clarify the same is considered as the rates of depreciation is the same as per ES Act and Income tax Act, the issue is open. The revised financials (P & L spreadsheet) have been verified and observed that depreciation is considered as per ES Act. The issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		clarity.	The revised calculations have been verified and the issue is closed.
xlvii. The revenue realized from salvage value is considered as Rs.733 million while the WDV as per the depreciation spreadsheet is Rs.720 million. Substantiate.		xlvii) The salvage value was wrongly linked to civil and total. The correction is made now.	xlvii) The revised calculations have been verified and the issue is closed.
xlviii. Substantiate for apportioning the total tariff into variable and fixed charges in the P & L spreadsheet.		xlviii) The PPA specifies rates for fixed and variable charges as per components included in each (refer pg. 17 and 18). The tariff calculation is as per PPA to get revenue.	xlviii) The explanation is accepted and the issue is closed.
xlix. Substantiate for not considering escalation in the prices of fuel in both NG and coal based.		xlvi) As a conservative measure, the fuel price is not escalated (rather than escalating these fuels at different rates).	xlix) The explanation is accepted and the issue is closed.
l. Row no. 11 in the tax spreadsheet represents salvage value and not interest income. Clarify		l) The correction is made to represent this income from salvage value.	l) The revised calculations have been verified and the issue is closed.
li. Clarify the significance of calculating gross tax as in row no.22 in the tax spreadsheet and the same is considered as a tax reimbursement in		li) The total tax liable by PP for this project will be reimbursed by APTransco as per PPA (pg. 20-21, clause 3.8 to 3.10).	li) The PPA has been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
row no.26 of the P & L spreadsheet. It is also observed that the tax reimbursement and the tax payouts are the same. lii. The sensitivity analysis to be presented in spreadsheet.		lii) The sensitivity analysis can be seen in the excel sheets by choosing drop down menu in following cells 1) PLF : Input sheet, Cell S 25 2) heat rate : Input sheet, Cell F 128 3) Fuel price: Input sheet, Cell F 132	lii) The Input spreadsheet has been verified and the issue is closed.
b.)Coal Based Power plant: i. Substantiate for considering the plant capacity as 250MW for coal based while 228MW is considered for NG based plant. ii. Substantiate with evidence for considering auxiliary consumption as 9.5% of power generated. iii. Provide evidence for plant life estimated at 25	2.4,2.5	i) Pg. 24 of the PD already gives the comparative output of the two alternatives. Due to standard block sizes available for coal based power plants and difference in the auxiliary consumption, the total output is comparable (only ~ 2.8% difference). ii) Refer CERC (Terms & Conditions of tariff) Regulations, 2001, pg. 8 iii) The notification given by Ministry of	i) The explanation is accepted and the issue is closed. ii) The CERC notification has been verified and the issue is closed. iii) The notification has been

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
years.		Power dated 29th March 1994 also gives this value – note pg. 2 – steam electric (generating stations)	verified and the issue is closed.
iv. Substantiate for the calculation made for 20 years for coal based generation and 15 years for NG based generation. Justify for the comparisons made.		iv) The financial calculation is done for the complete technical life of the gas plant. For coal plant also, the analysis is restricted to 15 years not for comparison.	iv) The revised calculations have been verified and the issue is closed.
v. Substantiate for considering tariff as return on equity at 16%.		v) The return on equity is not used in calculations of tariff or levelised cost. The return on equity is used from CERC (Terms & Conditions of tariff) Regulations 2001, pg. 10.	v) Clarify for considering return on equity in row no.28 of the revenue spreadsheet which is the tariff component. The issue is open. The explanation is accepted and the issue is closed.
vi. Substantiate with evidence for considering construction period from December 2003 to November 2006.		vi) As per knowledge of PP, a three years construction period is considered. The PP had taken up development of a coal based power plant a three year construction period was envisaged for its development (Att. 4)	vi) A clear explanation is sought as to the basis for forming this opinion. The issue is open. The reference provided has been verified and the issue is closed.
vii. Substantiate with evidence for considering O & M cost at 2.5% of capital cost with an annual escalation of 6%.		vii) CERC (Terms & Conditions of tariff) Regulations, 2001, pg. 11, clause (ii) and (iii) give evidence for both these inputs.	vii) The CERC notification has been verified and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
viii. Substantiate with evidence for considering interest rate on working capital at 13% per annum.		viii) This is kept same as the NG baseline alternative. This is changed to 13.5% as per the ICICI Bank Appraisal report pg. 111 (107 of pdf). The interest rate in the Input sheet, Cells O144 and P144 are revised to 13.5% now.	viii) This issue is open in the NG baseline; hence here also this issue is open. The revised calculations have been verified and observed that the interest on working capital is 13%, the issue is open.
ix. The total cost is split into cost and overheads in the depreciation spreadsheet. Clarification is sought as to why there is a split of cost.		ix) The total project cost of a large scale power plant has this component as can also be seen in the gas model (cap cost sheet). The overheads terms is not used now and financial model is updated as per.	The revised calculations have been verified and the issue is closed. ix) This issue is open in the NG baseline; hence here also this issue is open. The revised calculations have been verified and the issue is closed.
x. Provide reference or URL link for the rates of depreciation considered as per Electricity Supply Act.		x) Electricity Supply Act taxes are given in a book extract (Direct Taxes Ready Reckoner 2010, showing rates applicable in 2003). The link in P&L and COG sheets is already with the Companies Act depreciation rates.	x) This issue is open in the NG baseline; hence here also this issue is open. The revised calculations have been verified and the issue is closed.
xi. Substantiate with evidence for considering PV		xi) This is kept same as gas model for	xi) This is open in the NG

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
factor as 12% in the analysis.		conservative comparison. The average of latest available PLR values from RBI is used (Ref given in response above).	baseline as no explanation is provided; hence here also this issue is open. The explanation is accepted and the issue is closed.
xii. Clarify the significance of Adv Dep spreadsheet.		xii) The worksheet is used to calculate advance against depreciation (CERC Tariff order 2001 – pg. 27)	xii) The CERC notification has been verified and the issue is closed.
xiii. Substantiate for considering units generated under two different heads: variable charges with 85% PLF, capacity charges with 80% PLF and incentive calculation with 90% PLF.		xiii) As there is incentive for operating at different PLF, it is kept same as PPA for gas model for easy comparison.	xiii) The explanation is accepted and the issue is closed.
xiv. Clarify for tax reimbursement and the tax payouts to be the same.		xiv) As tax in case of gas model is reimbursed by APTransco, for easy comparison, it is kept same as per gas plant PPA. The tax reimbursement from P&L sheet is removed and levelised cost is unaffected. The Tax reimbursement is now deleted from the coal financial model – revenue sheet.	xiv) Justify how the same can be applied to coal based power generation. The issue is open. Tax reimbursement is considered in the revenue spreadsheet, the issue is open. The revised calculations have been verified and the issue is closed.
xv. Clarify whether salvage value is considered in the analysis.		xv) Salvage value is not considered (as 10% in case of gas plant at end of life), but	xv) The explanation is accepted and the issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		for coal, plant life is 25 year and at the end of 15 year analysis, huge revenue will be considered.	
CL-5 Monitoring: For baseline emissions: i) PP needs to clarify the monitoring of auxiliary consumption of the proposed project activity during the crediting period.	3.2,3.3,3.4	i) The requirement in methodology is to monitor 'net electricity supplied to grid'. As this is already metered separately by a dedicated meter (maintained as per PPA requirements for quarterly checks and calibration in six month) and not affected by auxiliary consumption and import from the grid (as net export = total export – import; total export = total generation – auxiliary). Thus, auxiliary consumption is not metered separately. Only auxiliary consumption will not be verifiable for QA/QC and PP is not maintaining (as per CDM guidance like annual calibration) metering of the auxiliary meter as this is only for the internal records. The correlation of auxiliary consumption with the required metering of net electricity export to the grid will also require monitoring of	i) Methodology does not mention to monitor only the net electricity supplied to the grid. Auxiliary consumption needs to be monitored to evaluate the consumption. Separate metering will help to review the estimation of Auxiliary consumption. The issue is open. PJRCDM 3rd response The justification provided by the PP is acceptable. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		electricity generation, import from grid along with the auxiliary. As PP is metering the required parameter EGPJ,y, this will meet baseline methodology requirement.	
ii) In the baseline emission estimation calculations, PP has selected build margin as the emission factor of the fuel mix in the grid. PP is required to clarify the option selected for the build margin. Is it fixed ex-ante or will be updated ex-post during the first crediting period?		ii) Following modification is made to specify which option is lowest emission factor and will be monitored ex-post. As per the requirement of baseline methodology (pg. 6, line No. 2 and 3) as the Option 1 has lowest emission factor, this will be monitored ex-post.	ii) For baseline emission estimation, build margin emission factor will be monitored ex-post. The issue is closed.
iii) PP needs to clarify the approach to be followed in case of emergencies like both energy meters i.e. main and check meters are out of order. How will the electricity supply to the grid in that case be monitored?		iii) An emergency plan is included in the Section 3.4 of the revised PD to compute net electricity supplied to grid in case 'Both electricity meters (main and check) failure' The faulty meter will be replaced immediately (with plant shut down during time when meter is being replaced).	iii)In case both the energy meters fail, emergency plan states that new meters will be installed for further monitoring. But this will consume some time. PP to clarify the method used to monitor the electricity exported to the grid in that failure period. The issue is open. PJRCDM 3rd response Justification provided in the revised PD clarifies the

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			emergency plan regarding the faulty meter. The issue is closed
iv) Section 3.4 in the PD states that the monthly invoices from TNEB will be crosschecked. PP needs to clarify how TNEB (Tamil Nadu Electricity Board) is involved in this project. For project emissions:		iv) This was an inadvertent error and is word replaced by APTrasco.	iv) TNEB word is deleted & correction is made in section 3.4 of PD. The issue is closed.
v) Monitoring of LNG has been considered in the monitoring plan, please clarify if the same will be used in the project activity. If yes, the same needs to be considered in the emission reduction calculations as well.		v) LNG use is not envisaged. However, as required in the meth, only a provision is made to monitor and also calculate project emissions, leakage in case of LNG use. So far, PP doesn't envisage LNG to be used in project activity plant as there is not LNG terminal in vicinity so far.	v) At present, the project is based only on Natural gas as fuel. However, if in future, PP uses the LNG for power generation, the emissions due to the same would be considered in the final emission reduction calculations. PP has included the monitoring of LNG in the monitoring plan. The issue is closed.
vi) Similarly, PP has also included the monitoring of any other fossil fuel consumed in the project		vi) The baseline methodology AM0029 allows start up/ auxiliary fuels to be used at	vi) At present the project activity uses natural gas as the primary

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
activity. However, in the methodology applicability discussion, PP has claimed that as per the revised PPA, GVK would not be allowed to use any other fuel except Natural gas. Keeping that in mind, Pl justify the inclusion of this parameter in the monitoring plan.		1% of total energy. Thus, a provision is made. Also, to demonstrate that NG was the only fuel used in a monitoring period, this provision will be useful to check if any other fossil fuel is used. The amended PPA is shared with DOE clearly saying NG as only fuel.	fuel. If any other fossil fuel will be used in the project activity, the emissions from the same will be considered in the final emission reduction calculations. The issue is closed.
vii) PP needs to clarify what would be the primary source of data for gas consumed by the project under consideration. PP also needs to clarify the cross check point for the gas consumed by the project in line with the monitoring methodology AM0029. The same needs to be clearly stated in the PD as well.		vii) The monitoring methodology AM0029 (pg. 12) requires 'The total fuel consumption will be monitored both at supplier and project end for cross-verification'. The primary source of NG consumption will be meter reading at GAIL terminal. The cross check will be done with the gas bills from GAIL and tallied with check meter of PP. The main metering used for gas billing is gas meter at GAIL terminal. Thus, this is chosen as primary meter. The cross check mechanism is invoice from GAIL for gas bill and readings are also tallied with check meter installed by the PP.	vii) Methodology says that the total fuel consumption will be monitored both at supplier & project end. But the monitoring provision at the supplier end is not mentioned in the PD. PP needs to demonstrate the cross check of primary source consumption of NG. The issue is open PJRCDM 3rd response Revised PD demonstrates the crosscheck of primary source consumption of NG. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
viii) The calibration frequency and procedure for the calibration of the gas flow meters both at the project site and the supplier gas terminal needs to be clearly defined in the VCS PD.		viii) Annual calibration is specified now as the calibration frequency. The electricity meter calibration certificate gives the validity of calibration. The procedures for calibration are included in the PD now. As per the gas supply agreement with GAIL, clause 8.02, pg. no. 22 (of pdf file), there is no calibration frequency mentioned (refer – to be mutually agreed). However, for VCS purpose, PP proposes to calibrate gas flow meter annually. The calibration frequency of gas flow meter was included in the Pd and is highlighted in PD (refer page 34).	viii) Annual calibration frequency should reflect in the calibration certificate. Procedure for calibration of both the gas flow meters is not mentioned in the PD. PP needs to provide calibration certificates of gas flow meters. The issue is open PJRCDM 3rd response PJRCDM requests PP to respond to the issue raised in point no. (viii) wherein we have asked about the calibration frequency and calibration procedure details for gas flow meters (external i.e. GAIL as well as the internal at PPs end). The issue is open PJRCDM 4th response PP needs to include the calibration frequency in the PD The issue is open PJRCDM 5th response: The justification is provided in the revised PD.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
ix) Net calorific value: As verified during the site visit, the supplier provides gross calorific (GCV) of the gas supplied. Please clarify in the VCS PD, how the same would be used in the project emission calculations. As per the methodology requirement, PP is required to use the NCV of the natural gas.		ix) The new format of GAIL invoice includes NCV as well. However, a provision is made for GCV to NCV conversion using delta 10% as per CEA CO2 baseline database for Indian Power Sector, Database Excel Sheet, Assumptions worksheet, Cell F8. The check meter of PP will meter NCV directly. The invoices are made by GAIL and out of PP's control. In any case, the invoice also gives the NCV. The primary source of gas (quantity) and NCV will be GAIL meters as same is used for billing – a QA/QC measure to tally third party given gas bills. The secondary source of gas quantity and NCV will be meters installed by the PP. This is also in line with the fuel supply agreement. This is mentioned in the Section 3.3 of the PD.	The issue is closed. ix) PP needs to measure the NG consumption in NCV basis directly. The issue is open. PJRCDM 3rd response PP has stated that the GCV as provided in the GAIL invoice would be converted to NCV using delta 10% as per CEA CO2 baseline database for Indian Power Sector. In addition to that, it is also stated that even the GAIL invoice provides information regarding the NCV of the gas supplied. Apart from the above, PP would also monitor the NCV of gas at the internal check point at PP's end. From the above discussion, PP is stating 3 sources for the NCV of the supplied gas. To arrive at the conservative emission reductions, PJRCDM requests PP to compare all these values

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		The monitoring table is updated to choose suppliers meter as main meter and PP's meter as check meter (in line with fuel supply agreement). In case of difference in the two meters, the emergency plan as described in the section 3.4 of PD will be followed to get the most conservative value – lowest NCV value. Weighted average NCV for the first 15 days of gas supply from COD is computed and use for the CER as well as financial calculation is used.	and use the most conservative figure for NCV for emission reduction calculations. The same discussion needs to be included in the VCS PD as well. The issue is still open. PJRCDM 4th response PP needs to demonstrate the 3 values from sources of GAIL invoice,NCV from check meter & Co2 baseline database value in the PD & use the most conservative option in the calculations. The issue is open PJRCDM 5th response: The response provided in the revised PD is acceptable. The issue is closed.
x) PP is also required to clearly state the primary source of data for the NCV of the natural gas consumed in the project activity. In addition to above, as per the applied methodology, AM0029 version 03, fuel emission factor of fuels used in project activity (i.e. NG in		x) Primary source is specified as GAIL gas supplier) terminal, gas chromatogram readings. Cross check will be done with the invoices and tallying with the PP's check meter. A sample GC report, gas invoices in the	x) PP needs to substantiate the primary source of data for NG consumption & provide gas chromatograph readings, invoice copies & check meter readings. The issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
proposed project case), Oxidation factor of the fuel needs to be monitored. Please include the same in the monitoring plan		month of COD (Apr 2009) and latest are attached (Att. 9). The GAIL meters will be used as primary and meters installed by PP will be check meters. This is made consistent in the PD. As mentioned in the response above the most conservative value that is highest NCV is used for emission reduction calculation. This is mentioned in the PD The parameters like emission factor and	PJRCDM 3rd response The source of NCV of gas that will considered for emission reduction needs to be defined in line with the response to point no. (ix) above and clearly stated in the VCS PD. The issue is open PJRCDM 4th response Although it is mentioned that GAIL meters will be used as primary meters but the invoices ptovided only gives a single value.It is not correct to use this single value for calculations.Averaging out should be done as done for gas price. The issue is open PJRCDM 5th response: The response provided in the revised PD is acceptable. The issue is closed. The monitoring of emission

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		oxidation factor of NG is included in the monitoring plant under Section 3.3 of the modified PD. The BM value in ER sheet and PD is updated.	factor of Fuel consumed in the project activity as well as the Oxidation factor has been included in the monitoring plant in the VCS PD. Though the same is sourced from the IPCC guidelines, however, in case there is any revision in the above values during the crediting period, the same would be applied for emission reduction calculations. The issue is closed.
CL 6: GHG emission reductions: Project emissions: i) PP is yet to clarify and demonstrate that the only fuel used at the project site is natural gas and no other fuel is consumed. ii) Please clarify the source of emission factor of natural gas used in the project emission calculations. The same needs to be clearly stated in section 4.1 of the	4.2	i) A monitoring plan is presented to show that if LNG or any fossil fuel (as start up/ auxiliary) is used, it will be monitored. Also, the amended PPA has clearly stated that NG as the only fuel. ii) The baseline methodology AM0029 requirement for emission factor is 'as determined from the fuel supplier, wherever possible, otherwise from local or	i) The amended PPA states that only natural gas will be used as a fuel. The issue is closed. ii)The source of emission factor as defined in the methodology is mentioned in the PD section 4.1 The issue is closed.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
VCS PD. PP is also required to justify the choice keeping in mind the methodology requirement.		national data'. As supplier of gas does not specify emission factor, also NATCOM report is checked and it has also referred IPCC for this value. Thus, IPCC default is used as per the preference order in the methodology. The table for EFNG monitoring specifies the choice of this source and also in Section 4.1 of the PD.	
iii) The source of NCV of the gas consumed in the project activity needs to be clearly stated in section 4.1 of the VCS PD. The choice needs to be justified by the PP keeping in mind methodology requirement.		iii) The choice of NCV source from supplier invoice is stated in Section 4.1 of the revised PD. Gas invoices for RIL gas are also raised by GAIL. Please note the 'RIL-D6' mention in the invoices of Dec. 2010 (Att. 9). The gas flow and NCV will be used from GAIL meters (main meter, in line with FSA). The meters installed by PP will be used as check meters.	iii) The choice of NCV source of the fuel used is in line with the methodology. But the evidence proof (invoice copy from the current supplier i.e. Reliance) is not provided. PP to provide latest NG supplier invoice from Reliance The issue is open. PJRCDM 3rd response The source of NCV needs to be explained in line with response to point no (ix) of CL 5 above. The issue is open. The source of NCV source is correctly justified.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			The issue is closed
iv) During calculation of project emissions, Volume of fuel(natural gas) combusted in project plant (FC f,y) is stated as 333, 162, 491 SCM. However, as per PJRCDM's calculations, the fuel consumption is found to be 333,198,508.3 SCM. Pl recheck & correct accordingly Baseline emissions:		iv) The VER sheet submitted (worksheet BE & PE) has given calculation of NG requirement for total electricity generation (228 MW at 85% PLF) based on heat rate (NCV basis). The calculation is corrected (wrt modification in BM calculation). The calculations is checked and found in line with methodology.	iv) The error in the calculations has to be corrected in the PD. The issue is open. PJRCDM 3rd response Fuel consumption calculations needs to be checked. The issue is open PJRCDM 4th response Fuel consumption calculations needs to be checked. The issue is open PJRCDM 5th response: Fuel consumption calculations are revised. The issue is closed.
i) Build margin emission factor: PP needs to clearly state the period considered for the calculation build margin for the proposed project. In addition to that, please demonstrate how the choice is conservative at the time of project start date. PP needs to also clearly state whether the option selected for the build		i) The Section 4.2 is updated to state that build margin is used as per the latest available database for recent one year (2008-09 is used from Ver. 05 of database). This has to be monitored ex-post as per the requirement of the baseline methodology	i) Build margin emission factor will be monitored ex-post & latest available one year data will be used from latest CO2 baseline database. It is in line with the methodology AM 0029.But in section 3.3 of revised PD states that the Build margin emission

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
margin calculation. Would it be fixed exante for the first crediting period or would be updated expost during the crediting period?		AM0029 (pg. 6, line No. 2 and 3). The section 3.3 is updated to mention ex-post monitoring requirement consistently.	factor will be monitored ex-ante. Justify the discrepancies observed in the PD. The issue is open. PJRCDM 3rd response Section 3.3 of revised PD is updated to mention ex-post monitoring requirement consistently. The issue is closed
ii) PP also needs to demonstrate the same for the combined margin.		ii) Pg. 40 of the PD already given combined margin calculation (using 50:50 weight for BM of latest year and OM for last three year average). The BM calculation is updated by using BM values for three years up to four decimal places.	ii) Operating margin emission factor as stated in the PD is wrong. It comes to 986.7 tCO2e/GWh. Accordingly combined margin emission factor also comes to 902.3 tCO2e/GWh. PP to correct the same. The issue is open PJRCDM 3rd response The BM calculations are updated in the revised PD. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
iii) For calculating the emission factor of the technology to be used in the absence of project activity, PP has stated the efficiency of the system as 35.6% in the VCS PD and the emission factor has been calculated using the same. But, in the ER excel sheet, the efficiency of the system is stated as 33.6%. Pl clarify the difference.		iii) The efficiency and hence the emission factor of the technology to be used in the absence of project activity is updated in the revised PD, in line with the VER sheet.	iii) The efficiency of the technology used is in line with the VER excel sheet. The issue is closed
iv) PP is also required to clearly state the formula used to calculate the emission factor as per option 3 in section 4.1 of the VCS PD.		iv) The equations used are already given in the section 4.1 of the PD. The equations for the calculation are now given above each calculation.	iv) The formula used is to be stated in the PD. PD only states the values in the formula. The issue is open. PJRCDM 3rd response Revised PD states the formula used to calculate the emission factor as per option 3 in section 4.1 of the VCS PD. The issue is closed.
v) In addition to above, please also justify the source of data for fuel emission coefficient for coal (COEFBL) keeping in mind the requirement of the		v) The source is stated as below in the revised PD now. This is taken from national level data (CEA CO2 baseline database for Indian	v) Source of data for fuel emission coefficient for coal is stated in the revised PD. The issue is closed

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
methodology.		Power Sector, Database Excel Sheet, Assumptions worksheet, Cell D7).	
vi) In section 4.1, PP has provided a statement "The determination of baseline emissions will be made once at the validation stage based on an ex ante assessment, once again at the start of each subsequent crediting period (if applicable). If either option 1 (BM) or option 2 (CM) are selected, they will be estimated ex post, as described in "Tool to calculate emission factor for an electricity system". PJRCDM requests PP to state the option selected instead of providing the statement from the methodology.		vi) The choice is given in the revised PD as 'As per this requirement, as the Option 1 has lowest emission factor, this will be used as the emission factor for emission reduction calculations and will be monitored ex-post.'	vi) Ok. The issue is closed
vii) In calculation of baseline emissions using combined margin approach, the operating margin average value used needs to be rechecked. Accordingly, combined margin value also needs to be rechecked.		vii) The error was observed (due to use of values from database without decimal place restriction). The OM and hence CM values are updated in the PD and ER sheet now. The BM calculation is updated by using BM values for three years up to four decimal places.	vii) The OM & CM values are not yet updated in the revised PD. The issue is open PJRCDM 3rd response OM & CM values are checked & updated in the revised PD.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			The issue is closed.
Leakage calculation: viii) PP needs to clearly state the source of EF NG,upstream,CH4 in section 4.1 of the VCS PD. Also, please justify the choice of the value used in the emission reduction estimation keeping in mind the methodology requirement.		viii) The Section 4.1 is updated to include the source as the default specified in Table 2 of the baseline methodology AM0029. The sentence is modified to keep justification as 'value applicable to Rest of World' (countries for which a factor is not specified in the Table).	viii) Section 4.1 of the PD states EF NG,upstream,CH4: is used from the default specified in Table 2 of the baseline methodology AM0029, and value is 296 tCH4/ PJ. This is the highest value to be used for Rest of World for (which factor is not specified in the Table). PP to explain the meaning of the last sentence. The issue is open. PJRCDM 3rd response OK. The issue is closed.
ix) PP needs to justify how the calculation of the EFBL,upstream,CH4 i.e.upstream fugitive methane emissions in the absence of project activity (as presented in the excel sheet) is in line with the discussion provided in the VCS PD and also how the same meets the requirement of methodology AM0029. A clear description the above		ix) The methodology requirement (pg. 8), which is also stated in the PD is 'If EFBL,upstream,CH4 is determined based on the build margin or the combined margin, the calculation should be consistent with the calculation of CO2 emissions in the build margin and the combined margin, i.e. the same cohort of plants and data on fuel combustion and	ix) PD does not demonstrate the calculations for EF BL,upstream,CH4 i.e. fugitive methane emissions in absence of project activity. There is also no description provided in the PD. PP needs to provide a clear description with calculations in the PD.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
calculation needs to be provided in section 4.1 of the VCS PD.		electricity generation should be used, and the values for FF and EG should be those already determined through the application of "Tool to calculate emission factor for an electricity system". The ER calculation sheet can be referred that the same plants (included in the BM calculation – those commissioned in the last five years in Southern grid – 2003-08 are considered) and fuel data used for BM, CM calculation are linked for each fuel (coal, lignite; gas and oil). Thus, it meets the methodology requirement and statement is PD. Detailed leakage calculations in the baseline are given in the revised PD now.	The issue is open. PJRCDM 3rd response Revised PD includes detailed leakage calculation. The issue is closed
x) Further, since the requirement of the methodology is that the calculation of EFBL,upstream,CH4 should be in line with the approach followed for the calculation of baseline emissions (which in project scenario is based on build margin). And methodology also states that if the build margin or combined margin is used for the		x) As discussed above, the calculation uses same plants (included in the BM calculation – those commissioned in the last five years in Southern grid – 2003-08 are considered) and fuel data used for BM. The EFBL,upstream,CH4 to be monitored ex-post is already stated on pg. 38, Section 4.1.	x) PP needs to demonstrate the calculations of EF BL,upstream,CH4 in the PD. Also PP needs to display the source of data used in the PD. Calculations along with the support data needs to be clearly stated in the PD. The issue is open.

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
baseline emission calculations, in that case, the emission factor needs to be updated expost. Keeping this in mind, PJRCDM requests PP to clarify the approach to be followed during the crediting period regarding this emission factor for leakage calculation.		Detailed leakage calculations in the baseline are given in the revised PD now. The monitoring plan is updated to include discussion on EFBL,upstream,CH4 calculation and it is provided in the revised PD now. The discussion regarding calculation of EFBL,upstream,CH4 is now included on pg. 38 of PD.	PJRCDM 3rd response: The monitoring of EFBL, upstream, CH4 is yet to be included in the monitoring plan (section 3.3 of the VCS PD). Further, PJRCDM could not find any discussion regarding the monitoring of EFBL, upstream, CH4 on page 38 of the VCS PD. Pl check and include accordingly. The issue is open PJRCDM 4th response The discussion provided in the revised PD is correct. The issue is closed
xi) In section 4.1 of the VCS PD, PP has stated that "During the crediting period for fugitive CH4 emissions associated with NG, default values provided in Table 2 of the approved methodology AM0029 version 3 are used, as reliable and accurate national data are not available. The default values to be used in relation to NG production, processing, transport		xi) The sentence is updated to specify choice of highest value in the Table i.e. corresponding to Rest of World. The sentence is modified to keep justification as 'value applicable to Rest of World'.	xi) The justification in the sentence provided in the PD stating highest value in the Table is not acceptable. It should be only restricted to "Rest of the World". The issue is open PJRCDM 3rd response Justification provided in section

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
and distribution from Table 2 of AM0029 is US/Canada values for NG the gas transportation and distribution facilities would be built in near future and would be built as per the international standards" Please justify the relevance of this mind keeping in mind the values used in the ER excel sheet and also the requirement of the methodology.			4.1 of revised PD for EF NG,upstream,CH4 is appropriate. The issue is closed
xii) The discussion regarding the calculation of EFBL,upstream,CH4 as provided in VCS PD is not consistent and is not matching with the calculations as presented in the ER excel sheet. Pl check and revise the discussion in the VCS PD and demonstrate how the calculation of this parameter is in line with the option selected (Build margin) for baseline emission calculations.		xii) The PD has not give a detailed calculation as it is linked to the CEA database (for plants used in the build margin calculation) and is already given in the ER calculation sheet provided. As can be seen in the ER calculation sheet, last five year built plants in the Southern grid are separated and the fuel consumption of this is used to get the factor for EFBL,upstream,CH4. Detailed leakage calculations in the baseline are given in the revised PD now.	xii) The justification provided is not clear enough. ER sheet should clearly show the support data used & the same should be included in the PD. Data used to calculate EF BL,upstream,CH4 should be made clear & calculations should be included in the PD. The issue is open PJRCDM 3rd response Detailed calculations for EF BL,upstream,CH4 are reflected

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
			in the revised PD. The issue is closed.
CL-7 Stakeholders comments: i. In stakeholders concern Pt.No.1 In case of natural gas leakage the control vales automatically shutoff and thereby the gas supply to terminal station will be stopped. In case of chlorine gas leakages the control valves will close automatically. In case of chlorine spillages occur it will be absorbed by sodium hydroxide tower and neutralized. This has been included in emergency plan and mock drills are conducted. Provide mock drill records	5.0	The mock drill records are being submitted now.	The mock drill records are submitted. The issue is closed.
CL-8 i. The Chronology provided is not adequate. Date of initiation, commissioning etc. have not been included here. Supporting evidences are also required for all the events Provide the evidences & include the above events in the chronology.	6.1	i) Other project implementation milestones like EPC contract signing, PPA signing, NTP to EPC contractor (go ahead for construction with first advance of payment) are added in the chronology in Section 7 of the revised PD.	i) Date of initiation & commissioning is not included in the revised PD. The issue is open PJRCDM 3rd response Date of initiation &

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
ii. As per Section 5 of VCS PD, Stakeholder consultation was carried out on 01/12/2007 which do not match with the date 04/12/2007 provided here. Correct the date in the PD		The date of initiation (construction start) and commissioning of plant is included in the PD now. ii) The table is modified to include correct date i.e. 01/12/2007. The minutes of the meeting are already submitted to DOE.	commissioning date is included in the revised PD. The issue is closed ii) The table is modified to include the correct date of minutes of meeting as 01/12/2007. The issue is closed.
CL-9 PP name is not consistent in the PD. At some places, it is GVK industries while at other places it is GVKIL. Pl check and revise accordingly.		The name of PP is made consistent to GVK Power & Infrastructure Limited. Note the name at the time of EPC and all earlier contracts was GVK Industries Limited.	Name of PP is made consistent as GVK Power & Infrastructure Limited in the revised PD. The issue is closed.
CL-10 Emergency Monitoring Plan: Provide Emergency Monitoring plan which mainly covers 1.Emergency gas alarm system at GAIL terminal 2.Include Total Power failure scenario in the PD. 3.Include Scenario of failure of both the energy meters (main & check) in the PD.		An emergency plan is included in the Section 3.4 of the revised PD. Following scenarios/ points are covered therein 1) Both electricity meters (main and check) failure 2) Failure of gas flow meter 3) Gas leakage detection 4) Complete power failure scenario 1) One heading is removed and now only	Emergency plan is stated at two different places in section 3.4 of the revised PD.PP to incorporate the same in one Emergency plan. 1) In case both the meters fail PP should state how the electricity generated will be monitored. The emergency plan states that the meters will be replaced. PP has to clearly specify the duration

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		one section refers to emergency plan. 2) As per gas supply agreement, Article 18: Indemnities, the responsibility of leakages is in control of GAIL before point of delivery. The responsibility of PP is after point of gas delivery and PP has maintained the gas detectors in the plant premises. 3) In case of complete power failure, the PP will use a 380 kVA diesel based generator (Att. 10- DG set name plate)	during which the meters are replaced in the PD. 2) Records are to be provided for gas leakage testing at the GAIL terminal. 3) PP to provide testing records for "complete power failure scenario". The issue is open. PJRCDM 3rd response 1) Revised PD includes emergency plan in one heading. 2) PP has installed gas detectors in the plant premises. 3) In case of complete power failure, 380 kVA DG set will be used. The issue is closed.