



VALIDATION REPORT GUL AHMED TEXTILE MILLS LIMITED

VALIDATION OF THE GUL AHMED COMBINED CYCLE GAS TURBINE PROJECT

REPORT No. PAKISTAN-VAL/0001/2008

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VALIDATION REPORT

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Client: Gul Ahmed Textile Mills Limited	Client ref.: Mr. Riazat Hussain

Summary:
Bureau Veritas Certification has made the validation of the “Gul Ahmed Combined Cycle Gas Turbine Project” project of Gul Ahmed Textile Mills Limited located in Gul Ahmed Textile Mills Unit No. 1, Landhi in Karachi City, Sindh Province, Pakistan on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

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

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

In summary, it is Bureau Veritas Certification’s opinion that the project correctly applies the baseline and monitoring methodology Type II.D (AMS-II.D) Version 11 and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.: PAKISTAN -val/0001/2008	Subject Group: CDM
Project title: Gul Ahmed Combined Cycle Gas Turbine Project	
Work carried out by: R. Sankaranarayanan - Team leader Imran Altaf Bhatti - Team Member Abul Kalam Siddiqui – Team Member Khalid Ajaz – Sector Specialist Ahsan Elahi Vohra – Finance Specialist	
Work verified by: H B Muralidhar	
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Abbreviations change / add to the list as necessary

GTML	Gul Ahmed Textile Mills Limited
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
DOE	Designated Operational Entity
GHG	Green House Gas(es)
I	Interview
IETA	International Emissions Trading Association
MoV	Means of Verification
NGO	Non Government Organization
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual
OEM	Original Equipment Manufacturer



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1 INTRODUCTION

Gul Ahmed Textile Mills Limited has commissioned Bureau Veritas Certification to validate its CDM project “Gul Ahmed Combined Cycle Gas Turbine Project” (hereafter called “the project”) at Karachi, Sindh Province, Pakistan.

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

1.1 Objective

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

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

1.2 Scope

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

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

1.3 Validation team

The validation team consists of the following personnel:

R. Sankaranarayanan
Bureau Veritas Certification Team Leader, Climate Change Verifier

Imran Altaf Bhatti
Bureau Veritas Certification Climate Change Verifier



Abul Kalam Siddiqui
Bureau Veritas Certification Climate Change Verifier

H B Muralidhar
Bureau Veritas Certification, Internal reviewer

2 METHODOLOGY

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

In order to ensure transparency, a validation protocol was customized for the project, according to the version 01 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 44 meeting on 28/11/2008. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

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

2.1 Review of Documents

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

To address Bureau Veritas Certification corrective action and clarification requests Gul Ahmed Textile Mills Limited revised the PDD and resubmitted it in 09/2009.

The validation findings presented in this report relate to the project as described in the PDD version 14.

2.2 Follow-up Interviews

On 25/02/2008 and 26/02/2008 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Gul



Ahmed Textile Mills Limited were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Gul Ahmed Textile Mills Limited	<ul style="list-style-type: none"> ➤ Project description ➤ Contribution of Project towards Sustainable Development ➤ Operational aspects ➤ Monitoring Methodologies, plans and Procedures. ➤ QA/ QC Procedures ➤ Internal review / verification mechanism ➤ Competency Management ➤ Approach towards understanding the issues pertaining to interested parties ➤ Base line & Additionality – Justification and Application ➤ Monitoring plans
LOCAL Stakeholder	<ul style="list-style-type: none"> ➤ Social and economical benefits due to Project.
CONSULTANT (EcoSecurities International Limited)	<ul style="list-style-type: none"> ➤ Project Category ➤ Base line & Additionality – Justification and Application ➤ Monitoring plans

2.3 Resolution of Clarification and Corrective Action Requests

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

Corrective Action Requests (CAR) is issued, where:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

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



3 VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 06 Corrective Action Requests and 10 Clarification Requests.

The number between brackets at the end of each section correspond to the VVM paragraph

3.1 Approval (49-50)

Letters of approval have been received and the following support documentation is available:

- Approval from DNA, Ministry of Environment, Government of Pakistan dated, December 29, 2008. (Ref F.No.1(13)-CDM/2006)
- Approval from DNA, Department for Environment, Food and Rural Affairs, United Kingdom, dated, January 27, 2009. (ESG/03/2009)

Bureau Veritas Certification received this letter from the project participants and does not doubt its authenticity.

Bureau Veritas Certification considers the letters are in accordance with paragraphs 45 - 48 of the VVM.

3.2 Participation (54)

The participation for each project participant has been approved by a Party of the Kyoto Protocol.

The validation team concluded this by reviewing the information available on the website of United Nations Framework Convention on Climate change (UNFCCC) as well as through the letter of approvals issued by the Designated National authorities of Pakistan and United Kingdom.

3.3 Project design document (57)

The validation team hereby confirms that the PDD complies with the latest forms and guidance documents for completion of PDD.

3.4 Project description (64)

The process undertaken to validate the accuracy and completeness of the project description included document review of the project activity to identify issues that are of



potential relevance to the project activity. The validation team reviewed the project activity documents, to ensure that they meet the established validation criteria, including the approved methodology used in it, and work out a checklist for on site validation.

The lifetime of the project equipment is 25 years. This was communicated by the manufacturer Turbomach to the project participant (e-mail communication dated 27/5/2008) – please refer to Figure 8, p. 49, PDD version 14. Within the same e-mail it has been further declared that two gas turbines being used at Sui Northern Gas pipelines have completed 42 and 39 years of operations and are still in use. Two gas turbines used by another textile mill (Al Karam Textile) have completed 25 years. Since it has to be established that all the baseline equipment can be operated beyond the crediting period of the project. Waukesha gas engines have been installed in 1989. In the letter from Masco to project participant dated 22/05/2008 (Figure 4, p. 45, PDD version 14) it was stated that the Waukesha gas engines are required to be overhauled after every 72,000 hours (10 years) and four overhauls are a normal feature. General overhaul of Wartsila Engines had been performed after completion of 64,000 hours and in the communication by manufacturer Wartsila to project participant (e-mail communication dated 30/5/2008, as in Figure 9, p. 50, PDD version 14), the manufacturer comments that the life of engines cannot be established but similar engines have been operating for 30 years. Similar condition is being referred for boilers, where the life expectancy cannot be established. The life of baseline equipment as indicated in technical literature is dependent on timely preventive maintenance based on the maintenance schedules provided by the manufacturer. This was substantiated by the Sector Specialist (Mr. Khalid Ajaz) during the Validation site visit by DOE.

The timeline of overhaul of all the baseline equipment is as follows:

Waukesha Engines	Running hours	Recommended major overhaul hours	Major overhaul cost [~US \$]	Remarks	Status
Engine No. 1	109593	72000	60,000 of each engine	Waukesha engines have undergone Major overhauls at various times between 60 to 80 thousand hours of operation. Additionally, three overhauls may be undertaken as per Waukesha	Engine No.s 1, 3, 4, and 5 are on standby and engine No.s 2, 7, 8, and 9 are in operation subject to power requirements
Engine No. 2	120091	72000			
Engine No. 3	117733	72000			
Engine No. 4	115696	72000			
Engine No. 5	123064	72000			
Engine No. 7	83281	72000			
Engine No. 8	88526	72000			
Engine No. 9	73253	72000			

Wartsila Engines	Running hours	Recommended major overhaul hours	Major overhaul cost [~PKR]	Remarks	Status
Engine No. 1	73295	64000			



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Engine No. 2	80812	64000	engine	overhaul, and as such the next overhaul will not be due till 2020 and 2023 if it continues operation at 4,300 hrs/yr (in line with past operational practice). At the end of this period another major overhaul will extend the engine life by a further 64,000 hrs taking it beyond 2030 (the baseline lifetime in the PDD). This is as per Waukesha who state that an additional 3 overhauls can be performed.	
Gas Fired Boilers	Recommended Major Overhaul Hours		Major overhaul cost [~PKR]	Status	
Boiler No. 1	Once per Year		50,000 of each Boiler	On stand by	
Boiler No. 2	Once per Year				
Boiler No. 3	Once per Year				

Following the document review, site visit/ meeting with consultants was performed. The validation team identified and reviewed additional questions and issues that need to be addressed with the project designers. The site visit also covered interviews of key stakeholders that had important comments to provide.

Based on document review, site assessment and interviews, the validation team identified issues that need to be addressed by the project participants. These issues were reported as corrective action requests or clarification requests. The project participants were requested to respond to these findings. This involved change in the PDD.

A draft validation report was issued which encompassed the list of clarification and corrective action requests.

Upon receipt of responses and comments to clarification and corrective action requests from representatives of the project activity, the draft report was revised to reflect the response to corrective action requests, discussions and revisions to project documents.

To ensure that the report meets standards of transparency, it was ensured that all assumptions are identified. A background material was clearly referenced and confidential material was appropriately marked.

The DOE hereby confirms that the project description in PDD (Version Number 14) is accurate and complete in all respects.



3.5 Baseline and monitoring methodology

3.5.1 Baseline and monitoring methodology

The steps taken to assess the relevant information contained in the PDD against each applicability condition are described below.

Applicability condition (a): “Gul Ahmed Combined Cycle Gas Turbine Project” uses the approved baseline methodology AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”.

The applicability of the methodology has been discussed in section B 2 of PDD. The project activity of GTML involves energy efficiency and fuel switching measure at a single industrial facility and utilization of natural gas as fuel to generate electricity and steam. Natural Gas is the only fuel, no other start up fuels are used.

Electricity and steam generated from the proposed project activity will be supplied internally to units 1, 2, 3 of GTML. The baseline of this project is clearly identifiable and the data for baseline estimation and the CO₂ emission factor is available.

The project replaces existing equipment and the aggregate energy savings are 147 GWh/yr which is below the small scale threshold of 180 GWh/yr.

The DOE performed document review of PDD, site visit and interviews with the project participants to validate applicability of baseline and monitoring methodology and information regarding project boundary, identification of baseline, emission reduction formulae and calculations, conditions for additionality and description of monitoring plan for the project. The DOE also compared the methodology used by project participants with the actual version of methodology available on UNFCCC website. The DOE hereby confirms that the selected baseline and monitoring methodology AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities” is previously approved by the CDM Executive Board, and is applicable to the project activity, which, complies with all the applicability conditions therein.

The DOE validated that the project activity can directly measure and record the energy use within the project boundary and that the impact of measures implemented by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity.

The DOE hereby confirms that the greenhouse gas emissions occurring within the proposed CDM project activity boundary are a result of the implementation of the proposed CDM project activity. The DOE also confirms that this CDM project activity does not contribute to greenhouse gas emissions that are more than 1% of the overall expected average annual emissions reductions that are not addressed by the applied methodology.



3.5.2 Project boundary (79)

The project activity involves the replacement of existing equipment with more efficient equipment through the development, design, engineering, procurement, financing, construction, ownership, operation and maintenance of a 10MW combined cycle gas turbine facility for generation and supply of electricity and steam using Natural Gas as fuel. Electricity and steam generated by the project activity will be fed into units 1, 2, 3 of Gul Ahmed Textile Mills Limited for the internal requirement of steam and electricity required in textile manufacturing operations situated in the same vicinity.

The project is divided into three phases:

- 1) Installation of 10.3 MW gas turbine.
- 2) Installation of 30tph waste heat recovery boiler.
- 3) Installation of 3.4 MW steam turbine.

The phases 1 and 2 are complete while phase 3 is under review and selection and evaluation of technology/ equipment and supplier.

The DOE validated the project boundary by performing a detailed site tour and reviewed the operations of 10.3 MW gas turbine and 30tph waste heat recovery boiler, which were effectively functional. The equipment such as gas generators, furnace oil based engines and generators and gas-fired boiler which will be not used after project completion were also reviewed.

Documents including correspondence with suppliers, quotations, purchase orders, letters of credit, bills of lading, site progress reports, commissioning reports, daily equipment log sheets, preventive/ shutdown maintenance plans and records were available in original and were reviewed during the visit by the validation team.

During the site visit, the DOE validated that the existing equipment which included ten gas generators, two engines operating on furnace oil and three gas-fired boilers were decommissioned but were kept and maintained for emergency purposes.

Based on the above assessment, the DOE hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity.

3.5.3 Baseline identification (86-87)

The steps taken to assess the requirement given in paragraph 80 and 81 of the VVM are described below:

“Gul Ahmed Combined Cycle Gas Turbine Project” uses approved baseline methodology AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”.

The PDD identifies the continuation of existing equipment which comprises of ten 0.625 MWe gas engines, two 4.0 MWe engines running on furnace oil and two 15 tph and one 8tph gas-fired boilers, as baseline scenario that represent the anthropogenic



emissions by sources of GHGs that would occur in the absence of proposed CDM project.

AMS-II.D (version 11) states that in case of replacement, modification or retrofit measures, the baseline consists of the energy baseline of the existing facility or sub-system that is replaced, modified or retrofitted. The DOE verified and confirms that “Gul Ahmed Combined Cycle Gas Turbine Project” replaces existing equipment identified above and results in increasing the efficiency compared to the existing system and using exclusively natural gas, which is less carbon intensive than heavy fuel oil.

AMS-II.D (version 11) also states in absence of CDM project activity, the existing facility would continue to consume energy at historical average level until the facility is replaced, modified or retrofitted. The DOE verified and confirms that in absence of “Gul Ahmed Combined Cycle Gas Turbine Project”, the facility would have continued electricity and steam generation from existing equipment as this equipment was found to be in sound working condition and regular preventive maintenance was performed as per OEM schedules. The DOE verified the equipment log sheets, maintenance schedules and maintenance reports during the site visit.

M/s Gul Ahmed Textile Mills Limited has supply arrangements with SSGC (Sui Southern Gas Company Limited) which is the only entity responsible to supply natural gas to domestic and industrial consumers in Sindh Province. SSGC has approved and ensured gas quantities required for fulfilling this gas based economy vision to be available in the envisaged time frame. Based on SSGC’s commitment for supply of natural gas and availability of heavy fuel oil, the generation of power and steam using existing equipment (which is also maintained in sound condition) is the most feasible option for GTML.

The baseline options considered do not include those options that:

- do not comply with legal and regulatory requirements.

The baseline identification was found to be performed in accordance with AMS-II.D (version 11). The existing electricity and steam generation equipment was found to be recent, the major overhaul of the equipment has been performed as per the schedules and equipment is being maintained according to the industry standards. The compliance with operating requirements and maintenance schedule will result in continuation of usage of existing equipment till the end of its technical lifetime in line with legal requirements. The input data, assumptions, calculations and the resultant figures in the PDD have been assessed independently by the validation team and found OK. The validation team also validated the remaining lifetime of equipment by reviewing service reports, recommendations from OEMs and technical expert’s opinion.

Based on the site visit, review of documents and interviews with maintenance and operations staff, the DOE hereby confirms that all the assumptions and data including references and sources used by the project participants are listed in the PDD. All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of



the baseline scenario and remaining lifetime of the existing equipment are justified appropriately, supported by evidence and can be deemed reasonable.

The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity. The DOE verified and confirms by cross checking the requirements of latest version of AMS-II.D (version 11) available on UNFCCC Website with the description of project activity provided in PDD. The site visit, document review and interviews with project participants also substantiate the correctness of application of the baseline methodology.

3.5.4 Algorithms and/or formulae used to determine emission reductions (91-92)

The steps taken to assess the requirement outlined in paragraph 88 the VVM are described below:

As per AMS II.D, IPCC default values for emission coefficients may be used which were found utilised for baseline emission calculated for replaced equipment (three boilers running on natural gas for steam generation, and electricity generation by a mix of gas-fired and oil-fired engines). The values were also considered for the operation of combined cycle gas turbine for calculation of project emissions. Oil and natural gas consumptions were found established and verified.

The validation team reviewed and verified the formulae and calculations of emission reductions which were established in line with AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”.

Based on the review of PDD, ER calculations and site visit, the DOE hereby confirms that assumptions, data, IPCC default values including references and sources used by the project participants are listed in the PDD. All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered relevant to the proposed CDM project activity. Calculation of baseline emissions, project emissions, emission reductions found inline with AMS-II.D (version 11). All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

3.6 Additionality of a project activity (95)

The steps taken, and sources of information used, to cross-check the information contained in the PDD on this matter are described below:

Additionality has been discussed considering barriers due to prevailing practice and investment barrier. The arguments to justify the assessment of additionality are addressed in Section B 5 of PDD – Version 14, dated 24/10/2010, which has been assessed by the validation team.



On analysing data it is observed that the project activity is not the most economical option for electricity and steam production. Using existing equipment and increasing the number of engines and boilers to meet the increasing demand is economically the most feasible investment for GTML as well it is prevailing practise in Pakistan specifically in Textile sector. In all the above options, the GHG emissions will be more than the project option.

Gul Ahmed Textile Mills Limited has performed investment analysis by calculating internal rate of return according to internal and external benchmarking.

The internal benchmark for IRR applied by Gul Ahmed for this project is 18%. The source of this benchmark is Discount Rate applied by State Bank of Pakistan which was 9% at the time of project feasibility. Since the investment in the project activity is mainly equipment and technology not involving the cost of land, therefore the IRR set on the project is twice the discount rate of State Bank of Pakistan. This rationale has been established and adopted by the Management of Gul Ahmed Textile Mills Limited. This benchmark has been consistently used at Gul Ahmed for determining the feasibility of new projects. The discount rate of State Bank of Pakistan was 7.5% between June 2001 and April 2005, and increased to 9% in April 2005. Therefore, the benchmark IRR when the Project was submitted was 18%. This is obviously higher than the commercial lending rates in Pakistan (which are slightly above the state bank discount rate), but substantially lower than typical market returns in Pakistan, which averaged approximately 40% annually between 2000 and 2006 on the Karachi Stock Exchange.

The external benchmark is calculated on weighted average cost of capital (WACC) by Gul Ahmed and for this project it is 15.6%. The source of this benchmark is based on equity return which is calculated by using risk free rate (computed at 11% derived from Government Bond Rates), equity/ country premium (computed at 18.6% derived from market data which is taken for 15 years period) and beta (computed at 0.92 derived from power sector of Pakistan). The equity return thus calculated on these three factors is 28%. Weighted average cost of capital (WACC) is computed on the basis of proportion of debt (computed from company's balance sheet), proportion of equity (computed from company's balance sheet), cost of debt (computed from company's loan terms), equity return and effective tax rate.

The sources of data for Government Bond Rates, market, beta (textile sector, power sector, power sector – Pakistan, textile sector Pakistan) are described in detail in section 3.6.3.

The IRR of the project at feasibility stage was calculated to be 14% without carbon credit and 17.10% with carbon credit which makes this project feasible and attractive only on the basis of CDM approval.

The validation of sources, data and values used for equity return, weighted average cost of capital (WACC) and assumptions indicated in the IRR computation was performed by Finance Specialist Mr. Ahsan Vohra who is a Chartered Accountant and provides financial services through his establishment Ahsan Vohra & Co. in accordance



with related services applicable to agreed upon procedures engagements. The IRR calculated in the annexed worksheets of PDD version 14, dated 24/10/2010, has been accurately computed, in accordance with generally acceptable IRR computation principles and in accordance with EB guidance on assessment of investment analysis.

The DOE reviewed Gul Ahmed Textile Mills Limited approach of applying internal and external benchmarking for determination of IRR. The internal benchmarking was solely dependent on management's decision therefore this approach was not agreed by the DOE.

Gul Ahmed Textile Mills Limited performed calculation of IRR based on external benchmark which depends on weighted average cost of capital (WACC) computed on the basis of proportion of debt (computed from company's balance sheet), proportion of equity (computed from company's balance sheet), cost of debt (computed from company's loan terms), equity return and effective tax rate. This approach and financial indicators were transparent, credible and demonstrable. The validation team understands that this benchmark is suitable for this project and for the type of the financial indicator presented, i.e., project IRR. Therefore VVM, paragraph 110 (a) has been satisfied.

Return on equity which is calculated by using risk free rate (derived from Government Bond Rates), equity/ country premium (derived from market data which is taken for 15 years period) and beta (derived from power sector of Pakistan) provide a source of external benchmarking. The calculations reflect the risks associated with the project type as the project activity requires capital investment mainly in equipment and technology which is dependent on Gul Ahmed Textile Mills Limited financial ability to provide resources in terms of equipment, technology and competent and trained manpower. Therefore VVM, paragraph 110 (b) has been satisfied.

In consultation with Finance Specialist, the DOE concluded that Gul Ahmed Textile Mills decision for investment in the project activity at a rate of return lower than the calculated benchmark was not possible. This was further substantiated during the interview with the management of Gul Ahmed Textile Mills Limited. The process of applying internal benchmark was performed for projects related to production and efficiency enhancement and IRR set on these projects was around twice the discount rate of State Bank of Pakistan, which is higher than the WACC. In the past the project participant has used a benchmark that is higher than the WACC. Therefore using the WACC as the benchmark in the additionality assessment is a conservative approach.

This was the first instance that Gul Ahmed Textile Mills Limited has used external benchmarking for a project activity. Therefore VVM, paragraph 110 (c) has been satisfied.

The validation team assessed the investment analysis independently and it is accepted that only CDM revenues can make this project feasible for adoption.



The validation team verified the detailed working and observed that the project is not financially viable without CDM revenue.

3.6.1 Prior consideration of the clean development mechanism (102)

GTML considered an environment friendly power generation option in the year 2004. However this was not feasible due to high investment and decision of continuation of existing equipment for power generation was made. In 2005, GTML received information about CDM and again considered the project activity in light of revenue from CDM. In July 2005, the project was approved. During last quarter of 2005, 2006 & 2007 designing of project, equipment selection, arrangement for funds, installation and commissioning was performed. On February, 25 & 26, 2008, Bureau Veritas Certification performed the site visit.

The DOE validated the project activity start date provided in the PDD as 27/05/2005, which is the contract signing date for the gas turbine purchase, and is the earliest date of real action of the project activity, and therefore in compliance with the "Project activity start date" as per the CDM Glossary of Terms. Prior consideration was validated by reviewing email received by GTML by their consultants, who apprised them about CDM option for financing energy efficiency projects. Also consideration of CDM was evident through management committee meeting minutes and project approval dated 05/06/2005 and 07/07/2005 respectively. This was further validated by contract with gas turbine and waste heat recovery boiler manufacturer and letter of credit issued from the bank.

Based on the above assessment, the DOE hereby confirms that the proposed CDM project activity complies with the requirements of EB41.

3.6.2 Identification of alternatives (105)

The identification of alternatives is not applicable since AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities” already provides the baseline scenario.

3.6.3 Investment analysis (112)

The IRR calculated is a “project IRR”, and as per paragraph 12 of the “Guidelines on the Assessment of Investment Analysis” (EB 51, Annex 58), local commercial lending rates or a weighted average cost of capital (“WACC”) are appropriate benchmarks for a project IRR. Accordingly, external WACC has been chosen as the benchmark, and this is appropriate for a project IRR, and it is in line with paragraphs 111 of VVM ver 1.1, and paragraph 12 of EB 51 Annex 58. The benchmark has been calculated using publicly available data in line with paragraph 13 of EB 51, Annex 58.

The WACC is calculated as the weighted average cost of equity and cost of debt. The expected cost of equity in the project type is calculated based on the Capital Asset Pricing Model (“CAPM”) using publicly available financial data. The required rate of return on equity is calculated as the risk free rate plus beta, multiplied by the risk



premium (where beta represents the risk involved in the project type). This method is in accordance with the additionality tool since the benchmark is based on official publicly available financial data (based on parameters that are standard in the market). Hence, this approach for calculating the benchmark was validated. Each of the parameters used in the calculation of the WACC was checked for appropriateness as listed below.

Risk free rate (rf = 11.0%): This was taken from the average coupon of Pakistan government 10-year bond rates between 2001 and 2004 (http://www.paksearch.com/Government/SBP/SBP_Annual/2002-03/Money%20and%20Credit.htm) & (<http://www.sbp.org.pk/reports/annual/arfy06/Chp-5.pdf>). The risk free rate is taken from publicly available State Bank of Pakistan data, which is the Central Bank and therefore reliable. It was applicable at the time of decision making and was therefore validated.

Beta: Various beta values were examined by project participant as detailed below. It may be noted that beta values for the power generation sector in emerging economies, textile products sector in emerging economies, and textile products sector listed on the Karachi Stock Exchange were taken from an analysis by Professor Damodaran of New York University's Stern School of Business (<http://pages.stern.nyu.edu/~adamodar/>). This analysis is based on data that was available in January 2005 and is therefore applicable at the time of decision making. New York University's Stern School of Business is among the most highly regarded worldwide. This source does not include data on any companies in the power generation sector in Pakistan, so as an additional cross check, Bloomberg snapshots were also considered by project participant for four power generating companies in Pakistan. Bloomberg is a privately held financial software, news, and data company, and internationally respected as an authority.

Beta	Value of Beta	Source
Beta values of power generation for emerging economies	0.97	http://www.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm04.xls
Beta value of textile products for emerging economies	0.95	http://www.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm04.xls
Beta value for textile products from Karachi Stock Exchange	1.06	http://www.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm04.xls
Beta value for power generation from Karachi Stock Exchange	0.92	Bloomberg snapshots (average of 4 companies)

The Beta value of 0.92 was the most conservative of the above four values, and was derived from power generating companies and sourced from Bloomberg, and was accepted.

Risk premium: Calculated as the difference between the market return and the risk free rate. The market return is derived from publicly available data of average returns of the Karachi Stock Exchange for the 15-year period 1990-2005 (Karachi Stock Exchange data is available on Bloomberg Finance (Bloomberg Finance L.P.). Since the market return is calculated based on publicly available Karachi Stock Exchange data, and represents an average market return for 15 years (a long and representative period). This value accurately represents the risk premium in the host country and is applicable at the time of decision making, and hence was accepted.

Debt equity ratio: Debt equity ratio was taken from the publicly available Gul Ahmed balance sheet (<http://www.gulahmed.com/PDF/annual/Annual%20Report%202006.pdf>). There is no standard publicly available debt equity ratio for companies in the textile sector in the host country, so the project participant also examined debt equity ratio for companies in the textile sector in emerging countries which was 68:32 (<http://www.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm05.xls>). The Gul Ahmed debt equity ratio of 74:26 was more conservative. Hence this value was accepted for WACC calculation.

Cost of debt: Cost of debt was taken from project participant loan terms from different banks (United Bank Ltd. interest rate of 11.5%; National Bank of Pakistan Loan 1 interest rate of 11.25%; National Bank of Pakistan Loan 2 interest rate of 11.5% etc.) as detailed in Excel file 'external benchmark.xls'.

Interest rates payable by project participant were 1.25 to 1.5% above the Karachi Interbank Offered Rates (KIBOR) interest rates, so an interest rate of 11.25% was used as cost of debt. The external benchmark should be based on parameters that are standard in the market, so it was deemed appropriate that interest rates considering various loans would be more representative of cost of debt rather than considering only one interest rate. Hence the value of 11.25% was accepted as cost of debt for calculation of WACC.

It may be noted that interest rates of the above banks are either based on the State Bank of Pakistan interest rate or Karachi Interbank Offered Rates (KIBOR). The State Bank of Pakistan interest rate was 9%, while Karachi Interbank Offered Rates (KIBOR) was State Bank of Pakistan interest rate + 1% (i.e. 10%). State Bank of Pakistan is the central monetary bank of Pakistan which has the function of regulating banking and hence interest rate of KIBOR (which is interest rate of State bank of Pakistan + 1%) was considered appropriate for the IRR analysis. Thus, the interest rate in the IRR calculations presented in the Feasibility Report was taken as 10%. Using 10% rather than 11.25% in the IRR calculation gives a higher IRR, therefore the interest rate of 10% was accepted as it is more conservative.



The validation team validated the correctness and authenticity of the data used for the WACC calculation and found them to be correct and publicly available. Furthermore, this is in line with guidelines for benchmark selection stipulated in the “Guidance on the Assessment of Investment Analysis”, EB 51 Annex 58. Hence the benchmark was accepted and validated.

The external benchmark Weighted Average Cost of Capital (WACC) for this project is 15.6%. The WACC is calculated as the weighted average cost of equity and cost of debt as explained above.

The equity return thus calculated on these three factors is 28%. Weighted average cost of capital (WACC) is computed on the basis of proportion of debt (computed from company’s balance sheet), proportion of equity (computed from company’s balance sheet), cost of debt (computed from company’s loan terms), equity return and effective tax rate. The IRR of the project at feasibility stage was calculated to be 14% without carbon credit and 17.10% with carbon credit which makes this project feasible and attractive only on the basis of CDM approval.

The validation of sources, data and values used for equity return, weighted average cost of capital (WACC) and assumptions indicated in the IRR computation was performed by Finance Specialist Mr. Ahsan Vohra who is a Chartered Accountant and provides financial services through his establishment Ahsan Vohra & Co. In accordance with related services applicable to agreed upon procedures engagements. The IRR calculated in the annexed worksheets of PDD version 14, dated 24/10/2010, has been accurately computed in accordance with generally acceptable IRR computation principles.

Input values used in the IRR calculations were applicable at the time of decision making. This is in line with paragraph 6 of the “Guidelines on the Assessment of Investment Analysis” (EB 51, Annex 58). Input values used in the IRR calculations including cost of equipment have been validated as follows.

Input Parameter, Value	Source	Validation justification
Power Requirement, 10,000 KWh	Plant Log Sheets & Operating Reports	Data of actual operations of HFO engines and gas engines is available and maintained by GTML in a credible and transparent manner. It reflects the value applicable at the time of decision making. This is in line with paragraph 6 of the “Guidelines on the Assessment of Investment Analysis” (EB 51, Annex 58).
Steam Requirement, 22 TPH	Plant Log Sheets & Operating Reports	Data of boiler operations is available and maintained by GTML in a credible and



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Input Parameter, Value	Source	Validation justification
		transparent manner, and reflects values applicable at the time of decision making. This is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Hot Water Requirement, 800 m ³ /day	Plant Log Sheets & Operating Reports	Data of boiler operations is available and maintained by GTML in a credible and transparent manner and reflects the value applicable at the time of decision making. This is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Annual Hours, 8,500	Plant Log Sheets & Operating Reports	Operational hours of HFO and gas engines and boilers corroborate operating hours, reflecting a value applicable at the time of decision making. This is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Furnace Oil Consumption 238g/KWh	Previous HFO Purchase Orders & Plant Log Sheets	Feasibility Report based on the consumption rate, which is determined from actual HFO consumption identified in plant log sheets, and therefore reflects a value applicable at the time of decision making. This is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Lube Oil Consumption, 0.0012 Kg/ KWh	Previous Lube Oil Purchase Orders & Maintenance Records	Feasibility Report based on consumption rate, which is determined from the actual lube oil consumption identified in maintenance sheets. It reflects a value applicable at the time of decision making and is in line with paragraph 6



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Input Parameter, Value	Source	Validation justification
		of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Gas Consumption for Gas Generator, 0.39 m ³ /KWh	Plant Log Sheets & SSGC Monthly Gas Bills	Feasibility Report based on the consumption rate, which is determined from actual gas consumption calculated through SSGC monthly gas bills. It reflects value applicable at the time of decision making, and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Gas Consumption for Gas Turbine, 0.41 m ³ /KWh	Manufacturer data from supplier	Feasibility Report based on manufacturer data provided by Turbomach at the time of decision making. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Gas Consumption for Old Steam Boiler, 93.95 m ³ /KWh	Plant Log Sheets & SSGC Monthly Gas Bills	Feasibility Report based on consumption rate, which is determined from actual gas consumption calculated through SSGC monthly gas bills. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Gas Consumption for Waste Heat Recovery Boiler, 74.68 m ³ /KWh	Manufacturer data from supplier	Feasibility Report based on data provided by WHRB manufacturer at time of decision making.
Gas Price, PKR 6.65/m ³	SSGC Monthly Gas Bills	Feasibility Report is based on gas rate determined from the actual SSGC monthly gas bills. It reflects value applicable at the time of decision making, and is in line with paragraph 6



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Input Parameter, Value	Source	Validation justification
		of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Lube Oil Price, PKR 115.40/Kg	Lube Oil Manufacturer Quotations & Previous Purchase Orders (prior to decision making)	Feasibility Report based on lube oil rate determined from actual purchase orders. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Furnace Oil Price, PKR 16400/Ton	Lube Oil Supplier Quotations & Previous Purchase Orders (prior to decision making)	Feasibility Report based on furnace oil rate, determined from actual purchase orders. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of Energy per Unit from Gas Turbine, PKR 3.73	Project Feasibility Report	Calculations based on gas consumption provided by manufacturer, and associated costs calculated by GTML in a transparent manner. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of energy per unit from Waste Heat Boiler, PKR 698	Project Feasibility Report	Calculations based on gas consumption data provided by the manufacturer, and associated costs calculated by GTML in a transparent manner. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).



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Input Parameter, Value	Source	Validation justification
Cost of energy per unit from Furnace Oil Generator, PKR 4.28	Project Feasibility Report	Calculations based on actual furnace oil consumption and associated costs calculated by GTML in a transparent manner. It reflects value applicable at the time of decision making and is in line with para 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of energy per unit from Gas Generator, PKR 2.81	Project Feasibility Report	Calculations based on actual gas consumption and associated costs calculated by GTML in a transparent manner. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of energy per unit from Old Steam Boiler, PKR 628	Project Feasibility Report	Calculations based on actual gas consumption and associated costs calculated by GTML in a transparent manner. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of Gas Turbine, PKR 230,000,000	Project Feasibility Report & Request for approval of Project	Request for approval dated 05/06/2005 included the cost of equipment. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).



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Input Parameter, Value	Source	Validation justification
Cost of Compressor, PKR 37,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the cost of equipment. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of Boiler, PKR 75,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the cost of equipment. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of Chiller, PKR 18,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the cost of equipment. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of Water Treatment Plant, PKR10,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the cost of equipment. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of auxiliaries, PKR	Project Feasibility Report	Request for approval dated

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Input Parameter, Value	Source	Validation justification
15,000,000	& request for approval of Project	05/06/2005 included the cost of equipment. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of civil work, PKR 16,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the cost of civil works. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Erection & installation Cost, PKR 17,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the erection and installation cost. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Cost of electrical works, PKR 29,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the cost of electrical works. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Insurance cost, PKR	Project Feasibility Report	Request for approval dated



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Input Parameter, Value	Source	Validation justification
8,000,000	& request for approval of Project	05/06/2005 included the insurance cost. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Duties & taxes, PKR 23,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included the duties and taxes. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Contingency cost, PKR 22,000,000	Project Feasibility Report & request for approval of Project	Request for approval dated 05/06/2005 included contingency cost. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Interest on loan, 10%	Project Feasibility Report	Based on interest rate of State Bank of Pakistan and KIBOR value prevailing in 2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).
Depreciation cost, 10%	Project Feasibility Report	Based on company's policy for determination of depreciation on assets. Request for approval dated



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Input Parameter, Value	Source	Validation justification
		05/06/2005 included the depreciation cost. Approval of project by management committee dated 07/07/2005. It reflects value applicable at the time of decision making and is in line with paragraph 6 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58).

Validation of Input Values of Investment Analysis

The project participants also provided invoices and information from equipment suppliers that the DOE used to further substantiate that the cost of equipment was reasonable. This included the Turbomach price schedule (dated 18/02/2005) which was included in Appendix 2 of the PDD (Att B – Gul Ahmed IRR assumption) and sources covering other equipment costs.

Validation justification of other input values and other parameters are as follows:

S.No.	Parameter	Figures used in IRR Calculation	Validation Opinion
1.	Salaries	As per costing worksheet	Verified number of personnel during site visit, shift break-up and salary sheets (books of account). Major staff to be shifted to the new project. Found appropriately computed.
2.	Maintenance	As per costing worksheet	Verified maintenance contract with supplier, cost sheet in consultation with sector specialist. Found appropriately computed.
3.	Turbine Operating Load	95%	As per company's policy which was reviewed for other projects and found compliant.
4.	Gas Engine Operating Load	Between 78 – 100 %	Verified log sheets and operating records in consultation with sector specialist. Found appropriately computed.

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5.	HFO Engine Operating Load	92%	Verified log sheets and operating records in consultation with sector specialist. Found appropriately computed.
6.	Cost of Project	Rs. 500 Million	Cost of equipment (turbine) was in US \$ however rest of the elements of project cost were calculated in local currency. To establish a uniform approach, all costs were converted in local currency on the basis of prevailing US \$ to Rupee conversion. Verified forex rates issued by State Bank of Pakistan. Found appropriately computed.
7.	Loan repayment period	5 Years	Verified bank financing terms & conditions prevailing in 2005 by financial consultant. Found appropriate.
8.	Depreciation Period	10 Years	As per company's policy which was reviewed for other projects and found compliant. Also found in line with International Accounting Standard verified by financial consultant. Found appropriate.
9.	Life of project for financial analysis	15 Years	As per company's policy which was reviewed by sector specialist and financial consultant. Found appropriate.
10.	Euro Rupee Conversion Rate	Rs. 77 for 1€	Verified forex rates issued by State Bank of Pakistan. Found appropriate.
11.	Trading Price per ton of Carbon	€10/ Ton	Verified through the project feasibility statement. Found appropriate.
12.	Carbon Emission Reduction	30,000 Tonnes per Year	Verified through the project feasibility statement. This value was considered by Gul Ahmed during decision making and calculation of



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			IRR with carbon credits for the proposed project. Found appropriate and conservative to the actual CER reduction available in PDD.
13.	Risk free rate based on Government Bond Rates	11%	Verified through State Bank of Pakistan. Government Bond Rates data available on State Bank of Pakistan website. The risk free rate is taken from publicly available State Bank of Pakistan data, which is the Central Bank and therefore reliable. It was applicable at the time of decision making and was therefore validated. Found appropriate. The detailed justification is provided above.
14.	Equity/ Country Premium based on 15 year period market data	18.6%	The market return is derived from publicly available data of average returns of the Karachi Stock Exchange for the 15-year period 1990-2005 (Karachi Stock Exchange data is available on Bloomberg Finance (Bloomberg Finance L.P.)). Since the market return is calculated based on publicly available Karachi Stock Exchange data, and represents an average market return for 15 years (a long and representative period). This value accurately represents the risk premium in the host country and is applicable at the time of decision making, and hence was accepted. Market data established from State Bank Annual Reports, Bloom Berg. Verified by the financial consultant. Found appropriately computed. The



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			detailed justification is provided above.
15.	Beta	0.92	Beta calculated from Power Sector Pakistan available in Bloom Berg. Verified by financial consultant. Found appropriately computed. The detailed justification is provided above.
16.	Equity Return	28%	Calculated through the use of formula including Beta, Equity/ country premium and risk free rate. Verified by financial consultant. Found appropriately computed. The detailed justification is provided above.
17.	Proportion of Debt	74%	Verified through Gul Ahmed Textile Mill's annual reports available on company's website. Verified by financial consultant. Found appropriately computed. The detailed justification is provided above.
18.	Proportion of Equity	26%	Verified through Gul Ahmed Textile Mill's annual reports available on company's website. Verified by financial consultant. Found appropriately computed. The detailed justification is provided above.
19.	Cost of Debt	11.25%	Verified through Gul Ahmed Textile Mill's loan terms available in annual reports available on company's website. Verified by financial consultant. Found appropriately computed. The detailed justification is provided above.
20.	Effective Tax Rate	0%	Verified by financial consultant as project's IRR is pre-tax. Found appropriate.
21.	Weighted average cost	15.6%	Calculated through the use



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	of capital (WACC)		of formula including equity return, proportion of debt, proportion of equity, cost of debt, effective tax rate. Verified by financial consultant. Found appropriately computed. The detailed justification is provided above.
22.	IRR of Project with Carbon Credit	17.1%	Based on Gul Ahmed's IRR calculations, verified by financial consultant. Found appropriately computed.
23.	IRR of Project without Carbon Credit	14%	Based on Gul Ahmed's IRR calculations, verified by financial consultant. Found appropriately computed.

It is hereby confirmed that the underlying assumptions are appropriate and the financial calculations are correct.

Therefore VVM, paragraph 112 (a) has been satisfied.

Sensitivity was also performed in the investment analysis. The results of this analysis are presented in Section B.5 of the PDD submitted for registration. The calculations for the sensitivity can be found in the confidential Excel spreadsheet 'Att A - Gul Ahmed IRR calculation NOT FOR PUBLICATION', which was submitted separately for Project registration. As illustrated in the Excel spreadsheet and in line with paragraph 17 of the "Guidelines on the Assessment of Investment Analysis" (EB 51, Annex 58), the project participants included two variables in the sensitivity analysis. Annual savings as a result of the project was increased by 10% and the total investment cost was decreased by 10%. These variables cover all costs and revenues (in the form of cost savings) of the project activity and that a variation of these parameters of more than 10% is unlikely. This demonstrates that even with a significant variation of the key variables, the project IRR remains less than the benchmark of 15.6%. This demonstrates the robustness of the financial analysis, and further supports the conclusion that the project is additional.

The benchmark application was found suitable as the project would only be feasible and attractive to Gul Ahmed Textile Mills on the basis of CDM approval. As external benchmarking is based on reliable data available on publicly accessible websites and represents reliable information therefore DOE confirms the suitability of benchmark. Please refer to item 3.6 above. Therefore VVM, paragraph 112 (b) has been satisfied.



The DOE after reviewing the financial data, sources, formulae and justifications and based on the assessment result by the financial expert engaged, hereby confirms that the underlying assumptions are appropriate and the financial calculations are correct. Therefore VVM, paragraph 112 (c) has been satisfied.

3.6.4 Barrier analysis (116)

The steps taken to assess the relevant information contained in the PDD against each barrier are described below.

Barrier (a): The barrier due to prevailing practise was validated through the data which was collected by GTML from OEM representatives about the sale of CCGT equipment. This data was available in original form and depicted that the organizations, textile sector in particular is not eager to invest in this technology due to complexity, high investment, maintenance and operational issues. This was further substantiated through the review by Sector Expert Mr. Khalid Aijaz currently employed by Mott McDonald Pakistan, confirming the validity of data and barrier.

As per Attachment A to Appendix B of the “Simplified modalities and procedures for small-scale CDM project activities”, it needs to be shown in barrier due to prevailing practice that prevailing practice or existing regulatory/policy requirements would have led to implementation of a technology with higher emissions.

There are 400-500 textile mills in the host country (http://www.aptma.org.pk/Pak_Textile_Statistics/Gctipw.asp). The All Pakistan Textile Mills Association (“APTMA”) is the largest association of textile spinning, weaving, and composite mills in Pakistan. The prevailing practice in these mills is to use gas engines (a few use diesel/heavy fuel oil engines) for electricity generation. A survey was conducted by APTMA, the results of which confirm that none of their members (except the project proponent) have (as on 27/07/2009) installed a combined cycle power generating plant (APTMA letter, Ref no: PO/Chair/13/00767 dated 27th July 2009, Figure 18, p. 65 PDD Version 14). Thus it is confirmed that the proposed CDM project activity of Gul Ahmed Textile Mills Ltd. (project participant) is the first and only such installation among the of the APTMA members (as on 27th July 2009). It is therefore reasonable to conclude that even at the time of decision making, the project participant’s proposed CDM project activity was the first installation of a combined cycle power generating plant amongst APTMA members.

The above facts are further corroborated via data from two of Pakistan’s leading gas engine distributors, who sold more than 1,200 engines (more than 1,400 MW of total gas engine capacity) to textile mills in Pakistan between 2001 and 2006. Data from leading distributors of gas turbines (representing more than 80% of the market), indicates that approximately 15 gas turbines (ca. 75 MW of total gas turbine capacity), were commissioned between 2001 and 2006 in textiles mills in Pakistan (and this includes the Project’s 10 MW turbine).



	Quantity sold 2001 – 2006	Capacity sold [MW] 2001 - 2006
Gas engines	> 1,200	> 1,400
Gas turbines	< 15	< 75

Number and capacity of gas turbines and gas engines sold in Pakistan in the textile sector between 2001 and 2006

Sources of information:

- Gas engines: Data from two leading manufacturers yielding a minimum figure for total sales in Pakistan.
- Gas turbines: Data from distributors representing more than 80% of market share. Their sales figures were multiplied by a conservative (i.e. high) factor of 1.5 to estimate an upper value of total sales in Pakistan

The above table was compiled based on data received from Orient Power (e-mail of Mr. Anwar ul Hasan, dated 13/08/2007, distributors for Jenbacher Gas Engines), Allied Engineering Services Ltd. (e-mail of Mr. Ghazanfar Abbas, dated 16/08/2007, distributors for Caterpillar), and Turbomach Gas Turbines. The data was validated by the DOE during the site visit.

Above table indicates that 15 gas turbines were sold to the textile sector. Gas turbines are one component of the combined cycle project which also requires a waste heat recovery boiler and steam turbine (figure 1 of PDD). Stand alone gas turbines can also be used for electricity generation.

The above explanation clearly establishes that combined cycle gas turbine (“CCGT”) based power generation is not a prevailing practice in the textile industry in Pakistan.

Barrier (b): The other barrier is that the project is not financially attractive to be undertaken without additional revenues from CDM. This was substantiated by GTML during the project feasibility stage. GTML performed benchmarking of IRR which revealed that project without CDM is not feasible. The validation of data and values used for feasibility study, equity return, weighted average cost of capital (WACC) and assumptions indicated in the IRR computation was performed by Finance Specialist and were found to be authentic.

The DOE hereby confirms that the barrier analysis performed is credible.

3.6.5 Common practice analysis (119)

The common practise was established on the basis of data collected by GTML from OEM representatives about the sale of CCGT equipment. This data included reference of companies who have purchased similar equipment. This was further filtered to textile sector which shows that the common practice in the textile sector in Pakistan is to simply use gas engines, open cycle gas turbine. The main reason is huge investment, complexity, high maintenance and operational issues which was clearly evident through



the feasibility study of project and availability of combined cycle gas turbines in industry. On the other hand gas/ diesel engines are easy to operate, flexible and low investment as technology is widely available with local expertise in operations and maintenance. This was further substantiated by sector expert confirming the preference towards gas/ diesel engines for electricity generation in Pakistan rather than CCGT projects.

The DOE reviewed the common practise analysis with sector expert who identified that combined cycle gas turbines were only installed by public sector organizations such as Karachi Electric Supply Corporation, WAPDA where the projects are government funded. Also by reviewing the sales performance of local partners representing OEMs of diesel/ gas generators, it was clearly evident that diesel/ gas generators are widely in use by industry either on sale or rental arrangements. The DOE confirms that the proposed CDM project activity is not common practice.

3.7 Monitoring plan (122)

The DOE hereby confirms that the monitoring plan complies with the requirements of the methodology.

The monitoring and metering arrangements for the consumption of natural gas, diesel and heavy fuel oil as well as output consisting of electricity and steam were reviewed during the site visit. All monitoring and measurement points were found to be effective and equipment such as gas/ liquid flow meters, electric meters used for monitoring and measurements were found to be in appropriate condition. Records of monitoring, log sheets, calibration reports were also reviewed during the site visit in conjunction with the monitoring plan.

The steps taken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design are described below.

The Project uses the approved monitoring methodology AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”. This methodology stipulates that monitoring shall consist of metering the energy use of the equipment installed and calculating the energy savings due to equipment installed. According to the B 7 of the PDD (Application of a monitoring methodology and description of the monitoring plan), these requirements are fulfilled.

Leakages occurring due to transfer of energy efficient equipment from another activity or existing equipment transferred to another activity are defined in Section B.6.1 of PDD version 14, dated 24/10/2010. Leakage has not been considered according to the following justification which was reviewed and found to be adequately addressed.

As the project does not use any transferred equipment and only new equipment is used and also according to the decision taken in forty fourth meeting of Executive Board held on November 28, 2008, the Board decided that because of uncertainty and difficult quantification of emission impact of continued use of displaced equipment outside the project boundary, therefore leakage from equipment transfer from within to outside the project boundary may be excluded from consideration.



The DOE hereby confirms that the project participants are able to implement the monitoring plan.

3.8 Sustainable development (125)

The host Party's DNA confirmed the contribution of the project to the sustainable development of the host Party. Refer to item 3.1 of this report.

3.9 Local stakeholder consultation (128)

The steps taken to assess the adequacy of the local stakeholder consultation are described below.

GTML had sent letters to local stakeholders namely, Environmental Protection Agency, Sindh, Chairman (Landhi Association of Trade & Industry), Nazim (Town Municipal Administration, Landhi), President (Gul Ahmed Employees Union), Joint Secretary (Focal Point DNA, CDM, Islamabad) to apprise the stakeholders about the project.

The list of stakeholders, consultation letters and response received from the stakeholders has been included in Section E 2 and Annex 5 of PDD.

The stakeholders viewed Gul Ahmed Combined Cycle Gas Turbine Project at Gul Ahmed Textile Mills Unit No. 1, Landhi, Karachi as contributing to local environmental benefits and socio-economy. Overall, there was an agreement that the project activity is beneficial for the local sustainable development.

Due to the nature of the project, the project participants are required to perform only Initial Environmental Examination (IEE). IEE does not require public participation (The Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000). According to the IEE requirements and keeping in view the project activity, GTML's identification of local stakeholders and the mechanism of communication were found to be appropriate.

The DOE hereby confirms that the process of local stakeholder consultation is observed to be adequate.

3.10 Environmental impacts (131)

The project participants have undertaken Initial Environmental Examination (IEE) as environmental impact assessment was not required by EPA, Sindh due to the nature and scale of project.

All aspects like water, air, land, and noise pollution as well as effect on ecology have been considered. As the project is within the boundaries of GTML and does not display any severe environmental impact therefore the positive impacts have been identified in Section D 1 of the PDD.



No environmental permits are required from authorities. GTML has taken care to minimize risks and hazards by installing state of the art equipment and adopting good engineering practices.

4 VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the “Gul Ahmed Combined Cycle Gas Turbine Project” in Pakistan. The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

Project participant/s used the latest tool for demonstration of the additionality "Attachment A to Appendix B of the simplified modalities and procedures for small-scale projects". In line with this tool, the PDD provides analysis of investment barriers and barriers due to prevailing practice to determine that the project activity itself is not the baseline scenario.

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

The review of the project design documentation (version 14) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

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

5 REFERENCES

Category 1 Documents:

Documents provided by Type the name of the company that relate directly to the GHG components of the project.

- /1/ Evidence of CDM consideration – Request for Approval dated June 2005 and subsequent approval by management committee dated July 7, 2005
- /2/ Project design document Version 14 dated 24/10/2010
- /3/ Financial analysis of Project



- /4/ Internal benchmark IRR used by GTML
- /5/ External benchmark IRR used by GTML
- /6/ CER Calculations
- /7/ Approval from DNA, Ministry of Environment, Government of Pakistan dated, December 29, 2008.
- /8/ Approval from DNA, Department for Environment, Food and Rural Affairs, United Kingdom, dated, January 27, 2009.

Category 2 Documents:

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

- /1/ Communication regarding local stake holder meeting dated August 07, 2007
- /2/ AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”
- /3/ Tool for the demonstration and assessment of additionality, version 03, EB 29
- /4/ Kyoto Protocol to the United Nations Framework Convention on Climate Change, United Nations 1997
- /5/ Lifetime of the equipment, letter from MASCO Energy Services
- /6/ Maintenance and overhaul schedule of Wartsila Engines
- /7/ Service Report Engine 2 by Wartsila Pakistan Limited
- /8/ Yearly Inspection Reports of Boilers

Persons interviewed:

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

- /1/ Mr. Bashir Ali Mohammad – Chairman - GTML
- /2/ Mr. Riazat Hussain – Director Projects – GTML
- /3/ Mr. Salahuddin K.F. Rehman – Technical Director – GTML
- /4/ Mr. Abdul Aziz Yousuf – Director - GTML
- /5/ Mr. Muhammad Iqbal Sheikh – Utility Manager – GTML
- /6/ Mr. Arnaud Viel – CDM Project Manager – EcoSecurities
- /7/ Mr. Muhammad Taufique – Organization Analyst – EcoSecurities



6. CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

NAME : IMRAN ALTAF BHATTI
NATIONALITY : PAKISTANI
DATE OF BIRTH : February 12, 1974.
POSITION : CERTIFICATION MANAGER/
LEAD AUDITOR/ LEAD TRAINER/
CDM VERIFIER

EDUCATION

- Masters in Business Administration (MBA) from Institute of Business Administration, Karachi.
- Post Graduate Diploma in Business Administration from Institute of Business Administration, Karachi.
- B.E. (Mechanical Engineering) from N.E.D. University of Engineering and Technology, Karachi.

PROFESSIONAL MEMBERSHIP

- Pakistan Engineering Council (PEC) Registration Number: MECH/ 13640

PROFESSIONAL QUALIFICATIONS & CERTIFICATES

- QMS AUDITOR/ LEAD AUDITOR COURSE
5 Day Auditor / Lead Assessor Training Course for Quality Management Systems, AOQC Moody International, Karachi, Certificate No. 5947, Year 1999.
Transition Course to ISO 9001:2000, AOQC Moody International, Karachi, Year 2001.
- EMS AUDITOR/ LEAD AUDITOR COURSE
5 Day ISO 14001 – Auditing Principles and Environmental Management Systems Auditor Training Course (IRCA – 2017), Bureau Veritas Quality International, Karachi, Certificate Number EA/03/PK/014/DBA, Year 2003.
One Day Course on National Environmental Quality Standards, conducted by Quality Consulting Services, Karachi, Certificate No. QCS/NEQS/009'02, Year 2002.
ISO 14001: 2004 – Environmental Management Systems Auditor/ Lead Auditor Transition Course, Year 2004.



- OH&SMS AUDITOR/ LEAD AUDITOR COURSE
3 Day Occupational Health and Safety Management Systems Auditor Conversion Training Course, Bureau Veritas Quality International, Karachi, Certificate Number HS/03/PK/011/DBA, Year 2003.

OHSAS 18001: 2007 – Occupational Health & Safety Management Systems Auditor/ Lead Auditor Transition Course by Bureau Veritas Certification held in Istanbul, Turkey in Year 2007.
- SA AUDITOR/ LEAD AUDITOR COURSE
Three Day SA 8000 Advanced Course by Social Accountability International (SAI) in Year 2007.
Four Day Social Accountability International (SAI) Registered Auditor/ Lead Auditor Course, Bureau Veritas Quality International, Year 2005.
Three Day Comprehensive course by Quality Consulting Services on developing auditing skills for SA 8000 Social Accountability. Certificate Number QCS/SA/015'02, Year 2002.
- CDM VALIDATOR & VERIFIER COURSE
Five Day Clean Development Mechanism (CDM) Validator & Verifier Course based on United Nations and UNFCCC requirements of Global Warming, by Bureau Veritas Certification, Mumbai, India.
- QMS LEAD TRAINER
Authenticated Trainer for Bureau Veritas Certification on Quality Management Systems.
- EMS LEAD TRAINER
Authenticated Trainer for Bureau Veritas Certification on Environment Management Systems.
- OH&S LEAD TRAINER
Authenticated Trainer for Bureau Veritas Certification on Occupational Health & Safety Management Systems.
- SA 8000 (SOCIAL ACCOUNTABILITY MANAGEMENT SYSTEM) TRAINER
Authenticated Trainer for Bureau Veritas Certification on Social Accountability Management Systems.

CAREER EXPERIENCE:

Company: Bureau Veritas PAKISTAN
Duration: May 15, 2002 to Present
Position: Certification Manager
Lead Auditor (ISO 9001)
Lead Auditor (OHSAS 18001)
Lead Auditor (ISO 14001)



Lead Auditor (SA 8000)
 Social Compliance Auditor
 Lead Trainer (Quality Management System)
 Lead Trainer (Environment Management System)
 Lead Trainer (Occupational Health and Safety Management System)
 Trainer (Social Accountability Management System)
 CDM/ JI Verifier

Experience:

Audited more than 500 different companies in various Industrial Sectors e.g. Oil & Gas Engineering, Construction, Automotive, Chemical, Sugar, Leather, Surgical Instruments, Sport Goods, Textiles, Software, Petrochemicals, Pharmaceuticals, food and Service etc. on Quality, Environment, Occupational Health & Safety Management Systems within Pakistan and Middle East.

Conducted SA 8000 Audits as Lead Auditor covering issues such as Child Labor, Forced Labor, Discrimination, Working Hours, Compensation, Health and Safety, Freedom of Association, Disciplinary Practices and management system elements in Textile, Leather and Sports Industry in Pakistan. Conducted Second Party Social Compliance Audits for Various Foreign Buyers such as Shopko, K-Mart, Tesco, Revman, Maurice Phillips, ASDA, Arcadia, Abricombie & Fitch, Coloroll (CW Textile), Contempo, Decathlon, Disney, McDonalds in Pakistan and Bangladesh covering the issues mentioned above.

Conducted a study in 2005 on the operations of Nestle Waters Pakistan, an assignment performed on behalf of Bureau Veritas Consulting – UK. The project was assigned to Bureau Veritas by Nestle – Switzerland.

Conducted Second Party Audit on behalf of Corn Products International, U.S.A. for their two units in Pakistan namely Rafhan Maize Products in Faisalabad and Jaranwala. The audit covered issues related to Quality, Environment, Health & Safety, and Plant Security.

Conducted Second Party Audits on behalf of Nestle – Switzerland against CARE (Compliance Assessment against Human Resources and Health, Safety and Environment), a CSR Tool applicable on all Nestle Sites worldwide. Audited four production facilities of Nestle Pakistan according to requirements of CARE.



Performed AA 1000 Stakeholder Management Audits of British American Tobacco Company (Pakistan Tobacco Company), a global CSR project of BATCO.

Conducted Second party HSE Audits on behalf of Qatar Petroleum for Qatar Vinyl Company (QVC), Qatar Fuel Additives Company (QAFAC), Qatar Petrochemical Company (QAPCO).

Conducted ISO 9001: 2000 Assessor/ Lead Assessor Courses within Pakistan as well as in Middle East as Lead Tutor.

Conducted OHSAS 18001: 1999 Assessor/ Lead Assessor Courses within Pakistan as well as in Middle East as Lead Tutor.

Conducted ISO 14001: 2004 Assessor/ Lead Assessor Courses within Pakistan as well as in Middle East as Lead Tutor.

Conducted SA 8000: 2001 Auditor/ Lead Auditor Courses as Trainer/ Tutor.

Conducted various in-house training courses on Awareness, Implementation, Documentation and Internal Auditing for Social Accountability, Quality, Environment and Health & Safety Management Systems.

Conducted in-house Social Accountability SA 8000 Awareness and Implementation Courses.

PREVIOUS EMPLOYMENT

Company:	Ghandhara Nissan Diesel Limited.
Duration:	October 1996 to January 1998.
Company Activity:	Assemblers of Trucks and Buses.
Position:	Executive Engineer
Responsibilities:	Responsible for the Management/ Maintenance of Metal, Paint and Assembly Sections. Providing/ Implementation of technical assistance to Quality related activities.
Company:	Artal Foods Ltd. (Pak Water Bottlers (Pvt.) Ltd.
Duration:	January 1998 to June 1999.
Company Activity:	Food Conglomerate dealing in Brands such as KFC, Harry's Bread, Value Chicken, AVA Water.
Position:	Asst. Manager (Quality Assurance Department / MR)
Responsibilities:	Responsible for providing technical assistance for certification of ISO 9000 Standard. Development, Maintenance and implementation of Quality Assurance activities.



Company:	Quality Consulting Services (QCS)
Duration:	June 1999 to April 2002
Company Activity:	Consultancy & Training in Quality, Environmental, Social, Occupational Health & Safety Standards.
Position:	Director
Responsibilities:	Responsible for marketing, Planning, training and Consultancy of Quality Management System to ISO 9000, ISO 14000, OHSAS 18000 and SA 8000 Standards (Automotive, Pharmaceutical, Shipping, Textile Spinning, Garments and Service Sector). <ul style="list-style-type: none">• Conducted Gap Analysis audits of Various Industries.• Conducted Training courses on Introduction to Quality Management System, Internal Auditing, Machine Maintenance System and Statistical Process control at Client's Premises.• Conducted a two-month course in NED University of Engineering and Technology, Karachi on Integrated Management System covering ISO 9000 and ISO 14000 management systems.
Company:	Abu Dhabi Water & Electricity Authority, Abu Dhabi, U.A.E.
Duration:	May 2001 to August 2001
Position:	Consultant/Auditor
Responsibilities:	Provided consultancy and prepared Gap analysis on behalf of Bureau Veritas, Abu Dhabi on Integrated Management Systems covering ISO 9001, ISO 14001 and OHSAS 18001.
Company:	Bureau Veritas, Saudi Arabia.
Duration:	January 2001 to March 2001
Position:	Consultant/Auditor
Responsibilities:	Associated with Bureau Veritas, Saudi Arabia. Provided consultancy and performed audits in different sectors. Provided consultancy to National Biscuits and Confectionary Co. Limited, Jeddah, Babader Trading & Industrial Corporation, Jeddah and Arabian Contractor Company, Jeddah.



 VALIDATION REPORT

- | | |
|--------------------------|---------------------------------|
| 1. Name | Abul KALAM Siddiqui |
| 2. Date of birth | 1 st July, 1950 |
| 3. Nationality | Pakistani. |
| 4. Bureau Veritas Office | Pakistan. |
| 5. Job Title | Chief Executive of BV Pakistan. |
| 6. Spoken Languages | English, Urdu. |
| 7. Marital Status: | Married, Two children |

8. Technical, Academic & Professional Qualification

Year	Others
2009	Bachelor of Engineering Marine. Masters in Industrial Management Contd.
2009	Diploma in Lifting Gear General from LEEA Lifting Equipment Engineers Association.
1984	Certificate of Competency as First Class Engineer (Motor) issued by Mercantile Marine Department, Government of Pakistan.
1972-1973	Ship-owner Marine College, Karachi, Pakistan. Attended Weekly Theoretical courses in Marine Engineering, Applied Mechanics, Thermodynamics, Metallurgy, Engineering Drawing, Electro Technology, Naval Architecture, Mathematics & Diesel Engines.
1968-1972	Karachi Polytechnic Institute, Pakistan. Attended Weekly Theoretical courses in Marine Engineering, Applied Mechanics, Thermodynamics, Metallurgy, Engineering Drawing, Electro Technology, Naval Architecture, Mathematics & Diesel Engines.
1968-1972	4 years Marine Engineer Apprenticeship training in Workshop & on board Ship from British India Engineering Works, Karachi, Pakistan. (Pioneers in Shipping Industry in Pakistan)

9. Training

Training Courses Related

Year	Quality
1998	Lead Assessor Training Course for ISO 9000 Quality Management System from BVQI. (Certificate Sr. No. LA/98/DB/568) Course No. A 8756 Held on 18 – 22 Oct. 1998.) Updated to ISO 9001/2000 version on October 2001, Course Certification No. A 17024.



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- 1998 Internal Auditor Training Course for ISO 9000 Quality Management from BVQI. (Certificate Sr. IA/98/DB/079) Course No. R 415 Held on 21 – 23 February 1998)
- 2002 SA 8000 Auditor Training Course Certificate No. BVQI/PAK/SR/01 – 02
- 2003 Lead Assessor Training Course for Environmental Management System ISO 14001(IRCA – 2017) between 3rd – 7th February 2003. Certificate Serial No. EA/03/PK/015/DBA. Course No. A14478.
- 2003 Lead Assessor Training Course for Occupational Health & Safety Management System OHSAS 18001, (IRCA – OH&SMS) between 9th – 11th July 2003. Certificate Serial No. HS/03/PK/030/DBA. Course No. A16205.
- 2006 5 days post graduate course on Operation & Maintenance of an Industrial Plant (Power/Process/Mechanical Manufacturing etc. from September 4 to 8, 2006.conducted by NED University.
- 2007 Clean Development Mechanism (CDM) Verifier/Lead Verifier 5 days training course conducted between April 09 to 13, 2007, by Bureau Veritas India at Mumbai.
- Others:
- 1998 3 months training in Bureau Veritas, office in Dubai, for Marine activities, Industrial, pre-shipment inspections and also office management..
- 1999 DNS surveyor training in Dubai, UAE between 12th & 16th November 1999.
- 1999 ISM Lead Auditor Training Course of Safety Management System for the Marine Division (Certificate No. DNS/148/L Valid until 10/08/2007).
- 2006 ISPS Auditor Training Course of International Ship & Port Facilities Security Held at Dubai between 30th March – 3rd April 2006.
- 2008 Marine Surveyor training for updated requirements.

10. Professional Experience

Significant Career Experience



November 1997 till now: Working with Bureau Veritas as Surveyor for Marine, Industrial & Pre-Shipment inspections, Auditor for ISO 9001/2000, Manager of BV Jeddah, Saudi Arabia, transferred as C.E for BV Pakistan.

March 1994 till Dec. 1997: Worked with Messrs. Burislee Shipping Services, Independent Surveyors, Kuwait, as Marine, Cargo & Industrial Surveyor.

Jan. 1973 till Mar.1994: Worked for Pakistan National Shipping Corporation. Sailed on number of Cargo Ships, Container Vessels and oil tanker.

As Marine surveyor carried out number of classification and statutory surveys on board ship whilst afloat and during dry-docking. Recommended and monitored UT gauging repairs & renewal of steel structures and frames.

Some of the Third party major industrial inspections carried out recently are as under:

- Review of material certificate, monitoring of fabrication as per ASME requirements review
- of weld X-rays, measurements & pressure test of number of pressure vessels in Messrs. Belleli, Jubail, Saudi Arabia, on behalf of Kuwait Oil Company.
- Confirmation of manufacturing of various sizes of Gate Valve in accordance of BV 5163 on behalf of AVK Saudi Valve manufacturing Co. LTD., Jeddah, Saudi Arabia. Reviewed valve material, Procurement procedure, review of documents, witness of process control, witnessing of random testing, reviewed random traceability.
- Inspection & transfer of heat numbers on Hot Rolled Steel Plates at ATTIEH Steel, Saudi Arabia on behalf of Messrs. Specialist Oil Field, Kuwait.
- Tensile & Yield test of various sizes of nuts & bolts during manufacturing at Messrs. Al Rashed Fasteners, Al Khobar, Saudi Arabia on behalf of BV. Abu Dhabi.
- Inspection and pressure test of Gate Valves of various sizes as per Saudi ARAMCO scope of inspection at AVK valve manufacturing Co. on behalf of BV. Denmark.
- Inspection of Sabroe Refrigeration Equipment for Al Jouf Agricultural Development Co. Project at Sekaka project site, Saudi Arabia.
- Inspection services carried out as an Expediter at Hidada Steel Co., for PARSONS USA for the fabrication of steel structure Beams, Columns, Girders etc. of about 2000 Tons for Petro-kemya Project in Jubail, Saudi Arabia.
- Inspection services carried out as an Expediter at Hidada Steel Co., for PARSONS USA for the fabrication of panels grating.

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- Expediting Services at Saudi Cables Co. for PARSONS USA in producing medium tension cables of about 23 Kilo Meters for Petro-kemya project in Jubail, Saudi Arabia.
- Inspection services for TENCO-SAIPEM for the fabrication of Pipe Support saddles of various sizes for Muglad Oil Development Project in Sudan at PDM Co., Yanbu, Saudi Arabia.
- Inspection services for TENCO-SAIPEM for the fabrication of about 300 small size pressure vessel's (Glycerine Containers) and their Hydro test for Muglad Oil Development Project Sudan, at PDM Co. Saudi Arabia.
- Inspection services for TENCO-SAIPEM for verification for specifications for various items for Muglad Oil Development Project Sudan such as Electrical items, Air-conditioning items and various sizes of pipes.
- Inspection services as Saudi ARAMCO for the fabrication of Low Voltage Electric Motor starters in JEDAC affiliated with General Electric.
- Inspection services on behalf of Snamprogetti at Al Zamil Heavy Industries Jeddah, for large size pressure vessel's for the extension work of Shoaiba Desalination plant.
- Load test and certification of heavy and light mobile, floating & overhead cranes.
- Annual boiler inspections for industries and Hotels.
- Inspection, testing and certification of load test of lifting tackles and wire slings.
- Damage repair of stainless steel chemical tank containers as per approved standards.
- NDT test of overhead crane structure for Messrs. Morris Cranes.
- Testing & certification of Safety valves of heavy duty portable Air Compressors.
- On behalf of M/S Snamprogetti, Italy follow up of fabrication of about 6000 tons of steel structure as per the inspection test plan of Hyundai Engineering & construction company for NGL4 project at Qatar.
- On behalf of M/S Saudi Archirodon inspection during fabrication of large quantity of Varifoam sandwiched corrugated panels and VP single panels with corrugations.

11. Experience

Certification Audit Experience



Year	Quality
1998 till date:	Participated as an auditor in ISO9001/2 certification audits of various companies e.g computer soft-wares, Catering services, air-conditioning, Vehicle trading companies. Radio Inspection companies. Companies providing services of Safety Equipment such as servicing of Fixed & portable fire extinguishers of Dry powder, Foam & CO2. Hydro-testing of cylinders. Life Raft service stations, Textile & Garment Industries etc.
2000 till date:	Participated independently and also as team member in ISM audits of companies in Saudi Arabia, Abu Dhabi & Fujairah, UAE. Independent audits initial and intermediate onboard vessel were also carried.
12. PSI Experience	
1995- 01	Wide experience of pre-shipment inspection for M/S Cotecna Kuwait for Pakistan. For BV CDG an average of 200 containers/ month have been inspected for SABIC & Mobil stuffed with various petrochemicals. Large quantity of containers were inspected with food items and other general items exported to Kenya, Ivory Coast, Bangladesh, etc. Also bulk quantities of cement and bulk of oil for Mobil Africa.
13. CAC Experience	
2001 till todate:	Good experience in Change of class after construction of vessels. Succeeded in CAC of 20 port crafts, at Jeddah, Saudi Arabia.
14. Managerial Experience	
1998 - 2002	Working as manager for BV office in Jeddah, Saudi Arabia. During the tenure successfully negotiated and confirmed contracts for Change of class of large fleet with Bakri Navigation and some crafts with M/S. ATCO. Submitted tender documents with Saudi ARAMCO. Succeeded in obtaining ISM contracts with local companies. Succeeded in obtaining new building contract of two tugs for Saudi Port Authority leased by Bakri Navigation. New building contract of two 45000 ton chemical tankers of Bakri Navigation under negotiation. Well acquaintance of Bureau Veritas Invoicing and maintenance of accounts and other record. Maintaining integrity of BV among the clients and good relationship with administration, clients and among colleagues.
2002 March	Transferred to Pakistan as C.E.O Bureau Veritas Pakistan.



KHALID AIJAZ

Professional Experience

- Chief Resident Engineer 220 MW combined cycle power project KORANGI Karachi Pakistan
- Chief Resident Engineer DHA COJEN 94 MW Power & Desalination Project Karachi Pakistan.
- Chief Engineer Central Design Office WAPDA, Lahore Pakistan
- Chief Engineer of three high head Hydro power projects of 70MW, 120MW, 130 MW.
- Resident Engineer of MANGLA Dam with 1000 MW Power Station Pakistan.
- Project Director Works PATFEED Canal (70 km) DMJ BALUCHISTAN Pakistan.
- Senior Engineer Civil on Construction of 3x210 MW Thermal Power Station MUZAFERGARH Pakistan.
- Senior Engineer (Civil) on construction of unit (4) 210MW Thermal Power Station GUDU Pakistan.
- Junior Engineer construction, maintenance of 2x210 MW Thermal Power Station GUDDU Pakistan.
- Worked with International Consultants & Contractors HALCROW UK, LAHMEYER Germany, Mott Macdonald Auk, Siemens AG, CMIC China, METKA Greece, and MANDALAY UK.

EXPERIENCE RECORD

2006 – to Date **MM Pakistan (Pvt.) Ltd.**
Chief Resident Engineer
220 MW Combined Cycle Power Project

Responsible for Project Management & supervision services (civil, electrical, and mechanical) of components i.e. four GE gas turbines (50 MW each) steam turbine, heat recovery steam generator (20MW), (HRSG), gas compressors, desalination plant (RO 50 m³/h), 6.6KV (main), auxiliary, service transformers, 220 KV AIS, GIS sub-station cable channels, tunnels & conduits, Intake pump house (open cycle 2x 2335 m³/h, closed cycle 2x7900 m³/h), gas receiving & metering stations & cable & pipe supporting structures of 220 MW (2+2+!+) CCP Project Karachi Pakistan,

Mar 2006 – to Date **MM Pakistan (Pvt.) Ltd.**
Chief Resident Engineer
DHA COJEN Project

Responsible for advisory Project Management Services to DCL, Coordination of EPC Contractors and Production of Project Progress Reports supervision of construction works (civil, electrical & mechanical), Power & Desalination Plant 94 MW consist of Power Train (gas turbine, Steam turbine & HRSG), administration/control building, 132 KV GIS substation building, desalination plant, fine filtration

1971 - to 2006 **Water & Power Development Authority (WAPDA)**
November 2005 – to March 2006 **Chief Engineer Central Design Office WAPDA**



Overall supervision of the design works under execution in WAPDA, and **advisor to WAPDA for all design matters between national & international consultants and contractors.** Developed PC-1 formats of Mega Projects of WAPDA. Advisor to the WAPDA authority on the design of buildings, hydraulic structures, colonies, non-residential buildings, dams, workshops, ware houses, play grounds, chemical storage buildings, water supply & sewerage schemes. Hydro, Thermal power houses which includes industrial buildings & huge stores along with all amenities along with **Roads and small Bridges.**

July 2004 – to August 2005 **Chief Engineer Projects viz. Khan KHAWAR (70 MW), ALLAI KHAWAR High Head Hydropower Projects (HHP) BESHAM, In-charge of three HHP (130MW), DUBER KHAWAR (120 MW).**

Gravity Dam, Embankment Dam, Spillways, Rock fill dams, Diversion Dams, Protection Dams, Intakes, Sand Control Structures Outlet works, Tunneling, diversion tunnel, approach tunnel, Pressure Shafts, Pressure tunnel, surge tanks / chamber, penstock, Power House, protection works, Bunds, **Access roads in hilly areas, Retaining walls, Box Culverts Pipe Culverts, Cause ways, Causeway cum Drop Structure.**

Overall supervision of the above works, to look after contractual matters, coordination of consultants and contractors, review progress bar charts, conduct weekly, monthly progress meetings, approvals of various construction materials processing of variation orders, claim, construction management of the above projects costing Rupees 2 billion, moreover responsible for managing co-ordination between various teams of consultants, contractors (Civil, Electrical, Mechanical & Instrumentation), Remained in-charge of security arrangements. The job includes preparation of plans schedules progress bar charts and display briefings to WAPDA authority on the progress

1998 – 2000 **Resident Engineers (Civil)
WAPDA MANGLA Dam**

Remained in-charge of four Divisions, viz. Colony Division, Spillways Division, Dams Division and Workshop and Stores Division with respect to Technical and Financial matters and to look after all financial and Administrative matters of MANGLA Dam Organization.

Colony Division

Supervision of Technical and Financial matters of Colony Division consists of three colonies (1500 houses along with amenities and infrastructures).

Spillways Division

Look after the Operation and Maintenance of gigantic Spillway consist of 9 lac cusecs capacity, emergency spillway 2.3 lac capacity, intake 5 tunnels 30 ft. diameter including, power house 1000 MW, canal 45000 cusecs capacity, bong escape structure.

Dams Division

Look after the Maintenance of various components of huge embankment Dams with salting earthen core (454 ft height 8.5 miles in length) capacity to store 5.88 MAF water (The biggest earthen Dam when constructed in 1967).

Workshop and Stores Division

Over all supervision of fleet of 40 light vehicles including work, stores and fleet of heavy machinery and equipment, like cranes (from 20 ton capacity to 110 ton capacity), dozers, dumpers, light excavators, fire



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fighting tanker 2000 gallons, tankers of 8000 gallons, tractors, air compressors, boats, ships etc. falls under my administration.

Residency

Being in-charge of residency at MANGLA, the responsibilities were included financial and technical affairs of all Divisions including Hydrology Directorate and Superintending Engineer (Surveillance).

- Coordinate with Hydrology Directorate regarding matters related to water accounts, methods of flood routing of Dams during monsoon.
- Coordinate with Surveillance Directorate regarding affairs of land survey, sediment survey their analysis and in measurement of various types of Instruments installed in the body of Dam, analyzing the recorded data. Keep eye on seepage /boiling through Dam, in coordination of the geology of the Dam is also falls under the preview of residency.
- Look after administrative / social affairs of more than 2000 families living in 3 colonies of MANGLA Dam.
- To deal with local administration of MIRPUR and JEHLUM Pakistan regarding administration problems of employees.
- Look after the affairs of 86600 acres of land acquired by WAPDA during construction of Dam.
- Look after /safeguard WAPDA interests while dealing with Core headquarters MANGLA, and Cantonment Executive Officer, MANGLA Cantonment regarding claims of WAPDA v/s Cantonment.

1996 – 1998

Director Works**Pad Feeder Canal Project WAPDA QUETTA Pakistan**

Posted as Director Works for Pat Feeder Canal QUETTA Pakistan, coordinated with M/s HALCROW UK based Consultants.

Worked on revision PC-I attended meeting with Additional Chief Secretary, PDWP, CDWP, meetings with regard to approval of PC-I besides administrative affairs of the office at QUETTA such as, preparation of progress report, budget estimates, preparation of briefs and others related issues / problems, Claims of Contractor related to the work.

1988 – 1996

Sr. Engineer (Civil)**3x210 MW (Russian thermal units) and 300 MW (Chinese thermal unit)**

Posted as Senior Engineer 3x210 MW and 300 MW (the biggest unit in Pakistan) Thermal Power Station MUZAFERGARH Pakistan. Developed tender documents and specifications for the job.

Worked on construction of more than 600 houses at a time for various categories, with roads, external water supply system, overhead tank 50ft height (50,000 gallons), sewerage system, development of (800 acres), plantation of various play grounds with all activities stated in above etc.



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Also worked on all the activities as stated above for Primary School, Secondary, (double storey building) three storey Administrative Block, rest House, boundary walls, boundary fences (permanent and removable) watch towers, club hall, hospital, mosque, Bed Minton hall, industrial workshops, store halls etc.

Remained in-charge construction supervision and contractual matters on industrial buildings like machine hall, 40 meters high (for 210 MW & 300 MW power Plant) Steel structure, special pre-cast roofing, special roof treatment with self extinguishing thermo pores (for control of heat), fire resisting plaster, special type of rubber, PVC non-slip flooring, chemical resistant flooring, application of polyurethane sheets, commercial flooring, special removable flooring for simulator building, aluminum doors and windows false acoustic ceilings with provision of air conditioning system in the buildings.

Special experience in construction of chimneys, construction of concrete piles, driving of steel piles, dewatering for deep foundations, channels (concrete as well as earthen), cross regulator, intake structures, cooling towers, outfalls structures, earthen bunds in the running canals and on earth. Earth work with standards and modified compactions.

Remain associated with field laboratories for testing of materials, concrete cubes, cylinders, cores concrete slabs and testing of cement, steel reinforcement, and aggregates.

1981 – 1988 **Sr. Engineer (Civil)**
Construction 210 MW (Russian Thermal Units) and Extension for 210 MW (Chinese unit) at TPS Guddu

Worked as Executive Engineer on construction of 210 MW (Russian Unit), Extension for 210 MW (Chinese Unit) at Thermal Power Station GUDU Pakistan carried out activities for Preparation of Project Planning report, site investigation, preparation of estimates, prequalification of contracts, preparation of tender, specifications, calling of tenders, preparation of Adjudication reports, participated pre-bid meetings, opening of tenders, preparation of letter of award to contractors, letter of commencements and execution of Agreements. All these activities are carried out for works ranging from less than a million to more than 800 millions.

The above activities are also carried out for the residential, non-residential buildings, multi storey buildings, Industrial buildings, water supply, sewerage system, roads, chimney (200 M high), tube wells, overhead and underground tanks in GUDU Thermal Power Station Pakistan.

Remain in-charge of various schemes of construction of more than 1000 units with minimum of 100 No. residential units and maximum of 374 residential units at a time in GUDU Thermal Power Station including all activities stated above.

1974 – 1981 **Jr. Engineer**
Maintenance of Residential and Non Residential Buildings at TPS GUDU Pakistan including Powerhouse

Worked on the Maintenance of Residential colonies consist of 1500 houses of various categories having covered area of 606 sq. ft. to 3000 sq. ft. besides non-residential building like Hostel, School, Cinema Hall, Lab our Hall, Mosque, Club, Swimming Pool tennis court. Playgrounds of Cricket, Hockey , Lawn Tennis Courts and Golf Ground. The colon is spread over an area of 250 acres, besides maintenance of all industrial buildings in powerhouse.



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Also remain in-charge of external water supply system to the houses, lawns Water Supply trough deep turbine tube wells on the bank BS feeder. The system consists of overhead tank of 50,000 gallon 50 ft height and underground tank of 2500 cu. Ft. with lifting pumps an motor of 25 to 50 HP.

Also remain in-charge of sewerage system for 1500 houses spread over an area of 250 acres with man holes, septic tanks and four disposal wells with sludge lifting pumps.

Remain in-charge of booking and maintenance of Rest Houses, officer's mess, maintenance of Roads with culverts and drains in the residential area.

1974 – 1981 **Jr. Engineer (Civil)**
 Maintenance Power House 3 x 210 MW

Having experience of Maintenance of Multi storey office building of 2x2/10 GUDU PAKISTAN Thermal Power Station with 35 meter high machine hall, boiler (of steel structure), Chemical plant, workshops, store buildings, open yards, chimney height of 50 meters, switchyard building, fire fighting building, and yard area of oil decanting system and oil decanting tanks.

Maintenance of concrete roads, rain and storm drainage system, fire fighting system remained under my supervision.

1971 – 1974 **Jr. Engineer**
 P & I (Surface Water Hydrology)

Posted as Jr. Engineer at Hyderabad and QUETTA Pakistan in Surface Water Hydrology (WAPDA), responsible to observe and collect data for River Indus, Steams / Rivers of BALUCISTAN, SIND provinces of Pakistan, observing climatic and precipitation data of at various locations.

Education

B.E. (Civil) From Engineering University of Sindh (Jamshoro) Pakistan.

Memembership(s)

Pakistan Engineering Council (PEC) Civil-2134

Training(s)

- 1996 WAPDA Academy Lahore
- 2000 WAPDA Staff College Islamabad
- 2001 WAPDA Academy Faisalabad



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APPENDIX A: COMPANY CDM PROJECT VALIDATION PROTOCOL

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

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK	Table 1, Section A.3.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	OK	Table 1, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section A.3.
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved, including confirmation by the host party that the project activity assists it in achieving sustainable development	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a, §28, Annex 3 of the Resolução Interministerial 01/03	OK	Approval from DNA, Ministry of Environment, Government of Pakistan dated, December 29, 2008. Approval from DNA, Department for Environment, Food and Rural Affairs, United Kingdom, dated, January 27, 2009.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section B.6.
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM	OK	Table 1, Section B.6.4.



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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Modalities §43 and 44		
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords	OK	No public funding for the project from Annex1 parties is indicated in Section A.4.4. and Annex 2.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	OK	Ministry of Environment has been designated national authority by the host country i.e. Pakistan.
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	OK	Host country, Pakistan is a party to the Kyoto Protocol
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	OK	Section E & Annex 5.
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	CAR 2	Environmental impact assessment was not required by EPA, Sindh due to the nature and scale of project. (IEE) Initial Environmental Examination was performed however the report was not available.



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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	OK	Section B.1. and B.2.
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	OK	Section B.7.
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	OK	PDD is available for public comments from 04.04.2008 to 03.05.2008 on UNFCCC website
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45 b, c, e	OK	Section B.4.
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	OK	Section B.4.
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format and fulfilled according to the guidelines for completing CDM-PDD, CDM-NMB, and CDM-NMM	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	OK	Guideline for completing CDM PDD – (CDM-SSC-PDD), Version 03, dated 22 December, 2006



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Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Title of the project activity, version number and date of the document	1,3	DR	Gul Ahmed Combined Cycle Gas Turbine Project PDD Version Number 13 Date: 10/05/2010	OK	OK
A.1.2. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	1,3	DR	The project qualifies as a renewable energy project as the project activity involves the implementation of only a total of 10 MW capacity Gas Turbines The title of approved baseline methodology applied to the project activity is small scale activity AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”.	OK	OK
A.1.3. The small-scale project activity is not a debundled component of a larger project activity?	1	DR	The project activity is not a debundled component of a large scale one as there is no project activity: <ul style="list-style-type: none"> ➤ By the same project participants; ➤ In the same project category and ➤ Technology /measure; and ➤ Registered within the previous 2 years; and ➤ Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point. 	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.1.4. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	2,3	DR	The project activity is small-scale activity generating electricity and steam for internal purposes. AMS-II.D (version 11) – “Energy efficiency and fuel switching measures for industrial facilities”.	OK	OK
A.1.5. Are Party (ies) and private and/or public entities involved in the project activity listed and contact information provided?			Yes. Refer Annex 1 of PDD.	OK	OK
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	1	DR I	The projects spatial / geographical boundaries are not defined in Section B 3 PDD.	CAR 1	OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	1	DR	Yes	OK	OK
A.2.3. Does the project design engineering reflect current good practices.	-		Yes.	OK	OK
18. A 2.4 Will the project result in technology transfer to the host country?	-	DR	No major technology transfer.	OK	OK
19. A 2.5 Does the PDD provide information allowing unique identification of the project activity?			Unique identification of the project activity lat/long is given in A 4.1.4 of the PDD. However the co ordinates are not in decimals	CL 1	OK
20. A 2.6. Does the project require extensive	-	DR	Yes	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?		I			
21. A 2.7 If the view of the project participant on contribution of project activity to sustainable development is included?	1	DR	Yes. View of the PP on contribution of project activity to sustainable development is described in PDD which reflects the nation's policies	OK	OK
22. A 2.8 Is an estimate of the emission reductions for the chosen crediting period furnished in the PDD?	1	DR	Estimate of the emission reductions for the chosen crediting period furnished in the PDD in tabular format. In section A 4.3	OK	OK
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	1	DR I	The social benefit derived from this project other than GHG emission reductions is employment generation and rural development.	OK	OK
A.3.2. Will the project create any adverse environmental or social effects		DR	No adverse environmental or social effects are envisaged.	OK	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	1	DR	Yes.	OK	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	-	DR I	Yes. Approval from DNA, Ministry of Environment, Government of Pakistan dated, December 29, 2008.	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Approval from DNA, Department for Environment, Food and Rural Affairs, United Kingdom, dated, January 27, 2009.		
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	1,2	DR	The project is in line with the baseline methodologies specified in AMS II.D – Energy efficiency and fuel switching measures for industrial facilities. The current version 11 is referred in PDD.	OK	OK
B.1.2. Is the baseline methodology applicable to the project being considered?	1,2	DR	Applicability of chosen methodology is justified in Section B2 of PDD. How the energy efficiency is expected to increase approximately by 37%?	CAR 2	OK
B.1.3. Is the justification to the choice of project category transparent?	1,2	DR	Yes. The project is of 10 MW capacity which is less than the maximum limit allowed under small scale project activities and the aggregate energy savings is less than 180 GWh _{th} per year in fuel input	OK	OK
B.1.4. Does the PDD demonstrate that the project activity is additional as per options provided under attachment A to Appendix	1,2	DR	The additionality of the project is demonstrated in PDD through Investment barrier analysis. Snapshot of IRR calculations provided in PDD.	--	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B of simplified modalities and procedures for small scale CDM project activities?					
B.1.5. Is the date of completion of application of methodology provided in the date format as per dd/mm/yyyy format?			The first draft of PDD with baseline completion was completed on 12.December.2007. Refer B.8. However the date mentioned is not as per the dd/mm/yyyy format.	CAR 3	OK
B.1.6. Is the contact information of the person/entity responsible for application of the baseline and monitoring methodology to the project activity provided in the PDD?			Contact information of the person/entity responsible for application of the baseline and monitoring methodology to the project activity is provided in section B 8 of the PDD.	OK	OK
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	1	DR	Determination of DATE Baseline Retrofit – the average technical lifetime of 2030 is indicated in the PDD. Conservativeness of 2030 is not addressed in the PDD Figure 5 in Annex 3 needs to be validated.	CAR 4	OK
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	1	DR I	Refer above B 2.1.	---	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.3. Is there any indication in the PDD if any of the units covered under this project houses and operates fossil fuel based captive power plants or dependent on any captive power plants for their power requirement.			PDD indicates that fossil fuel based system will be shut down entirely.	---	OK
B.2.4. Are relevant national and/or sectoral policies and circumstances taken into account?	-	DR	Yes, these are summarised in B.5 of PDD.	OK	OK
B.2.5. Is the baseline selection compatible with the available data?	1	DR	Refer B 2.1	-	OK
B.2.6. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	1,2	DR	Refer B 2.1	-	OK
B.2.7. Are the variables, parameters and data sources made available in the PDD in tabular form?	1,2	DR	Section B 6.2 of PDD indicates the variables. Parameters and data sources in tabular format.	OK	OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	1	DR	In section C.1.1 of PDD contract date for the gas turbine 27 July 2005 Expected Operational lifetime is more than 25 years. To be verified	CL 2	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
C.1.2. Is the crediting period clearly defined (seven years with two possible renewals or 10 years with no renewal)?	1	DR	Renewable crediting period is chosen. The start date of crediting period is mentioned as 01 March 2008 Not in ddmmyyyy format. However the start date of the crediting period is already crossed.	CL 3	OK
D. Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	1,2	DR	Yes,	OK	OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	1,2	DR	Yes. The monitoring methodology is applicable to the project being considered	OK	OK
D.1.3. Is the application of the monitoring methodology transparent?	1,2	DR	It is not clear how the energy savings of 150 GWh _{th} is arrived at	CL 4	OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	1	DR	This methodology is reliable as long as the energy meter provided is in un-interrupted operation.	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Are the choices of project emission indicators reasonable?	1	DR	Yes	OK	OK
D.2.2. Will it be possible to monitor / measure the specified project emission indicators?	1	DR	Refer D 2.1 above	OK	OK
D.2.3. Do the measuring technique and frequency comply with good monitoring practices?	1	DR	Refer D 2.1 above	OK	OK
D.2.4. Are the provisions made for archiving project emission data sufficient to enable later verification?	1	DR	Refer D 2.1 above	OK	OK
D.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. If applicable, are the choices of leakage indicators reasonable?	1	DR	Yes, in section B.6.1 of PDD, conditions for leakage are addressed.	OK	OK
D.3.2. If applicable, will it be possible to monitor / measure the specified leakage indicators?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK
D.3.3. If applicable, do the measuring technique and frequency comply with good	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
monitoring practices?					
D.3.4. If applicable, are the provisions made for archiving leakage data sufficient to enable later verification?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1	DR	Yes, the baseline indicators have been chosen in Line with AMS-I I.D, Version 11	OK	OK
D.4.2. Will it be possible to monitor / measure the specified baseline emission indicators?	1	DR	Yes. Possible.	OK	OK
D.4.3. Do the measuring technique and frequency comply with good monitoring practices?	1	DR I	Yes	OK	OK
D.4.4. Are the provisions made for archiving baseline emission data sufficient to enable later verification?	1	DR	Provision for archiving of data is addressed in the PDD	OK	OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project	1	DR	Section B 7.2 of PDD indicates the responsibilities.	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
management clearly described?					
D.5.2. Is the authority and responsibility for monitoring measurement and reporting clearly described?	1	DR 	Yes. Described in section B 7.2 of PDD.	OK	OK
D.5.3. Are procedures identified for training of monitoring personnel?	1	DR 	Refer A 2.6	OK	OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	1	DR 	There is no likely hood of any emergency situations related to emissions.	OK	OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	1	DR 	Procedures for calibration of monitoring equipment not identified and evident	CL 5	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	1	DR 	Procedures for maintenance of monitoring equipment and installations not identified and evident	CL 6	OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	1	DR 	Procedures for maintenance of monitoring measurements and reporting addressed in the PDD.	OK	OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	1	DR 	Day-to-day records handling, verification and storage of data is done by the project team as said in section B 7.2 of PDD	OK	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1	DR 	Refer D 5.5.	-	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.5.10. Are procedures identified for review of reported results / data?	1	DR	Procedures for review of reported results/data done is addressed in PDD	OK	OK
D.5.11. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	1	DR I	Procedures for internal audits not addressed in PDD	CL 7	OK
D.5.12. Are procedures identified for project performance reviews?	1	DR I	Procedures for project performance reviews indicated in section B 7.2 of PDD	OK	OK
D.5.13. Are procedures identified for corrective actions?	1	DR I	Procedures for corrective actions not addressed in PDD	CL 8	OK
E. Calculation of GHG emission It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	1	DR	Yes	OK	OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	1	DR	Yes	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	1	DR	Yes	OK	OK
E.1.4. Are the calculations documented in a complete and transparent manner?	1	DR	Yes	OK	OK
E.1.5. Have conservative assumptions been used?	1	DR	Yes	OK	OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	1	DR	Refer D 5.5	--	OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	---	OK
E.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK
E.2.5. Have conservative assumptions been used (if applicable)?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK
E.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?	1	DR	NA (as per decision taken in forty fourth meeting of Executive Board held on November 28, 2008)	OK	OK
E.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	1	DR	All sources are covered.	OK	OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	1	DR	Yes	OK	OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	1	DR	Yes	OK	OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	1	DR	Yes	OK	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	1	DR	Yes	OK	OK



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.3.6. Have conservative assumptions been used?	1	DR	Latest IPCC values have been considered	OK	OK
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	1	DR	Yes. The project replaces fossil fuel based electricity generation.	OK	OK
E.4.2. Is the table showing the aggregate emission reductions included in the PDD as per the format in guidance document?	1,2	DR	Yes, table showing the aggregate emission reductions included in the PDD.	OK	OK
F. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	1	DR I	Environmental impact assessment was not required by EPA, Sindh due to the nature and scale of project. (IEE) Initial Environmental Examination was performed however the report was not available.	CAR 5	OK
F.1.2. Does the project comply with environmental legislation in the host country?	1	DR I	A. It is not clear from PDD, whether the environmental clearance is obtained for this project.	CL 9	OK
F.1.3. Will the project create any adverse environmental effects?	1	DR	No adverse environmental effects are envisaged	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
F.1.4. Have environmental impacts been identified and addressed in the PDD?	1	DR	Refer F.1.3	OK	OK
G. Comments by Local Stakeholder					
Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	1	DR I	Section E 1 of PDD addresses the local stakeholders consultation process.	OK	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1	DR	Addressed in section E 1. However it is not clear from the PDD whether any stakeholder meeting is held. Due to the nature of the project, the mechanism of communication with the local stakeholders was found to be adequate.	CL 10	OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1	DR	Not specifically required.	-	OK
G.1.4. Is a summary of the comments received provided?	1	DR	As said in E 2 of PDD, no adverse comments were received during stake holder consultation.	OK	OK
G.1.5. Has due account been taken of any comments received?	1	DR	No adverse comments as reported in PDD.	OK	OK



VALIDATION REPORT

Table 3 Baseline and Monitoring Methodologies: AMS II.D. Version 11

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1. Baseline Methodology					
1. 1. Applicability					
1.1.1. Does the project activity comprises of any energy efficiency and fuel switching measure at a single industrial facility as defined the chosen methodology	3	DR I	The project activity involves setting up of 10 MW Combined Cycle Gas Turbine Project which involves energy efficiency and fuel switching simultaneously.	OK	OK
1.1.2. Is the energy saving of the project exceeding equivalent of 60 GWh _e per year or maximal saving of 180 GWh _{th} per year in fuel input?	3	DR I	The anticipated saving of the project would be around 147 GWh _{th} per year in fuel input.	OK	OK
1.1.3. Is it possible to directly measure and record the energy use within the project boundary?	3	DR I	Yes. As per section B.7.	OK	OK
1.1.4. Are the impacts of measures implemented (improvements in energy efficiency) by the project activity clearly distinguishable from changes in energy use due to other variables not influenced by the project activity?	3	DR I	Yes. The project involves energy efficiency by using gas turbine, waste heat recovery boiler and steam turbine replacing engines using heavy fuel oil, auxiliary boilers and gas generators. This would result in an increment in energy efficiency by 37%.	OK	OK
1.1.5. Is Natural gas is sufficiently available in the region or country?	3	DR	Yes.	OK	OK
1. 2. Project boundary					
1.2.1. Did the project participant account for the CO ₂ emission from electricity generation in fossil fuel fired power that is displaced due to project activity?	2,3	DR	Yes	OK	OK
1.2.2. Is the Project connected to the grid?		DR I	No, the project is completely designed to meet the internal electricity and steam requirement of GTML Unit 1, 2, 3.	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1.2.3. Are the geographical/ physical boundaries of the project clearly identified?	3	DR I	The Project site is located at GTML Unit 1, Landhi, Karachi, Sindh Province. The geographic coordinates are 24°50'16" N and 67°13'17".	CL 2	OK
1.2.4. Whether choice of inclusion/exclusion CH4 emissions in project and baseline are documented in PDD?	2,3	DR	The choice is documented in B.3 of PDD	OK	OK
1.3. Identification of alternative baseline scenarios					
1.3.1 Are the various options for alternatives explained in PDD?	3	DR	The alternatives considered are continuation of generation of steam and electricity through existing equipment natural gas and heavy fuel oil as the equipment is in sound working condition.	OK	OK
1.3.2. Is the explanation of these options transparent and complete	3	DR	Yes	OK	OK
1.3.3 Are the calculations for baseline is as per latest version of Type II.D. Version 11 as required by this methodology?	3	DR	Yes	OK	OK
1.3.4. Whether the project participant has used the steps as per Type II.D. Version 11 for defining the baseline scenario?	3	DR	Yes	OK	OK
1.3.5. Is the choice of financial indicators relevant and calculations transparent?	3	DR	The choices of financial indicators are addressed in the PDD.	OK	OK
1.3.9 Did the project participant provide evidence and supporting documents to exclude baseline options that do not comply with legal and regulatory requirements; or depend on key resources such as fuels, materials or technology that are not available at the project site?	3	I	There are no baseline options that do not comply with legal and regulatory requirements or no key resources such as fuels, materials or technology that are not available at the project site	OK	OK
1.4. Additionality					
1.4.1. Was the additionality of the project activity	3	DR	Being a small scale project the additionality has	CAR 6	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
demonstrated and assessed using the latest version of the "Tool for demonstration and assessment of additionality"?			been identified by barriers due to prevailing practise and investment barrier analysis. However the assumptions for internal rate of return are not substantiated		
1.4.2. Was the bench mark investment analysis done covering steps in 2b, 2c and 2d of the additionality tool	3	DR	See above.	-	OK
1.4.3 Is it demonstrated that the project activity is not common practice in the relevant country and sector by applying Step 4 (common practice Analysis)	3	DR	Yes	OK	OK
1.4.4 Is the impact of the registration of the project activity by applying Step 5 (Impact of CDM registration) described in PDD	3	DR	Impact of CDM registration addressed in PDD	OK	OK
1.5 Project Emissions					
1.5.1. Are the project emissions considered as CO2 emissions from on-site combustion of natural gas to generate electricity and steam.	3	DR	Yes	OK	OK
1.6. Baseline Emissions					
1.6.1. Are the baseline emissions determined according to the formula $BE_y = EG_y \times EF_{BL, CO_2, y}$	3	DR	Yes. The formula used is $BE_y = EG_y \times EF_{BL, CO_2, y}$	OK	OK
1.7. Leakage					
1.7.1. Is leakage considered?	3	DR	Leakage is not applicable as new equipment is being used in project and also according to the decision taken in forty fourth meeting of Executive Board held on November 28, 2008, the Board decided leakage from equipment transfer from within to outside the project boundary may be excluded from consideration	-	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1.8. Emission Reduction	3				
1.8.1. Did the emissions reductions were determined according to the formula $ER_v = BE_v - PE_v - LE_v$	3	DR	Yes	-	OK
1.8.2. Were all values chosen in a conservative manner and was the choice justified?	3	DR I	Refer to CAR 3.	-	OK
1.8.3. Whether an estimate of likely project emission reductions for the proposed crediting period is prepared as part of the PDD?	3	DR I	Yes.	OK	OK
1.8.4. Whether the estimate in principle employs the same methodology AMS II.D.?	3	DR I	Yes	OK	OK
1.8.5. Whether the emission factor is determined ex-post during monitoring?	3	DR I	IPCC 2006 Values are taken for various calculations.	OK	OK
2. Monitoring Methodology					
2.1. Applicability					
2.1.1. Is the project activity involves construction and operation of a new CCGT plant?	3	DR I	Yes. The project activity involves setting up of 10 MW combined cycle gas turbine with waste heat recovery boiler and steam turbine.	OK	OK
2.1.3 Is the monitoring methodology used in conjunction with the approved baseline methodology AMS II.D. ?	3	DR	Yes.	OK	OK
2.1.6. Is Natural gas is sufficiently available in the region or country?	3	DR	Yes.	OK	OK
2.2. Monitoring Methodology					
2.2.1. Does the monitoring plan require monitoring of electricity and steam generation from the proposed project activity?	3	DR	Yes.	OK	OK
2.2.3. Does the monitoring plan cover the primary	3	DR	Yes	OK	OK



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
parameters given under to be monitored during the crediting period? 1. Annual fuel(s) consumption in project activity. 2. Net Calorific Value(s) of the fuel used in the project activity. 3. Fuel emission factors for fuel used in the project activity.					
2.3. Quality Control (QC) and Quality Assurance (QA) Procedures					
2.3.1. Did all measurements use calibrated measurement equipment that is regularly checked for their functioning?	3	I	Refer CL 5	CL 5	OK

**Table 4 Legal requirements**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1. Legal requirements					
1.1. Is the project activity environmentally licensed by the competent authority?			The project does not require environmental licensing. However an IEE needs to be conducted which has to be reviewed by EPA. (IEE) Initial Environmental Examination was performed however the report was not available.	CAR 5	OK
1.2. Are the conditions of the environmental license being met?			Refer 1.1		OK
1.3 Are the conditions of the Designated National Authority being met?			Refer 1.1		OK



VALIDATION REPORT

Table 5 Resolutions of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
<p>CAR 1</p> <p>The projects spatial / geographical boundaries are not defined in Section B 3 PDD.</p>	<p>A 2.1 Table 2</p>	<p>Section B.3 of the version 1 of the PDD (PDD v1) already specifies that “The geographical boundary of the Project is the energy generation equipment located in unit 1 of Gul Ahmed Textile Mill Limited, which provides steam and electricity to units 1, 2, and 3” (section B.3 p.7)</p> <p>It has now been specified in the updated version of the PDD (v2) what this equipment comprises of: “Waukesha gas engines, Wartsila oil engines, gas-fired boilers, as well as the new gas-fired CCGT system “</p> <p>An aerial photograph has been added to section B.3 to show the location of this equipment in relation to the various units of Gul Ahmed Textile Mills.</p>	<p>The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CAR is closed.</p>
<p>CAR 2</p> <p>Applicability of chosen methodology is justified in Section B2 of PDD. How the energy efficiency is expected to increase approximately by 37%?</p>	<p>B 1.2 Table 2</p>	<p>The qualitative reason behind the energy efficiency increase has now been specified in section B.2: “This higher efficiency comes from the recovery of the waste heat from the gas turbine to produce steam</p>	<p>Verified section B.6.3 and found computation of baseline energy consumption, baseline emission, project energy consumption, project emission, emission reduction and energy saving performed appropriately. The increase in energy efficiency by</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
		<p>(cogeneration) and, once the steam turbine is installed, additional electricity (CCGT). By comparison, no waste heat was recovered from the engines for steam or electricity in the baseline".</p> <p>The quantitative figure of 37% comes from the calculation in paragraph 6 of section B.6.3, as was already specified in footnote 5. This figure is now 36% in the updated calculations (which use project-specific calorific values).</p>	36% found correct. Hence this CAR is closed.
<p>CAR 3 The current draft of PDD with baseline completion was completed on 12.December.2007. Refer B.8. However the date mentioned is not as per the dd/mm/yyyy format.</p>	<p>B 1.5 Table 2</p>	<p>The format of the date has been changed to 12/12/2007, in addition to other dates throughout the PDD.</p>	<p>The changes are incorporated in the revised version 13 of PDD dated 10/05/2010 . Hence this CAR is closed.</p>
<p>CAR 4 Determination of DATE Baseline Retrofit – the average technical lifetime of 2030 is indicated in the PDD. Conservativeness of 2030 is not addressed in the PDD Figure 5 in Annex 3 needs to be validated.</p>	<p>B 2.1 Table 2</p>	<p>The PDD v1 already has two pages (p.7-8) explaining why 2030 has been chosen in a conservative manner. It also refers to 4 figures in Annex 3, where certificates of maintenance have been provided.</p> <p>More details have now been added in</p>	<p>Conservativeness of 2030 as DATE Baseline Retrofit is discussed in detail and provides logical approach for determination. Hence this CAR is closed.</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
		Table 4 of PDD v2 for Wartsila engines, Waukesha engines, and boilers. These also refer to new attachments which have been added to Annex 3.	
<p>CAR 5</p> <p>Environmental impact assessment was not required by EPA, Sindh due to the nature and scale of project. (IEE) Initial Environmental Examination was performed however the report was not available.</p>	<p>F 1.1 Table 2 1.1 Table 4</p>	<p>The IEE report is now available and sent to the DOE as an attachment to this document. It is also referenced in Section D.</p>	<p>Reviewed the Executive Summary of IEE of Project performed by SGS and decision on IEE by Environmental Protection Agency, Government of Sindh on page 64 & 65 of revised version 13 of PDD dated 10/05/2010. Hence this CAR is closed.</p>
<p>CAR 6</p> <p>Being a small scale project the additionality has been identified by barriers due to prevailing practise and investment barrier analysis.</p> <p>However the assumptions for internal rate of return are not substantiated</p>	<p>1.4.1 Table 3</p>	<p>An "External benchmark" explanation was added to the PDD Section B.5 with supporting calculations in PDD Annex 3 Section 7 and Attachment L (including sources and benchmark calculations for 'expected return on equity' and 'Weighted Average Cost of Capital' (or 'WACC')). The conclusion of this section is that the IRR of the Project activity is lower than the resultant external benchmarks, and that the Project was therefore unattractive in the absence of the CDM, therefore supporting the argument that the Project is additional.</p>	<p>Verified and reviewed assumptions and computation of external benchmark involving risk free rate, equity return, WACC calculation and IRR through financial consultant (Ahsan Elahi Vohra) and all calculation found to be accurately computed, in accordance with generally acceptable accounting and IRR computation principles.</p> <p>Hence this CAR is closed.</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
<p>CL 1 Unique identification of the project activity lat/long is given in A 4.1.4 of the PDD. However the co ordinates are not in decimals</p>	<p>A.2.5 Table 2</p>	<p>More precise coordinates in decimal format (accompanied by a detailed location description) have now been added to section A.4.1.4: “The geographic coordinates of the site are 24° 50’ 18.52” N and 67° 13’ 18.66” E. The site is situated on the north-east edge of the Gul Ahmed Chowrangi roundabout, and 8.5 kms south-east of Karachi International Airport, at an elevation of 33 metres above sea level.”</p>	<p>The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed</p>
<p>CL 2 In section C.1.1 of PDD construction start date of gas turbine 27 July 2005 Expected Operational lifetime is more than 25 years. To be verified</p>	<p>C 1.1 Table 2</p>	<p>Confirmation from the manufacturer has been obtained illustrating that Solar Gas turbines can last for more than 20 years – see the paragraph added in section C.1.2: “More than 25 years. This is common knowledge, and has been confirmed by the manufacturer to Gul Ahmed on 27/05/2008: “well maintained Gas Turbines can run over 25 years. Solar Gas Turbines installed in Sui Northern Gas Pipelines in 1966 and 1969 are still operating” (see Figure 8 in Annex 3).”</p>	<p>This was verified by Mr. Khalid Ijaz (Sector Specialist) and based on the evidence provided in figure 7 & 8 pages 48 & 49 found acceptable. Hence this CL is closed.</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
CL 3 Renewable crediting period is chosen. The start date of crediting period is mentioned as 01 March 2008 Not in ddmmyyyy format. However the start date of the crediting period is already crossed.	C 1.2 Table 2	The format (see CAR 3) and date have been changed in the new section C.2.1.1: "01/10/2009 or date of registration, which ever occurs later."	The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.
CL 4 It is not clear how the energy savings of 150 GWh _{th} is arrived at	D 1.4 Table 2	All calculation steps are explained one by one in Section B.6.3 of PDD v1. For further details, the spreadsheet used to calculate those savings and emission reductions was also sent to the validator. Now the figures have slightly changed, due to the use of a more accurate value of the gas calorific value. The new figures have been inserted in PDD v2, and the updated spreadsheet is sent as an attachment to this document.	Verified the calculations incorporated in revised version 13 of PDD dated 10/05/2010 and also supported spreadsheet. The computation of energy savings around 147 GWh/yr found accurate. Hence this CL is closed.
CL 5 Procedures for calibration of monitoring equipment not identified and evident	D 5.5 Table 2 &	Details have been added in Section B.7.2, which includes the references used to determine the calibration frequency, and specifies that a calibration certificate will be issued	The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
	2.3.1 Table 3	each time external vendors perform calibration.	
CL 6 Procedures for maintenance of monitoring equipment and installations not identified and evident	D 5.6 Table 2	Details have been added in Section B.7.2: "During calibration by offsite vendors, meters will receive routine maintenance (e.g. replacement of parts, disassembly, cleaning, lubrication, and adjustments to meet manufacturers' specifications). If meters fail to calibrate within specifications, or fail to operate within typical parameters, they will receive special maintenance or repair by Gul Ahmed or an external supplier".	The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.
CL 7 Procedures for internal audits not addressed in PDD	D 5.11 Table 2	Details have been added in Section B.7.2: "Internal checks on the CDM parameters will be made during data collection and processing at Gul Ahmed, e.g. if meter readings are consistent with previous values, if there is any mistake in copying data from daily reports to monthly reports, etc. Gul Ahmed powerhouse also uses an	The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
		<p>internal auditing and corrective action procedure. This is a systematic procedure for taking timely and effective actions to correct and prevent non-conformities. It is based around a checklist which addresses CDM-related items such as steam, gas and electrical, as well as other items (e.g. demineralised water, hot water, fire and safety, etc.).</p> <p>EcoSecurities will also check data from the project and perform internal audits to ascertain that all CDM parameters are monitored with the right meter at the right frequency, that quality control procedures are in place, and that there are clear responsibilities in the organisation of the CDM monitoring system."</p>	
<p>CL 8 Procedures for corrective actions not addressed in PDD</p>	<p>D 5.13 Table 2</p>	<p>Details have been added in Section B.7.2: "Equipment will also be repaired or maintained outside of a calibration period if a meter shows signs of damage or abuse. In case a meter is out of order, an 'out-of-service' tag will be placed on the meter, and the</p>	<p>The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
		<p>calibration company will be called for re-calibration and repair. If this is not successful, the meter will be replaced. To determine the flows during the period when the meter is out of order, the following procedure will be followed:</p> <ol style="list-style-type: none"> 1. Count the number of days for which data (e.g. gas flow) is missing/questionable due to the meter being out of order 2. Calculate the average of the flow over this number of days prior to the malfunction of the meter 3. Apply this average flow for all the days the meter has been out of order. <p>For instance, if the meter has been out of order for 3 days, then 3 day average of the meter reading prior to its malfunction will be taken and applied to the 3 days over which the meter was out of order”</p>	
<p>CL 9 It is not clear from PDD, whether the environmental clearance is obtained for this project.</p>	<p>F 1.2 Table 2</p>	<p>Clearance has been obtained. This is clarified in Section D.1: “the Environmental Protection Agency (EPA) of the Government of Sindh, Karachi, has approved the project (on</p>	<p>The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 2,3	Summary of project owner response	Validation team conclusion
		02/05/2008) as per IEE guidelines" The approval of the EPA is included Annex 5 of the PDD v13.	
<p>CL 10 Addressed in section E 1. However it is not clear from the PDD whether any stakeholder meeting is held.</p>	<p>G 1.2 Table 2</p>	<p>No stakeholder meeting was held. Instead, stakeholder comments were solicited via:</p> <ul style="list-style-type: none"> • an announcement in the widely circulated newspaper "Business Recorder" • individual letters sent to key stakeholders in August 2007, detailing all aspects of the project (including technical, CDM, and environmental issues). <p>Please see the updated Section E in PDD v13 for more details, as well as the supporting evidence in Annex 5.</p>	<p>The changes are incorporated in the revised version 13 of PDD dated 10/05/2010. Hence this CL is closed.</p>

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Ref. 1: Guidelines for completing CDM-SSC-PDD Version: 01, Dated 22/10/2006

Ref. 2: Appendix B of the simplified modalities and procedures for small scale CDM project activities Version 06-02-03

Ref. 3: Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories II.D, version 11