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| | IS-CMS-MUC/Mu | +49 89 5791-2170 | +49 89 5791-2756 | 2008-04-10 | 1 of 15 |
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**Response to Request for Review**

Dear Sirs,

Please find below the response to the request for review formulated for the CDM project with the registration number 1545. In case you have any further inquiries please let us know as we kindly assist you.

Your sincerely,

Javier Castro
Certification Body Climate and Energy

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**Comment No.1:**

Further clarification is requested form the DOE on the level of assurance with which it has validated the CDM consideration, in particular with regard to the means of validating the closure of CAR5.

**Response by project proponent:**

Activities at H.& R. Johnson (India) Limited prior to the project activity : ----

Ceramic industry is energy intensive industry. In an effort to conserve energy H. & R. Johnson (India) Limited set up centralize energy management unit located at head office in Mumbai in the year 2001. This group was primarily responsible for energy conservation activities / fuel switch measures / promotion of renewable energy activities all across its four manufacturing units. This group was also entrusted with the responsibility to develop future CDM projects as an outcome of their efforts in the field of energy and environment in the year 2001 itself.

Energy management group started functioning with benchmarking activity (January, 2002) of HRJ energy consumption level and by comparing the same with international energy consumption level. We are attaching the copy of email exchanged with major international ceramic companies in this regard. (Please refer annexure 20).

After benchmarking activity HRJ, energy management group started working on energy audit activity in its manufacturing units. To do that it engaged one external energy auditing agency (July 2002). (Please refer annexure 19).

Energy management group was also working with various external agencies in gathering information about CDM and sustainable development. (Please refer annexure 18)

All these activities as indicated above proves that project proponent was quite proactive in the area of energy and environment prior to the project activity and was quite well aware of the facts of CDM and its procedures.

Chronology of project development:

We would like to present below the chronology of project development (with CDM consideration)

| Sr. No | Date | Description |
|---|---|---|
| 1 | 09.01.2003 & 10.01.2003 | Management decision to invest in the project with serious consideration of CDM revenues in Executive Committee Meeting. A presentation on CDM presented at the meeting. |
| 2 | 04.07.2003 | Purchase order placed for the FBC based Hot Air Generator |
| 3 | 14.04.2005 | Project commissioned successfully |

1. The time gap between the consideration of CDM revenue as necessary to overcome the barriers by the Board of PP and commencement of the project activity works out as 6 months.

This delay is primary on carrying out a minute technical detailing of the system, rounds of commercial negotiation with the various suppliers etc.

We are also attaching the purchase order raised as an evidence of date of commencement of project activity (annexure 3).

2. The time gap between the commencement of project activity and successful commissioning of the same works out as 21 months.

Design of hot air generator based on fuel specifications:

After finalization of order for hot air generator some specific requirements in terms of fuel specification asked by the equipment supplier. HRJ had to evaluate the specifications of biomass fuels that could be sourced from the surrounding area. In this process HRJ took about 8 months to narrow down on the specifications of renewable biomass. This information being critical to the design parameter of the hot air generator necessarily delayed the design of the hot air generator. To be more specific, the parameters like calorific value, ash content density of ash and fuel, physical size of the fuel and moisture contents and the choice of secondary biomass fuels have a direct bearing on the design aspect of the fuel preparation and feeding system, fluidizing system, ash collection and extraction system, cyclone separators.

After providing these inputs to the equipment supplier they started working on the design aspect of the hot air generator. They took almost 8 months to deliver the hot air generator which is the main equipment of the entire system. This is because of the limited technological know how available during that time.

On receipt of the main equipment construction and pre commissioning work initiated at site which took almost 4 months to complete.

Trial run and commissioning of the system in synchronization with the spray dryer operation took 1 month for completion.

In this way the implementation of the project took 21 months for completion.

Please refer the attached commissioning report (annexure 5)

Chronology of CDM cycle

| Sr. No | Date | Description |
|---|---|---|
| 1 | 09.01.2003 & 10.01.2003 | Management decision to invest in the project with serious consideration of CDM revenues in Executive Committee Meeting. A presentation on CDM presented at the meeting. |
| 2 | 12.01.2004 | CDM benefits for the project assessed by the consultant. |
| 3 | 14.12.2004 | CDM process progress discussed in the internal meeting |
| 4 | 26.07.2005 | CDM process progress discussed in the internal meeting |
| 5 | 11.10.2005 | CDM presentation given by the consultant |
| 6 | 27.03.06 / 31.03.06 | Communication with CDM consultant for offer finalization |
| 7 | 13.07.06 | Engagement letter signed for PDD development |
| 8 | 23.12.2006 | Change in the version of CDM PDD |
| 9 | Mar.2007 | Project submitted for validation |

HRJ had started the search for a competent CDM consultant to develop project design document at a very early stage even prior to the project implementation dated 12.01.2004 (please refer the copy of email exchanged with the consultant annexure 4), HRJ waited till 2006 to add more number of projects like Karaikal (status: submitted for registration with UNFCCC and ref no. is 1495), Dewas (status: registered with UNFCCC with ref no. 1543) and GT project in Pen (status: submitted for HCA approval).

Purpose of this waiting was to ensure a good quantum of CER in the kitty which would justify the engagement of various agencies like consultant, validator and all other associated cost involved.

Another important consideration was since all HRJ (up coming as well as existing) projects were small scale project clubbing the CER from all these projects will provide HRJ and edge to fetch a good price from the buyer for significant amount of CER.

Due to the above considerations project proponent hold the CDM application process activity for 9 months from date of commissioning of project activity.

However progress of CDM process were monitored through internal meeting dated 14.12.2004 & 26.07.2005 (annexure 10)

CDM consultant engagement process again initiated in Oct.2005 (please refer attached annexure 17). Please refer the attached communication with various consultants (annexure 6 and 7). After detailed discussions with various agencies, a consultant was appointed for the project activity in July 2006 (annexure 8). There was a delay in appointment of consultant due to various rounds of commercial negotiation. The entire process took more than 6 months for completion.

After appointment of consultant the PDD was prepared as per '**PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD) - Version 02',** but the version of PDD got revised in December 2006, which again caused delay in submission to the validator. Subsequently, PDD was prepared as per '**PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD) - Version 03'.** Moreover, the approved methodology, AMS I.C., was also revised in December 2006 from version 8 to version 9, which again resulted in revision of the PDD.

All of this resulted in delay in appointment of validator, and subsequently the PDD was prepared according to revised methodology and PDD form and was submitted to validator in March 2007. Thus, there was a delay of 8 months in project submission for validation from the date of engagement of consultant.

From all the communication as indicated above it is well evidenced that CDM was seriously considered during the project conceptualization as well the process was well monitored from time to time. Though the entire process has took quite a long time for completion CDM was a serious consideration throughout the cycle.

**Response by TÜV SÜD:**

CAR 5 was closed in the validation protocol based on the onsite verification of the documents which clearly evidenced the sequence of events in relation to CDM consideration as well as project implementation. Decision to implement the project activity by project participant (PP) was made by taking CDM into consideration in January 2003 (Annexure 1.0 and Annexure 2.0).

The real action to implement the project activity was started in July 2003 with ordering of equipments (Annexure 3.0). The process to avail CDM benefits was started in January 2004, with request for proposal from consultants for preparation of PDD (Annexure 4.0) which means the real action on starting the validation process. **Hence there was a delay of only 5 months from start of project activity in July 2003 to enquiry flotation for PDD consultants in January 2004**.

The time gap between the commencement of project activity and successful commissioning of the same works out as 21 months (Annexure 5.0). This is mainly due to different technical problems which have been actually experienced by PP because of inexperience to handle such kind of project. The same issues were also discussed in the board meeting dated 9th and 10th January 2003 (Annexure 1.0 and Annexure 2.0). This also strengthens the additionality of the project. The same has also been described in page 20 and 21 of final PDD version 3. DOE has validated all the inputs at site with authentic documents and all the proofs have already been submitted to EB as additionality proof documents during request of registration.

Regarding the CDM process initiation, the initiation of CDM consultant appointment has started in early 2004, engagement process again initiated in late 2005 (annexure 4, annexure 6, annexure 7 and annexure 17). After detailed discussions with various agencies, a consultant was appointed for the project activity in July 2006 (annexure 8). There was a delay in appointment of consultant due to various rounds of commercial negotiation. The reason behind the delay of initiation of engagement process is mainly to ensure a good quantum of CER which would justify the engagement of various agencies like consultant, validator and all other associated cost involved. Another important consideration was since all HRJ (up coming as well as existing) projects were small scale project clubbing the CER from all these projects will provide HRJ an edge to fetch a good price from the buyer for significant amount of CER. The same justification was discussed in details in subsequent internal meeting dated 14 December, 2004 and 26 July, 2005 which has been headed by the President – Corporate project of the organisation (Annexure 10). DOE has validated the complete minutes of all these meeting from H.& R. Johnson record archival system.

Further, audit team feels that the PDD was ready by December 2006, which is normal time for preparation of PDD (March 2006 to December 2006). However, due to change in version of small scale PDD template from 2 to 3 and revision of methodology approved methodology, AMS I.C from version 8 to version 9, which again resulted in revision of the PDD led to further delay in submission of PDD to DOE. The validation process was started in April 2007.

We would like to confirm that the evidence of prior consideration of the CDM in the decision by the project participant to undertake the project activity has been validated by us. The evidence is extract of the discussion of The Executive Committee headed by Managing Director (Annexure 9)**,** held on 10 January 2003 and subsequent internal committee meeting minute which was headed by President (Annexure 10). The board resolution document in third last paragraph clearly states that **"revenue generated through sale of carbon credits may make project quite viable".** In last paragraph it states that **"the committee has agreed to take necessary steps for getting this project registered for carbon credits".** Audit team would also like to emphasis here responsibility of the person who has signed this document. Mr. Vijay Aggarwal, who is the Managing Director has signed the document and is head of the company. The further minutes of internal meeting also strengthen the fact that the CDM consideration was strongly taken for this project which was continuously monitored by senior management at various stages (Annexure 10).

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Based on the presumption that the Managing Director is acting responsibly in accordance with his position, it can be confirmed with reasonable level of assurance (terminology used by INTERNATIONAL STANDARD ON ASSURANCE ENGAGEMENTS 3000) that CDM was seriously considered in the development of this project activity. Hence it can be confirmed with reasonable level of assurance that CDM was necessary to go ahead with the project activity. Therefore TÜV SÜD submitted the project for registration.

**Comment No.2:**

Para B.5.13 of the VR states: .Minutes of Board of Directors meeting dated 9th and 10th January 2003 has been submitted. This demonstrates that the CDM was considered in the management decision for implementing the project activity.
This however is not sufficient evidence to demonstrate that CDM was seriously considered at the start of the project. More evidence is necessary to demonstrate how it was considered that the expected additional income from the CDM was essential for the decision to go ahead with the implementation of the project activity. This evidence shall also be validated by the DOE.

**Response by project proponent:**

We have provided the meeting agenda as well as detail minute of the Executive Committee meeting pertaining to the CDM consideration for the project dated 10th Jan.2003. Please refer to the minute *"Item no 6 , CAPEX proposal for plant "* Under the agenda item *"Kunigal & Dewas direct HAG for Spray Dryer "* it is clearly explained why CDM was necessary to go ahead for the project. Input for this minute was taken from a presentation which is also attached for you ready reference.

As per the minute as well as presentation using coal was a preferred option over biomass due to its abundant availability and less cost. Economics as explained in the minutes are as below

1 kg of coal emits 1.72 kg of CO2

1 kg of renewable biomass emits 0 kg of CO2 ( Biomass is carbon neutral fuel)

1 ton of CO2 future price $15 = Rs.675 (1 USD = 45 INR)

1 kg of CO2 future price = Rs. 0.675

1.72 kg of CO2 future price = Rs. 1.161/ per kg of coal

Indicative coal cost presented (in and around Kunigal) as Rs. 2000 / ton and biomass cost is Rs. 2050 / ton. Around 1.5 kg of biomass will be required to substitute 1 kg of coal. Therefore against Rs. 2000 / ton of coal , biomass requirement would be Rs. 3075 /ton, we have a carbon credit benefit of Rs. 1161 / ton of biomass being used in the facility, therefore net biomass cost comes out to be Rs. 1914 / ton of biomass.

Therefore with the consideration of CDM benefit only biomass becomes a cheap source of energy. Without CDM benefit as indicated above the project is not economically viable.

A detail meeting agenda along with minute relevant of CDM (Item no 6) of the Executive Committee meeting is attached. (Annexure 1).

We are also attaching the presentation (annexure 2) given in the EXCOM meeting for the project by Energy Management Group and CDM consideration for the project.

From the above documents it is well evidenced that additional revenue from CDM was necessary for go ahead with the project activity and CDM revenue was seriously considered at the start of the project.

**Response by TÜV SÜD:**

Decision to implement the project activity by project participant was made by taking CDM into consideration in January 2003. We would like to confirm that the evidence of prior consideration of the CDM in the decision by the project participant to undertake the project activity has been validated by us. The evidence is extract of the discussion of The Executive Committee headed by Managing Director (**Annexure 9**), held on 09 and 10 January 2003. This document in third last paragraph clearly states that **"revenue generated through sale of carbon credits may make project quite viable".** In last paragraph it states that **"the committee has agreed to take necessary steps for getting this project registered for carbon credits".** Audit team would also like to emphasis here responsibility of the person who has signed this document. Mr. Vijay Aggarwal, who is the Managing Director has signed the document and is head of the company. In addition, as mentioned in the review comment, we have also validated the complete minutes of meeting dated 09 and 10 January 2003 (Annexure 1). The agenda of the meeting is very explicit regarding the CDM consideration. We have also checked the complete presentation made by the PP to their Managing Director in relation to this project (Annexure 2) as an input to CDM consideration. We have checked all these record from the data archival system of H.& R Johnson. Being a ISO 9001 certified company, H & R Johnson maintain quite a reliable document and data control archival system which in turns give us a assurance of authenticity of all the documents. Finally, to make ourselves more confident we have also checked the CAPEX approval which is signed by the top management. The CAPEX approval (Annexure 11) clearly specifies the CDM consideration which further supports our acceptance to Board of Director meeting as CDM consideration.

Based on the presumption that the Managing Director is acting responsibly in accordance with his position, it can be confirmed with reasonable level of assurance (terminology used by INTERNATIONAL STANDARD ON ASSURANCE ENGAGEMENTS 3000) that CDM was seriously considered in the development of this project activity. In addition to it, as mentioned above we have validated the complete minute of meetings (Annexure 01), presentation made on 09 and 10 January 2003 (Annexure 02) and CAPEX approval (Annexure 11) which strongly supports the CDM consideration for this project. Hence it can be confirmed with reasonable level of assurance that CDM was necessary to go ahead with the project activity. Therefore TÜV SÜD submitted the project for registration.

**Comment No.3:**

Further clarification is required on how the appropriateness of the input values to the cost calculation, in particular the use of inconsistent values for coal consumption in the cost analysis (5,269 T/year) and the emission reduction calculations (6,807 T/year), have been validated.

**Response by project proponent:**

Difference in coal consumption values have been observed in hot air costing and emission reduction calculation is due to the fact that the project proponent has used two different sources of data for both the calculation.

Hot air costing calculation has been done based on the historical furnace oil consumption data whereas emission reduction calculation has been done based on the design data of HAG.

Emission reduction calculation has undergone a series of change as per the methodological requirements during validation stage. (Please refer CAR 7 of the validation report for changes in baseline calculation)

Hot air cost analysis (coal consumption 5269 MT/ year):

Prior to the installation of HAG project proponent used to fire furnace oil (FO) in the spray dryer. Average annual consumption of FO was 1951 MT / year.

Now to calculate 1kg of FO is getting replaced by how many kilograms of coal, project proponent has divided net calorific value of FO (9506 kcal/kg) by net calorific value of coal (4300 kcal/kg) and by doing so they arrived at a fuel replacement ratio ( FO / coal ) 2.2. That means 1 kg of FO is getting replaced by 2.2 kg of coal.

Further since FO firing system was attached to the spray dryer and inherently liquid fuel firing system efficiency is much more than solid fuel firing system, therefore system losses are considered negligible.

Whereas in the FBC based hot air generator firing solid fuel like coal as a fuel, system efficiency is considered as 83%.Therefore the fuel replacement ratio as calculated above is rectified by dividing the same (2.2) by 0.83 (efficiency of the FBC based hot air generator). By doing so project proponent has arrived the fuel replacement ratio as 2.7. That means 1 kg of FO is getting replaced by 2.7 kg of coal.

Finally by multiplying average annual FO consumption i.e. 1951 MT by 2.7 (fuel replacement ratio as derived above) project proponent has arrived at the annual consumption figure as 5269 MT/year.

Emission reduction calculation (coal consumption 6,807 MT/year):

In the emission reduction calculation design data value and efficiency value of the FBC based hot air generator (HAG) as provided by the supplier have been used to derive emission reduction.

As per the datasheet we have considered 25000 kg / hr (M) as the flow rate of hot air and 650 deg C as temperature of hot air at the exit of FBC. Considering average ambient temperature as 35 deg C and specific heat of hot air as 0.266 kcal/kg$^0$C (S) , energy outflow from the HAG comes out 4089750 kcal / hr ( M X S X • T ) , where • T = (650 – 35).

In the next step of the algorithm energy outflow from HAG (4089750 kcal / hr) is multiplied by operating hrs per day and annual operating days to arrive the annual energy output from the HAG. Then the same has been divided by net calorific value of coal (4300 kcal/kg) to derive the

annual coal consumption (5650 MT/ annum) which is equivalent energy output from the HAG. Therefore finally to derive the net coal consumption as input to HAG, annual coal consumption figure have been divided by the designed efficiency of the HAG (83%). Thus we arrive at the figure of 6,807 tons of coal consumption per annum in the emission reduction calculation sheet.

**Response by TÜV SÜD:**

Difference in coal consumption values have been observed in hot air costing and emission reduction calculation is due to the fact that the project proponent has used two different sources of data for both the calculation. The final emission reduction calculation has been done at very later stage and changed from the initial due to various points raised during the validation.

Hot air costing calculation has been done based on the historical furnace oil consumption data, actual NCV value of coal and FO and efficiency data of the hot air generator. The consumption of the FO was taken from the actual FO consumption data of 2002-03 and 2003-04. The Net Calorific Value (NCV) value of FO and coal was referred from the supplier data which is validated by DOE. The efficiency of the hot air generator system was also based on the supplier offer letter which is also validated by DOE. Please refer to the hot air cost analysis excel sheet (Annexure 12 same was submitted while requesting registration) and also to the CAR 4 of the validation protocol.

Emission reduction calculation (Annexure 13) is based on the design data of HAG. The amount of coal which would have been used in absence of the project activity has been calculated by using the supplier design data of Hot Air Generator (HAG) and NCV of the coal. The same has been multiplied by the emission factor of the coal. The approach of baseline calculation is accepted by the audit team as the same is in the line of AMS I.C. requirements. (kindly refer to the Resolution 2 first paragraph, page 9 and 10 of validation report).

Hence, the input value for the coal consumption is justified in both of the cases and each data is validated by DOE for correctness. Further, DOE would also like to emphasis that the actual emission reduction in the crediting period will be purely on the basis of actual monitoring of emission reduction data as mentioned in the B.7.1. of final PDD version 3 and will have no relation with the estimated emission reduction value as mentioned in the current PDD.

**Comment No. 4.**

The DOE is requested to confirm that the procedure of measurement of flow rate and specific heat of the hot air to the spray dryer is reliable enough to guarantee an accurate emission reduction.

**Response by project proponent:**

Flow measurement using pitot tube**:**

Hot air flow at the output of the HAG is at very high temperature (600 to 700 deg C) and dust laden. Hot air duct connecting HAG to the spray dryer also having 1200 mm diameter. These features make the application technically not suitable for using an on line flow meter for the measurement of hot air flow to the spray dryer from FBC based HAG.

Most technically feasible solution was to use pitot tube assembly to measure the flow of hot air to the spray dryer. To ensure the maximum accuracy in measurements, it was described in the monitoring plan that flow will be measured once in a shift.

Provision for pitot flow measurement has been provided at the duct interconnecting HAG and spray dryer. Sufficient straight line length (4 meter before and after the point of measurement) has been provided to ensure minimum turbulence in the air flow and maximum accuracy in the measurement.

Pitot tube measures differential pressure with the help of a digital manometer connected to the pitot tube. By using this differential pressure data, inbuilt software in the digital manometer measures velocity and flow of hot air. This measurement removes the uncertainty involved in the manual calculation of flow and velocity from differential pressure.

Thermocouple provided with the digital manometer measures the temperature of hot air.

Please refer the attached details of digital manometer and pitot tube installed at the project proponent facility (annexure 14 & annexure 15).

As per the measurement procedure six readings are taken in single measurement at different pitot length covering the entire diameter of the duct. Interval between each measurement is kept as 5 mins. Then average values of all these five readings (both pitot flow (m3/hr) and temperature (deg C)) are considered as final value. Measurement is done once in every shift of operation (8hours).

Hot air generated from the FBC based HAG is utilized in the Spray Dryer. In Spray Dryer Slip (Ceramic slurry) particles are dried by a hot air flow emitted at *constant speed*, constant *pressure* and *constant volume*. A *uniform-density flow of slip is* finely balanced and spins around the central axis of the spray dryer.

This vortex is a finely-targeted stream of air which guarantees constant humidity and particle-size grading. Formation of this vortex is a function of tower temperature. A reasonably good vortex is achieved at a tower temperature of 600 deg C. Therefore lower temperature need to be maintained at constant temperature level.

Spray dried power requires constant moisture, to achieve this moisture level, slip fed into the spray dryer need to have uniform density to leave uniform moisture in the powder hence energy input to the spray dryer need to be constant. Energy input is provided by maintaining constant flow of hot air at constant temperature as indicated above.

The above explanation clearly indicates that volume and temperature of hot air supplied to the spray dryer is constant and monitoring of the same once in a shift is adequate enough.

Measured flow is then multiplied by the density of hot air (which is calculated from the measured temperature and the equation is mentioned in the section B.6.1. of the final PDD version 3) at the corresponding temperature to calculate the flow rate in kg/hr.

A detail chart of specific heat of hot air at different temperature from standard engineering hand book is maintained at project proponent facility. Specific heat corresponding to the measured temperature is referred from the chart. (Please refer annexure 16 for detail chart of specific heat and cover page of the book from where the chart is referred)

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Hot air flow (kg/hr) as calculated above is then multiplied by specific heat of hot air at that temperature and the differential temperature ( measured temperature minus ambient temperature) to arrive at the actual energy output from FBC based HAG ( kcal/hr).
Calibration Frequency :
Digital Manometer calibration will carried once in an year by external agency.

Accuracy and Uncertainties levels:
Pitot flow - Accuracy ±3% of reading ± 10m3/hr
Pitot Tube - Accuracy >1% for ± 10 deg alignment to
the fluid flow
Digital Manometer - Accuracy ± 0.5 of reading and
± 1 mm H2O

Calibration Frequency:
Thermocouple calibration will be done once in a year.
Accuracy and Uncertainties levels:
Digital Thermo couple - Accuracy - ± 0.5 of reading and ± 0.8 deg C

Flow measurement using pitot tube is carried out by our energy management group quite frequently for energy audit purpose. This is most convenient, proven and time tested means of measuring air flow.

**Response by TÜV SÜD:**

As per AMS I.C small scale methodology, monitoring shall be carried out using paragraph 11(a), which is metering the energy produced by a sample of the systems is where the simplified baseline is based on the energy produced multiplied by an emission coefficient. In the initial PDD, monitoring plan was not in compliance with the methodology. At the same time, considering the high temperature in the range of 600 – 700 deg C and the nature of dusty hot air, it was not technically feasible to install any flow meter for online measurement. Therefore PP decided to meter the hot air flow with the help of Pitot tube assembly. The method is one of the most primary techniques to measure velocity pressure and derive energy content in the thermal energy source medium. Pitot tube measures differential pressure with the help of a digital manometer connected to the pitot tube. By using this differential pressure data, inbuilt software in the digital manometer measures velocity and flow of hot air. This **measurement removes the uncertainty involved** in the manual calculation of flow and velocity from differential pressure. To **ensure the maximum accuracy in measurements**, it is described in the monitoring plan that flow will be measured once in a shift. For the specific heat, thermocouple provided with the digital manometer measures the temperature of hot air. Please refer the attached details of digital manometer and pitot tube installed at the project proponent facility (Annexure 14 & Annexure 15). As per the measurement procedure six readings are taken in single measurement at different pitot length covering the entire diameter of the duct. Interval between each measurement is kept as 5 mins. Then average values of all these five readings (both pitot flow (m3/hr) and temperature (degC)) are considered as final value. Measurement is done **once in every shift** of operation (8hrs) to **ensure maximum accuracy**. The explanation provided by project proponent above indicates that volume and temperature of hot air supplied to the spray dryer is constant and monitoring of the same once in a shift is considered adequate enough by audit team to ensure accurate emission reduction calculation. A detailed chart of specific heat of hot air at different temperature from standard engineering hand book is maintained at project proponent facility. Specific heat corresponding to the measured temperature is referred from the chart (Annexure 16). The method of monitoring fully adheres to the monitoring option (a) as

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per paragraph 11 of AMS I.C version 09, December 23, 2006. To ensure the accuracy of the emission reduction value, DOE has also validated the technical datasheet of Pitot Flow (Accuracy ±3% of reading ± 10m3/hr); Pitot Tube (Accuracy >1% for ± 10 deg alignment to the fluid flow) and Digital Manometer (Accuracy ± 0.5 of reading and ± 1 mm $H_2O$) and Digital Thermo couple (Accuracy - ± 0.5 of reading and ± 0.8 deg C) (Annexure 14 and Annexure 15). In addition, it has also been mentioned in the section B.7.1 of the final PDD that all the equipment used to monitor the flow rate and specific heat will be undergoing a regular calibration check by an authorised party once in a year. As the organisation has already established an quality management system which is certified for ISO 9001:2000 for last six years DOE is confident that the measurement of flow rate and specific heat will ensure the accuracy of emission reduction calculation in a maximum extent possible.