VERIFICATION AND CERTIFICATION REPORT

PetroChina Company Limited Liaoyang Petrochemical Company

N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company

Monitoring Period: 01/12/2009 – 13/03/2010

SGS Climate Change Programme
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Date of Issue:	**Project Number:**
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Project Title:	
N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company	
Organisation:	**Client:**
SGS United Kingdom Limited	PetroChina Company Limited Liaoyang Petrochemical Company
Publication of Monitoring Report:	
Monitoring Period:	01/12/2009 to 13/03/2010
First Monitoring Report Version and Date:	Version 1, dated 28/04/2010
Final Monitoring Report Version and Date:	Version 2, dated 28/05/2010

Summary:

SGS United Kingdom Ltd has performed the 10th periodic verification of the CDM project N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company with the UNFCCC Ref. Number 1238. The verification includes confirming the implementation of the monitoring plan of the registered PDD and the application of the monitoring methodology as per AM0021 version 1 dated 25/02/2005. A site visit was conducted to verify the data submitted in the monitoring report. SGS confirms the following has been reviewed;

(a) The registered PDD, including the monitoring plan and the corresponding validation report;

(b) Monitoring report, previous verification reports;

(c) The applied monitoring methodology AM0021 version 1;

(d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;

(e) All information and references relevant to the project activity's resulting in emission reductions

PetroChina Company Limited Liaoyang Petrochemical Company (hereafter "LYPC") has installed a catalytic decomposition facility to reduce the N_2O emissions from the registered adipic acid plant of the company. N_2O-containing off-gas from adipic acid production is firstly diluted with air sent in by the compressor, forming the diluted gas; this gas is preheated by the heat exchangers and electric preheater; then enters the catalytic DeN_2O reactor in which N_2O is converted into N_2 and O_2. Effluent from the DeN_2O reactor is fed into a subsequent DeNOx unit which abates NOx to comply with Chinese regulations; the off-gas from the DeNOx unit then enters a steam generator to utilize heat of the gas. This catalytic N_2O decomposition process does not consume natural gas or steam.

SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the validated and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in **3,718,409** tCO2e emission reductions during period 01/12/2009 up to 13/03/2010.

Subject:		
CDM Verification		
Verification Team:		
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Abbreviations

AdOH	Adipic Acid
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
COP/MOP	Conference of Parties / Meeting of Parties
DAS	Data Acquisition System
DCS	Distributed Control System
DeN_2O	N_2O abatement
DeNOx	NO_x abatement
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board of the Clean Development Mechanism
EF	Emission Factor
EMS	Environmental Management System
FAR	Forward Action Request
GC	Gas Chromatograph
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IETA	International Emission Trading Association
IPCC	Intergovernmental Panel on Climate Change
LYPC	Liaoyang Petrochemical Company
MP	Monitoring Plan
MR	Monitoring Report
OM	Operating Margin
PDD	Project Design Document
PP	Project Participants
PPM	Volumetric Part per Million
SGS	SGS United Kingdom Ltd
t	Metric Tonne
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1. Introduction

1.1 Objective

SGS United Kingdom Ltd has been contracted by PetroChina Company Limited Liaoyang Petrochemical Company to perform an independent verification of its CDM project "N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company", UNFCCC Ref. No. 1238. CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD and the approved methodology; and
- The data reported are complete and transparent.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

The verification 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 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company
UNFCCC Registration Number:	1238
Monitoring Period Covered in this Report	01/12/2009 to 13/03/2010 The 10th monitoring period (also the third and last monitoring period in the 2nd crediting year) of the first crediting period
Project Participant (host country)	PetroChina Company Limited Liaoyang Petrochemical Company
Location of the Project Activity:	Liaoyang City, Liaoning Province, People's Republic of China

A catalytic decomposition facility has been installed to reduce the N_2O emissions from the registered adipic acid production plant of the company. N_2O-containing off-gas from adipic acid production is firstly diluted with air sent in by the compressor, forming the diluted gas; this gas is preheated by the heat exchangers and electric preheater; then enters the catalytic DeN_2O reactor in which N_2O is converted into N_2 and O_2. Effluent from the DeN_2O reactor is fed into a subsequent DeNOx unit which abates NOx to comply with Chinese regulations; the off-gas from the DeNOx unit then enters a steam generator to utilize heat of the gas. This catalytic N_2O decomposition process does not consume natural gas or steam.

2. Methodology

2.1 General Approach

SGS's approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification Checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

2.2 Verification Team for this Assessment

Name	Role
Simon Zhao Xinguang	Team Leader/ Lead Assessor
Guy Liu Jianguo	Local Assessor
Michael Wu Shimin	Sectoral Expert

2.3 Means of Verification

2.3.1 Review of Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed by Simon Zhao and Guy Liu.

Location: Flare Street, Hongwei District, Liaoyang, Liaoning, China (PetroChina Company Limited Liaoyang Petrochemical Company)	
Date: 24/05/2010-25/05/2010	
Coverage: 10th periodic verification	**Source of Information / Persons Interviewed**
Interview with project participants, review of monitoring and operation status in this monitoring period. Review of onsite DAS/DCS data and curves, manual analysis records, daily event log and monthly statistics. Visual check on physical and spatial configurations of the project activity. Collection of calibration certificates and maintenance records of concerned measurement instruments. Inspection on established practices.	Mr. Yang Xiaolin, Vice Director of Programming & Planning Department(PPD) of LYPC Ms. Kang Xiaoqin, PPD of LYPC Mr. Zhai Changjun, Manager of AA production plant Mr. Zhang Yuanli, Chief Engineer of AA production plant Ms. Liu Huiyan, Senior Supervisor of CDM project Mr. Zhuang Kechen, Office supervisor of CDM project Mr. Liu Jiawei, Vice Director of AA unit Mr. Jiang Lin, Engineer of AA unit Mr. Zhang Yu, Engineer of instrument unit Mr. Feng Ge, Deputy Manager of Zhonghai Runda Scientific and Trading Co., Ltd. (Zhonghai) Ms. Zhou Zhen, Project Manager of Zhonghai Mr. Chen Xiaochuan, Project Assistant of Zhonghai

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

I. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;

II. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;

III. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

The verification process may be halted until this information has been made available to comply with the requirements of the CDM Executive Board. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A clarification request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

Corrective Action Requests and Clarification requests are raised in the Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to CLs and FARs.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period. FARs may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

All CARs, CLs and FARs for this verification period are included in this report.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Verification Findings

3.1 Project Implementation - General

Based on the project information available on the UNFCCC website, http://cdm.unfccc.int/Projects/DB/DNV-CUK1184240745.87/view (/1/), the project was registered on 30/11/2007 with the first crediting period as from 14/03/2008 to 13/03/2015. This is the 10th periodic verification covering the period from 01/12/2009 to 13/03/2010 which is coherent with the end of last monitoring period. This is also the third and last monitoring period in the 2nd crediting year (14/03/2009-13/03/2010) (/5/).

The project was registered against AM0021 version 1 dated 25/02/2005 (/2/). The monitoring methodology has been correctly applied and the documents for this periodic verification are complete and transparent. QA/QC procedures stipulated in the Monitoring Plan have been strictly followed.

The physical and spatial configuration of the project has been checked during site visit (/6/). The project boundary was consistent with one identified in the registered PDD (/3/).

This is the 10th monitoring period of this project, also the third and last monitoring period in the 2nd crediting year (14/03/2009-13/03/2010). The emission reduction was 2,826,781 tCO_2 for the period 01/12/2009 to 13/03/2010 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 3,718,409 tCO_2 for the same period which is higher than the above mentioned estimate in the registered PDD. Compared with concerned parameters estimated in PDD, this higher performance is mainly the result of the actual values of %_on-line (99.44%) and destruction rate (99.75%) are better than the conservative values (90% and 95%) used in the registered PDD, and the adipic acid production in this monitoring period is also higher than the average monthly level in the base year used to estimate the annual ERs in the registered PDD.

This is also the last monitoring period in crediting year 2 (14/03/2009-13/03/2010). Up to the end of this monitoring period, the accumulated emission reduction in current second crediting year is 12,896,966 tCO2e which is above the annual emission reduction of 10,017,235 tCO_2e estimated in the registered PDD. Besides the actual values are higher for parameters %_online and destruction rate (99.59% and 99.09% in this second crediting year), the higher ER in this crediting year is also a result of the higher annual adipic acid production (156,290.000 t) than the one used in the registered PDD (140,000.000 t). The annual cap of adipic acid production in this project had been determined to be 158,835.992 t rather than 140,000 t as per Paragraph 24 of EB48 meting report. Hence, 44,792.000 t, the total P_AdOH produced in this monitoring period was used in ER calculation for this monitoring period.

The comparison of the claimed emission reductions with the estimates in the registered PDD has been described in the monitoring report in accordance with EB48 Annex 68 “Guidelines on completeness check of requests for issuance”.

3.2 Remaining Issues, CAR’s, FAR’s from Previous Validation or Verification

After reviewing the previous Verification and Certification Reports, it was confirmed that the CARs or FARs from previous validation and verifications were closed out (/26/). There are no remaining issues.

3.3 Compliance of the monitoring plan with the monitoring methodology.

The registered monitoring plan is in consistency with the applied methodology AM0021 version 1 and relevant EB rules.

3.4 Completeness of Monitoring

Monitoring of reductions in GHG emissions to result from the registered project have been implemented in accordance with the monitoring plan in the registered PDD and relevant EB rules (/7/). The monitoring mechanism is effective and reliable. Detail information for each monitoring parameter is as follows:

3.4.1 Q_GE: Flow Rate of Effluent Gas (Nm^3/hr)

This parameter is measured continuously by an annubar flow meter with normalized output of flow rate (Nm^3/hr) to the standard temperature and pressure (0 degree Celsius and 1,013 bar). The DAS is recording the reading of the flow rate (Nm^3/hr) every second, forming a continuous flow curve over time.

Monthly total of Q_GE (Nm^3) reported in the MR as well as in the ER spreadsheet is for reference and reporting only as it is the real time value in every second which is actually used for the data processing for ND_N_2O, see section 3.4.3 below for more information.

The reported monthly total of Q_GE is verified against the data in all daily DAS reports and the monthly statistics (/20//22/) and found to be consistent with one another.

The annubar flow meter, the temperature transmitter and the pressure transmitter were replaced on 08/01/2010 for calibration purpose. These instruments were calibrated by officially accredited entities annually. The calibration certificates have been provided for verification. No errors were identified in these calibrations.

Calibration information of the annubar flow meter, temperature transmitter and pressure transmitter were verified as follows:

Instruments	S/N	Calibration date	Valid period (months)	Cert. Nr. (/8/)	National standard	Calibration entity (/15/)
Annubar flow meter (before replacement)	4989886/0068713	19/01/2009	12	0068713	MIL-STD 45662A	Colorado Engineering Experiment Station Inc.
Annubar flow meter (after replacement)	4924020/0054303	15/12/2009	12	CE10406	MIL-STD 45662A	Colorado Engineering Experiment Station Inc.
Temperature transmitter (before replacement)	0606/b842589937	19/01/2009	12	Liaoji 09011902502	JJF1183-2007	Liaoning Provincial Institute of Measurement
Temperature transmitter (after replacement)	b427668837	29/12/2009	12	Liaoji 09122902513	JJF1183-2007	Liaoning Provincial Institute of Measurement
Pressure transmitter (before replacement)	CF610UR252135	13/01/2009	12	Liaoji 09011302713	JJG882-2004	Liaoning Provincial Institute of Measurement
Pressure transmitter (after replacement)	CzzB075453	28/12/2009	12	Liaoji 09122802709	JJG882-2004	Liaoning Provincial Institute of Measurement

The reported information of the serial numbers of the annubar flow meters monitoring Q_GE is not complete in version 1 of the monitoring report. CAR #1 was raised for requesting the PP to provide complete information of the serial numbers of the annubar flow meters (including the Pitot Tube and the transmitter) in the monitoring report. In version 2 of the motoring report, the complete several numbers of the annubar flow meters (including the Pitot Tube and the transmitter) is provided. CAR #1 is closed out.

3.4.2 N_2O_GE: Concentration of N_2O in Effluent Gas (ppm)

This parameter is measured continuously by an online gas chromatograph (GC). The DCS and DAS record the reading of the online GC (ppm) every second, forming a continuous variation data set over time. The instantaneous concentration (ppm) in each second is multiplied with the value of Q_GE in the same second (Nm^3, see also section 3.4.1) and the specific gravity of N_2O (kg/Nm^3) to get the real time ND_N_2O (kg), the latter is then aggregated to the ND_N_2O (kg) for the given period. At the end of the month/period based on the total flow of Q_GE (Nm^3) as mentioned in section 3.4.1 and the total ND_ N_2O (kg), the equivalent concentration of N_2O for the month /period is calculated. Monthly equivalent N_2O_GE reported in the MR and ER spreadsheet is for reference and reporting only as it is the real time value of one second interval which is actually used in the data processing for ND_N_2O, see section 3.4.3 below for more information.

The reported monthly equivalent value of N_2O_GE was verified against the data of Q_GE and ND_N_2O in all daily DAS reports and the monthly statistics (/20//22/) and found to be consistent with one another.

The online GC was replaced on 21/01/2010. The calibrations were performed by an officially accredited entity as per national standard JJG968-2002 and JFZ(JLBZ-C-09)-02-2006. The calibration certificate has been provided for verification. No errors were identified in these calibrations.

Calibration information of the online GC was verified as follows:

Instruments	S/N	Calibration date	Valid period (months)	Cert. Nr. (/9/)	Calibration entity
Online GC (before replacement)	5500120010 (AT-2307)	06/03/2009	12	Liaoji 09030606303	Liaoning Provincial Institute of Measurement
Online GC (after replacement)	5500570010 (AT-2307)	21/01/2010	12	Liaoji 10030506601	Liaoning Provincial Institute of Measurement

3.4.3 ND_N_2O: the Quantity of N_2O not Destroyed (t)

The quantity of N_2O not destroyed (ND_N_2Oy) is obtained by constantly monitoring the flow (Q_GE, discussed in section 3.4.1 above) and the concentration (N_2O_GE, discussed in section 3.4.2above) of the gaseous effluent from the decomposition facility. The formula is:

ND_ N_2O = Q_GE × N_2O_GE

The simultaneous monitoring results of Q_GE and N_2O_GE at one second interval were used by the DAS to calculate the volume of N_2O not destroyed for each second interval, density of N_2O at standard temperature and pressure (0 degree Celsius and 1,013 bar), known as "specific gravity of N_2O ($44/22.414\times10^{-6} kg/Nm^3$)", is used to convert the volume to mass in kg, every second results of ND_N_2O are then aggregated daily and then monthly by DAS.

The reported monthly total of ND_N_2O is verified against the data in all daily DAS reports and the monthly statistics (/20//22/) and found to be consistent with one another.

3.4.4 %_on-line: Percentage of Close Time of Bypass Valve to Production Time of AdOH (%)

The parameter is acquired from the following formula:

%_on-line = TIME002/TIME001, where:

TIME001: production time of AdOH;

TIME002: close time of the bypass valve when AdOH is in production

TIME001 and TIME002 are counted and archived in the DAS. It is set in the DAS that the counting of TIME002 can only be active when the TIME001 is running.

The pipe connections in relation to the N_2O decomposition facility has been checked through the detailed installation chart and also through visual inspection onsite. It is confirmed that only one feeding pipe is connected to the DeN_2O reactor and one unique bypass valve joint with the feeding pipe. As per the specification of the automatic control system (/17//18/), under certain operation conditions of the DeN_2O facility, the connecting valve and the bypass valve is possible to be open together; on the other hand, an interlock is in place that when the connecting valve is closed, the bypass valve is open. Hence, the close time of the bypass valve (a) ≤ the open time of the connecting valve (b), thus for TIME002, counting (a) is a more appropriate approach than counting (b).

The daily %_on-line is verified against the data in all daily DAS reports. The daily (1-%_on-line) is then multiplied with the daily Q_N_2O (baseline N_2O emission) to get the daily Q_N_2O_by-pass$_d$, the latter is aggregated monthly. The %_on-line of the month is then calculated as: %_on-liney = 1- (Q_N_2O_by-pass$_y$/Q_N_2O_y). Hence the reporting of monthly equivalent %_on-line in the MR and ER spreadsheet is only for reference and reporting only as it is the daily values which are actually used in the data processing for Q_N_2O_by-pass.

Periodic check of tightness of the valves to assure ~~the~~ good operation performance has been included in the monitoring manual and being implemented (/18/). No leakage of the valves was reported, which was also verified against the raw records of the field inspections.

3.4.5 P_AdOH: Adipic Acid Production (t)

Adipic acid is final product of AdOH plant and the P_AdOH is directly measured by automatic quota packaging machines, each package is marked with its ID number and is recorded in the production log.

The automatic quota packaging machines were calibrated twice a year by an officially accredited entity as per the national standard JJG539-1997. The calibration certificates have been provided for verification. No errors were identified in these calibrations. Calibration information was verified as follows:

Instrument	S/N	Calibration date	Valid period (months)	Cert. Nr.(/10/)	Calibration entity
Four automatic quota packaging machines	04042001-U, 04042002-U, U84Z404A, U84Z404B	10/07/2009	6	04200904320, 04200904319, 04200904321, 04200904322	Liaoyang Institute of Measurement and Testing
		06/01/2010	6	04201000014, 04201000015, 04201000012, 04201000013	Liaoyang Institute of Measurement and Testing

The reported monthly data for P_AdOH were verified against the data in all daily raw production logs and monthly statistics (/20//22/), these data were found to be consistent with one another.

For seeking clarity for determining the AdOH production eligible for crediting by projects applying AM0021 version 1, SGS submitted a clarification request (AM_CLA_0148), in EB 48 meeting report paragraph 24 (/29/), the Board "*clarified that the cap on adipic acid production of the facilities shall be the validated maximum daily production of adipic acid multiplied by 365 days multiplied by the operational rate. The validated maximum daily production of adipic acid shall be achieved by the end of year 2004.*"

Following paragraph 24 of EB 48 meeting report, it was verified by the SGS assessment team that the validated maximum daily production of AdOH achieved by the end of year 2004 was 477t, as shown in the registered PDD (Page 5), DNV's validation report of the project (Page 14, 53) (/4/) and DNV's response to the

request for review at registration (available on the website of http://cdm.unfccc.int/Projects/DB/DNV-CUK1184240745.87/history). The production log in Dec 2004 (/31/) has been provided by the project participant for cross checking the validation result of DNV.

The verified accumulated shutdown time of the adipic acid plant in 2004 was 768.5 hours (/30/), so the operational rate in 2004 is calculated to be 91.23% (= (8760-768.5) h /8760h × 100% =7991.5h/8760h × 100%).

Thus, according to paragraph 24 of EB 48 meeting report, the cap on adipic acid production in this project has been determined to be 158,835.992t (=477t/d×365×91.23%). This annual cap has been accepted by the CDM EB at its 52nd meeting (/35/).

This is the third and last monitoring period in 2nd crediting year. Up to the end of this monitoring period, it is verified that the accumulated adipic acid production of 156,290.000 t is within the annual cap of 158,835.992 t as calculated above. Therefore, 44,792.000 t of P_AdOH produced in this monitoring period was accepted for ER calculation as per EB 48 Paragraph 24.

3.4.6 Q_N_2Oreg: Allowed N_2O Emissions (kg/year)

According to the AM0021 version 1, this parameter is monitored for the possible adjustment of the calculation of baseline N_2O emissions.

The PP has dedicated staff to keep the company updated with the latest environmental regulations and laws. It has been a routine EMS procedure of PetroChina Company Limited Liaoyang Petrochemical Company (/19/).

It was verified against the official website of National Development and Reform Commission, Ministry of Environmental Protection of People's Republic of China that there was no regulation or law restricting N_2O emissions in China up to the end of this monitoring period.

3.4.7 N_2O reg/AdOH: Allowed N_2O Emissions / kg of Adipic Acid Produced (kg/kg)

According to the AM0021 version 1, this parameter is monitored for the possible adjustment of the calculation of baseline N_2O emissions.

The PP has dedicated staff for keeping the company updated with the latest environmental regulations and laws. It has been a routine EMS procedure of PetroChina Company Limited Liaoyang Petrochemical Company (/19/).

It was verified against the official website of National Development and Reform Commission, Ministry of Environmental Protection of People's Republic of China that there was no regulation or law restricting N_2O emission rate to AdOH production in China up to the end of this monitoring period.

3.4.8 r_y: Share of N_2O Emissions Required to be Destroyed (%)

According to the AM0021 version 1, this parameter is monitored for the possible adjustment of the calculation of baseline N_2O emissions.

The PP has dedicated staff to keep the company updated with the latest environmental regulations and laws. It has been a routine EMS procedure of PetroChina Company Limited Liaoyang Petrochemical Company (/19/).

It was verified against the official website of National Development and Reform Commission, Ministry of Environmental Protection of People's Republic of China that there was no regulation or law requiring destruction rate of N_2O emissions in China up to the end of this monitoring period.

3.4.9 Q_Power: Electricity Consumption by the Decomposition (kWh)

This parameter is measured continuously by three electricity meters and accumulated data is recorded in the DAS.

The reported monthly data for Q_Power in MR were verified against the data in all daily DAS reports and the monthly statistics (/20//22/) and found to be consistent with one another.

The three electricity meters were calibrated by an officially accredited entity once every three years as per the national standard JJG596-1999. The calibration certificates had been provided for verification. No errors were identified in these calibrations. The calibration information of three electricity meters was verified as follows:

Instrument	S/N	Calibration date	Valid period (months)	Cert. Nr. (/11/)	Calibration entity
Three Electricity meters	08010050001	16/01/2008	36	DC820005	Liaoyang Institute of Measurement and Testing
	08020130041	03/03/2008	36	DC820013	
	08020130040	03/03/2008	36	DC820014	

3.4.10 E_Power: CO_2 Emission Factor for the Electricity Consumption (kg-CO_2/kwh)

According to the registered monitoring plan of the project, "*the parameter is taken as the highest of the average operating margin (OM) and the build margin (BM) calculated according to ACM0002 for the grid connected to the facility*".

OM and BM of the connected grid of Northeast China Power Grid (NECPG) published by Chinese DNA on 18/07/2008 was 1.2561kg-CO_2/kWh and 0.7946 kg-CO_2/kWh. OM and BM of NECPG published by Chinese DNA on 02/07/2009 was 1.1293 kg-CO_2/kWh and 0.7242 kg-CO_2/kWh (/24/). As a conservative approach, the highest OM of 1.2561kg-CO_2/kWh was set as E_Power for this monitoring period as per the registered monitoring plan.

3.4.11 Q_Steam_p: the Steam Generated During the Process of Decomposition (t)

The parameter is measured continuously by steam meter and accumulated data is recorded in the DAS.

The reported monthly data for Q_steam_p in MR were verified against the data in daily DAS reports and the monthly statistics (/20//22/) and found to be consistent with one another.

The steam meter was calibrated by an officially accredited entity on 23/02/2009. The calibration certificate valid for 24 months as per the national standard JJG640-1994 had been provided for verification. No error was identified in this calibration. The calibration information of the steam meter is verified as follows:

Instrument	S/N	Calibration date	Valid period (months)	Cert. Nr. (/12/)	Calibration entity
Steam meter	HVS71025	23/02/2009	24	Liaoji 09022302101	Liaoning Provincial Institute of Measurement

3.4.12 E_Steam_p: CO_2 Emission Factor of Steam (kg-CO_2/kg-steam)

According to the registered monitoring plan, this parameter is to be acquired from actual coal consumption rate from the steam supplier of Liaoyang Petrochemical Company Thermal Power Plant, multiplying the ex-ante fixed NCV_{coal} and $COEF_{heat}$. Only the coal consumption rate is to be monitored.

Standard coal consumption rate for generating steam of '0.0911 kg-ce/kg-steam' in 2009 was adopted for determining E_Steam in this monitoring period which was verified to be consistent with the document provided by the steam supplier Liaoyang Petrochemical Company Thermal Power Plant (/23/). In this monitoring period, E_Steam was calculated to be 0.2624 kg-CO_2/kg-steam and verified to be correct.

3.4.13 P_N_2O: the N_2O Price ($/t)

This parameter is monitored through market survey.

There is no market in China for this kind of N_2O as by-product from AdOH process, nor is there feasibility for LYPC to extract the N_2O from the gas stream for sale.

3.4.14 HNO_3_consumption: Nitric Acid Consumption in the Adipic Acid Production Process (t)

The HNO_3 consumed in the AdOH production process is supplied by two separate HNO_3 plants of LYPC (Plant 1 and Plant 2 in following text).

HNO_3 from Plant 1 and Plant 2 is measured through flow meters for the gross mass and through standard titration instruments for the concentration. The daily flow data of HNO_3 (t) is recorded in DAS, it is then multiplied with the corresponding daily concentration to get the daily pure HNO_3_consumption (t). Then, the daily quantity of the two plants is summed up and aggregated monthly.

The reported monthly data for HNO_3_consumption in MR were verified against the data in all daily DAS flow data and corresponding daily concentration of HNO_3 from Plant 1 and Plant 2; data in the monthly statistics (/20//21//22/) were also checked and found to be consistent with one another.

The flow meter installed at HNO_3 Plant 1 was replaced on 16/12/2009 for calibration purpose. The flow meters were calibrated annually by an officially accredited entity as per the national standard JJG1038-2008. The calibration certificates have been provided for verification. No errors were identified in these calibrations. The calibration information of the instruments is verified as follows:

Instrument	S/N	Calibration date	Valid period (months)	Cert. Nr. (/13/)	Calibration entity
Flow meter (HNO_3 Plant 1, before replacement)	413105/3032717	24/12/2008	12	Liaoji 08122402202	Liaoning Provincial Institute of Measurement
Flow meter (HNO_3 Plant 1, after replacement)	413106/3032737	16/12/2009	12	Liaoji 09121602201	
Flow meter (HNO_3 Plant 2)	C40E4C02000	20/11/2009	12	Liaoji 09112002201	

3.4.15 HNO_3_physical: Nitric Acid Physical Losses in the Adipic Acid Production Process (t)

This parameter consists of 4 parts as follows: (1) NO_3^- in aqueous waste; (2) NO_3^- in the by-products; (3) NO_3^- in AdOH production; (4) NOx in the reaction off gas. Monitoring of these items is through flow meters for the gross mass or volume, and spectrophotometers and online Infrared (IR) analyzers for the concentration of NO_3^- and NOx.

For each of the 4 sources, the daily flow data are recorded in DAS, it is then multiplied with the corresponding daily concentration data and converted to the daily HNO_3 loss equivalent, and the latter is aggregated monthly. The concentration analysis is performed by experienced operators.

The reported monthly data for HNO_3_physical in MR were verified against the data in all daily DAS flow data, the corresponding concentration data and the monthly statistics (/20//21//22/) and found to be consistent with one another.

The flow meter measuring the by-product and the flow meter measuring the bypass flow were replaced on 02/12/2009 and 03/02/2010 respectively for calibration purpose. The relevant instruments measuring this parameter were calibrated by officially accredited entities. The calibration certificates have been provided for verification. No errors were identified in these calibrations. The calibration information of the instruments is verified as follows:

Instrument	S/N	Calibration date	Valid period (months)	National standard	Cert. Nr. (/14/)	Calibration entity
Flow meter (Used to measure the NO_3^- contained in the aqueous waste)	080306	06/03/2008	24	JJG711-1990	Liaoji 08030608 106	Liaoning Provincial Institute of Measurement
		04/03/2010	24	JJG711-1990	Liaoji 10030402 122	Liaoning Provincial Institute of Measurement
Flow meter (Used to measure the NO_3^- in the by-products, before replacement)	AE0605535	24/12/2008	12	JJG1033-2007	Liaoji 08122402 201	Liaoning Provincial Institute of Measurement
Flow meter (Used to measure the NO_3^- in the by-products, after replacement)	AE0404094	20/11/2009	12	JJG1033-2007	Liaoji 09112002 103	Liaoning Provincial Institute of Measurement
Flow meter (Used to measure the NO_X in the reaction off gases, to DeN_2O reactor)	0054302/4924022	20/01/2009	24	JJG640-1994	Liaoji 09012002 112	Liaoning Provincial Institute of Measurement
Flow meter (Used to measure the NO_X in the reaction off gases, bypass, before replacement)	FE2564	10/03/2008	24	JJG640-1994	Liaoji 08031008 103	Liaoning Provincial Institute of Measurement
Flow meter (Used to measure the NO_X in the reaction off gases, bypass, after replacement)	FE2564A	01/02/2010	24		Liaoji 10020102 104	
Gas analyzer (Used to measure the concentration of NOx)	VD-887(AT-2306)	06/03/2009	12	JJG968-2002; JFZ(JLBZ-C-09)-02-2006	Liaoji 09030606 302	Liaoning Provincial Institute of Measurement
		21/01/2010	12		Liaoji 10030506 602	
Three electronic balances (used to measure the weight of samples in lab measuring HNO_3_physical)	D450000836, D432311092, D432311087	16/02/2009	12	JJG1036-2008	01200900 239; 01200900 241; 01200900 247	Liaoyang Institute of Measurement and Testing

		13/02/2010	12		01201000190; 01201000187; 01201000186	
Two spectrophotometers (Used to measure the concentration of NO_3^-)	A11024531130CS	06/01/2009	12	JJG178-2007	03200900085	Liaoyang Institute of Measurement and Testing
		05/01/2010	12		03201000269	
	A11024130206CS	04/12/2008	12		HX810082	
		03/12/2009	12		03200907245	

3.4.16 Q_N_2Oy: the Quantity of N_2O Produced (t)

The quantity of N_2O produced (Q_N_2Oy) is calculated as the actual emissions rate during this monitoring period times the total amount of adipic acid produced (P_AdOH, discussed in section 3.4.5 above). The formula is:

Q_ N_2Oy = (P_AdOH × N_2O_/AdOH)y

N_2O_/AdOH (kg N_2O/kg adipic acid) is the actual emission rate capped by the emission factor of 0.27 kg N_2O/ kg adipic acid sourced from IPCC Good Practice Guidance as required by AM0021 Version 1. The actual emission rate is calculated as follows:

N_2O_/AdOH = HNO_3_chemical / P_AdOH / 63 /2 × 0.96 ×44

HNO_3_chemical is obtained by the measured nitric acid consumption (HNO_3_consumption, discussed in section 3.4.14 above) deducted the nitric acid physical losses (HNO_3_physical, discussed in section 3.4.15 above) measured in the aqueous waste, the off gases, the adipic acid and the by-product. The formula is:

HNO_3_consumption = HNO_3_chemical + HNO_3_physical

The accumulated values of P_AdOH, HNO_3_consumption and HNO_3_physical in this monitoring period have been verified as presented in section 3.4.5, section 3.4.14 and section 3.4.15 of this report. It was calculated by SGS verification team that the N_2O_/AdOH during this monitoring period was 0.301 kgN_2O/ kg which was consistent with the value reported in appendix 9 of the MR. It was verified that the N_2O_/AdOH in this monitoring period was higher than the capped maximum N_2O emission rate (KE_N_2O). Thus KE_N_2O as 0.27 kg N_2O/kg AdOH was adopted as the N_2O_/AdOH to determine the quantity of N_2O to be credited for this monitoring period as per AM0021 version 1. The monthly reported values of quantity of N_2O actually produced and quantity of N_2O to be credited in appendix 9 of MR were verified to be correct.

3.5 Accuracy of Equipment

Equipments involved in the monitoring procedure have been calibrated as per the registered PDD. It was verified that the accuracy of the equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board and is controlled and calibrated in accordance with the monitoring plan. Detail calibration information for all the monitoring instruments is clear in Section 3.4 of this report.

3.6 Accuracy of Emission Reduction Calculations

The calculation of emission reductions is found to be correct (/28/). No CARs and CLs were raised regarding the accuracy of emission reduction calculations. The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'.

3.7 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the Emission Reductions are discussed in section 3.4 above. All the data recorded is in compliance with the monitoring report.

3.8 Management System and Quality Assurance

CDM activity was managed as per the PDD and QA/QC procedure for each parameter was strictly followed according to the monitoring plan. CDM monitoring manual (/16/) has been established and implemented in daily operation. This has been verified in accordance with the VVM (/27/). Furthermore, the companies involved in the project have quality management system of GB/T 19001-2000 (/32/), environmental management system of GB/T24001-2004 (/33/) and health and safety management system of GB/T 28001-2001 (/34/) implemented. Moreover, the NOx concentration in the effluent gas of the CDM project was monitored constantly by online analyzers and checked by local Environmental Protection Bureau (/25/). Therefore we can affirm that the management system of the CDM project is in place; with the responsibilities properly identified and in place.

3.9 Data from External Sources

The external data for this project are:

(1) NCV_{coal} (heat value per kg standard coal): 29.3 MJ/kg-coal, fixed for the crediting period as per the registered PDD;

(2) $COEF_{Heat}$ (CO_2 emission factor per MJ heat): 0.0983kgCO_2/MJ, fixed for the crediting period as per the registered PDD;

(3) GWP_N_2O: 310 according to AM0021 version 1 dated 25/02/2005.

4. Calculation of Emission Reductions

Parameter	*Reported Value In MR version 1*	*Verified Value*
[1] Q_GE (Nm^3)	60,140,905	60,140,905
[2] N_2O_GE (ppm)	289	289
[3] ND_N_2O (t)	34.142	34.142
[4] %_online (%)	99.44	99.44
[5] P_AdOH (t)	44,792.000	44,792.000
[6] HNO_3_consumption (t)	41,496.483	41,496.483
[7] HNO_3_physical (t)	1,275.478	1,275.478
[8] Actual N_2O_AdOH (kg N_2O/kg AdOH)	0.301	0.301
[9] N_2O_AdOH (kg N_2O/kg AdOH)	0.27	0.27
[10] Q_N_2O (Quantity of N_2O actually produced)(t)	13,483.613	13,483.613
[11] Q_N_2O (Quantity of N_2O to be credited) (t) [5]*[9]	12,093.840	12,093.840
[12] Q_N_2O_bypass (t)	67.501	67.501
[13] Q_N_2O reg (kg/year)	No limit	No limit
[14] N_2O_reg/AdOH (kg/kg)	No limit	No limit
[15] r_y (%)	0	0
[16] P_N_2O ($/t)	0	0
[17] Q_Steam_p (t)	10,712.636	10,712.636
[18] E_steam_p (kg-CO_2/kg-steam)	0.2624	0.2624
[19] Q_power (kWh)	1,577,577	1,577,577
[20] E_power (kg-CO_2/kWh)	1.2561	1.2561

$$\mathbf{ER_y = BE_y - PE_y - L_y}$$

$$= (Q\_N_2O * GWP\_N_2O + Q\_Steam\_p * E\_Steam\_p) - (Q\_N_2O\_bypass + ND\_N_2O) * GWP\_N2O - Q\_power * E\_power$$

$$= (12{,}093.840 * 310 + 10{,}712.636 * 0.2624) - (67.501 + 34.142) * 310 - 1{,}577{,}577 * 1.2561 * 10^{-3}$$

$$= \mathbf{3{,}718{,}409\ tCO2e}$$

5. Recommendations for Changes in the Monitoring Plan

No recommendation for changes in the monitoring plan made during the 10th periodic verification.

6. Overview of Results

Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

Yes. Members of the assessment team visited the sites and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.

The results of the site visits are recorded in the verification checklist which is used as an internal report only.

The evidences have been checked and collected. The revised monitoring report is attached with this verification report.

Has data from additional sources been used? If yes, please detail the source and significance.

Yes, external data for this project are: (1) NCV_{coal} (heat value per kg standard coal): 29.3 MJ/kg-coal, fixed for the crediting period as per PDD; (2) $COEF_{Heat}$ (CO2 emission factor per MJ heat): 0.0983kgCO2/MJ, fixed for the crediting period as per PDD; (3) GWP_N_2O: 310 according to AM0021 version 1 dated 25/02/2005. Only the GWP_N_2O is deemed to be significant to determine the emission reductions achieved by this project.

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

No.

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction was 2,826,781 tCO2 for the period 01/12/2009 to 13/03/2010 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 3,718,409 tCO2 for the same period which was higher than the above mentioned estimate in the registered PDD. It is verified that this is mainly due to the %_on-line, destruction rate and eligible P_AdOH are higher than that set in the registered PDD. Details please refer to Section 3.1 of this report..

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

No such non conformity of the actual project activity and its operation with the registered project design document has been observed.

Post monitoring report on UNFCCC website

Yes, the monitoring report is available at ref. 1238 on UNFCCC website

http://cdm.unfccc.int/Projects/DB/DNV-CUK1184240745.87/iProcess/SGS-UKL1273147233.88/view

7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by PetroChina Company Limited Liaoyang Petrochemical Company to perform the verification of the emission reductions reported for the CDM project 'N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company', UNFCCC Ref. No. 1238 in the period 01/12/2009 to 13/03/2010.

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Monitoring Report version 2 dated 28/05/2010.

The management of the PetroChina Company Limited Liaoyang Petrochemical Company is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report version 2 dated 28/05/2010. Calculation and determination of GHG emission reductions from the project is the responsibility of the management of the 'N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company'. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/12/2009 to13/03/2010 based on the reported emission reductions in the Monitoring Report version 2 dated 28/05/2010 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	N2O decomposition project of PetroChina Company Limited Liaoyang Petrochemical Company
UNFCCC Reference Number:	1238
Registered PDD and Approved Used for Verification:	PDD version 3, dated 06/04/2007
Methodology Used for Verification:	AM0021 version 1, dated 25/02/2005
Applicable Period:	01/12/2009 – 13/03/2010
Total GHG Emission Reductions Verified:	3,718,409 tCO_2e

Signed on behalf of the Verification Body by Authorized Signatory

Signature:

Name: Siddharth Yadav

Date: 22nd July 2010

8. Document References

/1/ http://cdm.unfccc.int/Projects/DB/DNV-CUK1184240745.87/view

/2/ AM0021 version 1 dated 25/02/2005

/3/ Registered PDD version 3 dated 06/04/2007

/4/ Validation report of the project, Report No: 2007-0742, dated 04-07-2007

/5/ Monitoring Report #10 version 1 dated 28/04/2010 and version 2 dated 28/05/2010

/6/ Detailed installation chart of the CDM project

/7/ Inventory of monitoring instruments involved in the CDM project

/8/ Calibration certificates of annubar flow meter, temperature transmitter and pressure transmitter measured Q_GE

/9/ Calibration certificates of online gas chromatograph measured N_2O_GE

/10/ Calibration certificates of automatic quota packaging machines measured P_AdOH

/11/ Calibration certificates of electricity meters measured Q_Power

/12/ Calibration certificates of the flow meter measured Q_Steam_p

/13/ Calibration certificates of flow meters measured HNO_3_consumption

/14/ Calibration certificates of flow meters, gas analyzer, electronic balances and spectrophotometers measured HNO_3_physical

/15/ Accreditation certificates of the calibration entities

/16/ CDM Monitoring Manual

/17/ Interlock settings of the N_2O decomposition facility

/18/ Procedure for maintenance of the connecting valve and bypass valve to the DeN_2O reactor

/19/ Procedure for survey on regulation and restriction on N_2O emissions in China

/20/ DAS/DCS data and historical curve of relevant parameters, in combination with the event log

/21/ Raw records of manual analysis in this monitoring period

/22/ Monthly summarising statistics of all the monitoring parameters in this monitoring period

/23/ Coal consumption rate from Liaoyang Petrochemical Company Thermal Power Plant

/24/ Latest publication of OM and BM data of Northeast China Power Grid by Chinese DNA (http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2413.pdf)

/25/ Environmental Monitoring Reports of NOx concentration in the effluent gas of the CDM project

/26/ Verification and certification reports for the project issued by SGS and monitoring reports for the previous nine monitoring periods

/27/ Validation and Verification Manual version 1.1 dated 04/12/2009

/28/ ERs Spreadsheet for this monitoring period (ERs Calculation#10.xls)

/29/ EB 48 meeting report

/30/ The Statistics of Shutdown of the adipic acid plant in 2004

/31/ Production records of the adipic acid of LYPC in 2004, 2005, 2006, 2007

/32/ Certificate of GB/T 19001-2000 quality management system of PetroChina Company Limited

Liaoyang Petrochemical Company Ltd (Cert. Nr.: 01009Q10049R3L)

/33/ Certificate of GB/T 24001-2004 environmental management system of PetroChina Company Limited Liaoyang Petrochemical Company (Cert. Nr.: 01009E10010R3L)

/34/ Certificate of GB/T 28001-2001 health and safety management system of PetroChina Company Limited Liaoyang Petrochemical Company (Cert. Nr.: 01009S10008R2L)

/35/ Paragraph 64(j), 67(c) of EB 52 meeting report

9. Findings Overview

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	1	0	0

Date:	27/05/2010		Raised by:	Simon Zhao	
Type:	CAR	Number:	CAR #1	Reference:	Section 3 of AU4
Lead Assessor Comment:				**Date:** 27/05/2010	
The reported information of the serial numbers of the annubar flow meters monitoring Q_GE is not complete in version 1 of the monitoring report. Please provide complete information of the serial numbers of the annubar flow meters (including the Pitot Tube and the transmitter) in the monitoring report.					
Project Participant Response:				**Date:** 28/05/2010	
The annubar flow meters monitoring Q_GE in the project activity are unified equipments combined by Pitot Tube and transmitter. The monitoring report version 1 reported the serial numbers of the transmitters, as a response to this CAR, the serial numbers of Pitot Tube have been included into the monitoring report version 2 accordingly, which has been submitted to DOE for verification.					
Documentation Provided as Evidence by Project Participant:					
Monitoring Report #10 version 2					
Information Verified by Lead Assessor:					
Monitoring Report #10 version 2					
Reasoning for not Acceptance or Acceptance and Close Out:					
The calibration information of the annubar flow meters monitoring Q_GE is complete in version 2 of the monitoring report. The flow meters have been calibrated as per the monitoring plan. CAR #1 is closed out.					
Acceptance and Close out by Lead Assessor:				**Date:** 03/06/2010 [Simon Zhao]	

10. Statement of Competence

Statement of Competence

Name: Zhao, Simon SGS Affiliate: SGS China

Status

-	Lead Assessor	x	-	Expert	
-	Assessor	x	-	Financial Expert	
-	Local Assessor	x	-	Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)
Sub scope(s):
2. Energy Distribution
Sub scope(s):
3. Energy Demand
Sub scope(s):
4. Manufacturing
Sub scope(s):
5. Chemical Industry
Sub scope(s):
6. Construction
Sub scope(s):
7. Transport
Sub scope(s):
8. Mining/Mineral Production
Sub scope(s):
9. Metal Production
Sub scope(s):
10. Fugitive Emissions from Fuels (solid, oil and gas)
Sub scope(s):
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride
Sub scope(s):
12. Solvent Use
Sub scope(s):
13. Waste Handling and Disposal
Sub scope(s):
14. Afforestation and Reforestation
Sub scope(s):
15. Agriculture
Sub scope(s):

Approved Member of Staff by: Siddharth Yadav Date: 05/11/2009

Statement of Competence

Name: Liu, Guy SGS Affiliate: SGS China

Status

-	Lead Assessor		-	Expert	x
-	Assessor		-	Financial Expert	
-	Local Assessor	x	-	Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)
Sub scope(s):

2. Energy Distribution
Sub scope(s):

3. Energy Demand
Sub scope(s):

4. Manufacturing
Sub scope(s):

5. Chemical Industry **x**
Sub scope(s): Nitric Acid or Caprolactam Production

6. Construction
Sub scope(s):

7. Transport
Sub scope(s):

8. Mining/Mineral Production
Sub scope(s):

9. Metal Production
Sub scope(s):

10. Fugitive Emissions from Fuels (solid, oil and gas)
Sub scope(s):

11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride
Sub scope(s):

12. Solvent Use
Sub scope(s):

13. Waste Handling and Disposal
Sub scope(s):

14. Afforestation and Reforestation
Sub scope(s):

15. Agriculture
Sub scope(s):

Approved Member of Staff by: Siddharth Yadav Date: 06/04/2010

Statement of Competence

Name: Wu, Michael SGS Affiliate: SGS China

Status

-	Lead Assessor	x	-	Expert	x
-	Assessor	x	-	Financial Expert	
-	Local Assessor	x	-	Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)
Sub scope(s):

2. Energy Distribution
Sub scope(s):

3. Energy Demand
Sub scope(s):

4. Manufacturing
Sub scope(s):

5. Chemical Industry **x**
Sub scope(s): Adipic acid production, Nitric Acid or Caprolactam Production

6. Construction
Sub scope(s):

7. Transport
Sub scope(s):

8. Mining/Mineral Production
Sub scope(s):

9. Metal Production
Sub scope(s):

10. Fugitive Emissions from Fuels (solid, oil and gas)
Sub scope(s):

11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride
Sub scope(s):

12. Solvent Use
Sub scope(s):

13. Waste Handling and Disposal
Sub scope(s):

14. Afforestation and Reforestation
Sub scope(s):

15. Agriculture
Sub scope(s):

Approved Member of Staff by: Siddharth Yadav Date: 04/11/2009

11. Photographic Evidence

Unique reference number: 4989886/0068713
Parameter: Q_GE
Name of equipment: Annubar flow meter
Date: 24/04/2010

Unique reference number: 4924020/0054303
Parameter: Q_GE
Name of equipment: Annubar flow meter
Date: 25/05/2010

Unique reference number: 0606/b842589937
Parameter: Q_GE
Name of equipment: Temperature transmitter
Date: 24/04/2010

Unique reference number: b427668837 Parameter: Q_GE

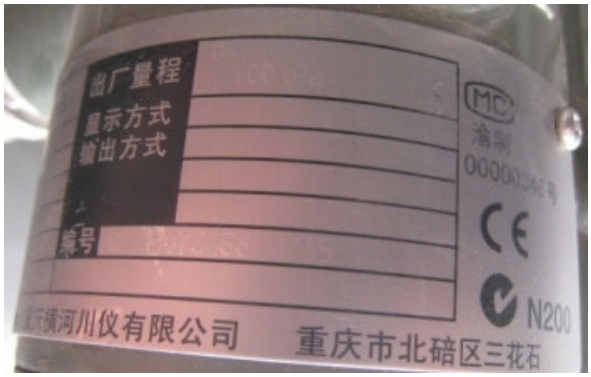
Name of equipment: Temperature transmitter Date: 25/05/2010

Unique reference number: CF610UR252135 Parameter: Q_GE

Name of equipment: Pressure transmitter Date: 24/04/2010

Unique reference number: CzzB075453 Parameter: Q_GE

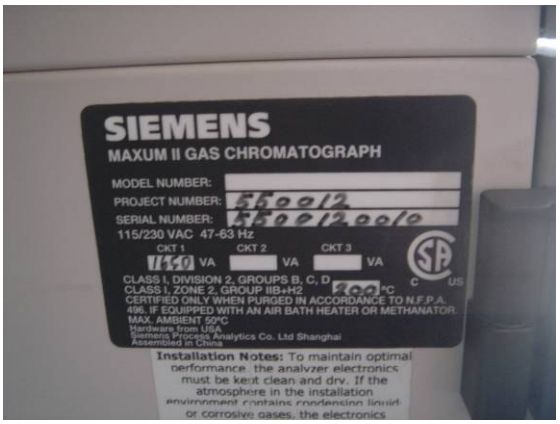
Name of equipment: Pressure transmitter Date: 25/05/2010



Unique reference number: 5500120010 (AT-2307) Parameter: N_2O_GE

Name of equipment: Online gas chromatograph

Date: 24/04/2010

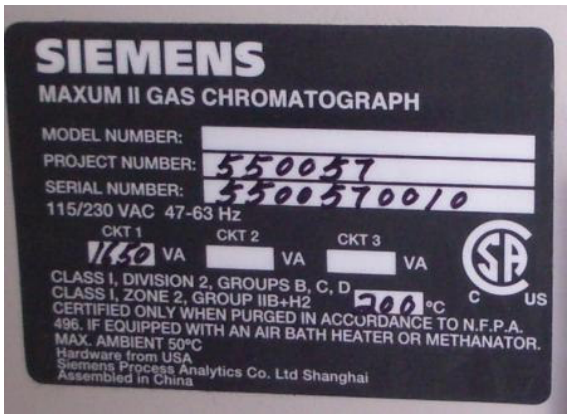


Unique reference number: 5500570010 (AT-2307)

Parameter: N_2O_GE

Name of equipment: Online gas chromatograph

Date: 25/05/2010



Unique reference number: 04042001-U

Parameter: P_AdOH

Name of equipment: Automatic quota packaging machine

Date: 25/05/2010

Unique reference number: 04042002-U

Parameter: P_AdOH

Name of equipment: Automatic quota packaging machine

Date: 25/05/2010

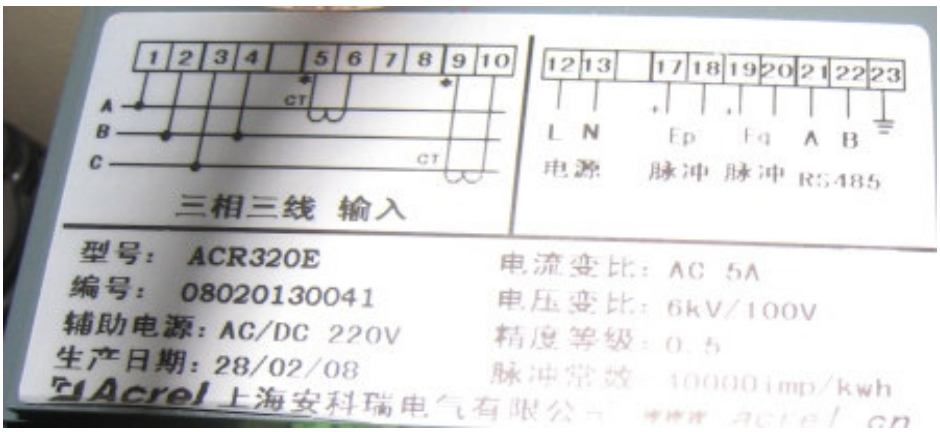
Unique reference number: U84Z404A
Parameter: P_AdOH
Name of equipment: Automatic quota packaging machine
Date: 25/05/2010

Unique reference number: U84Z404B
Parameter: P_AdOH
Name of equipment: Automatic quota packaging machine
Date: 25/05/2010

Unique reference number: 08010050001
Parameter: Q_Power
Name of equipment: Electricity meter
Date: 25/05/2010

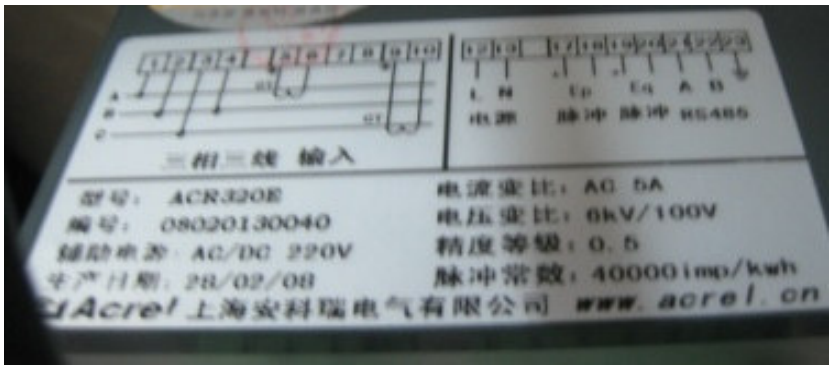
Unique reference number: 08020130041 Parameter: Q_Power

Name of equipment: Electricity meter Date: 25/05/2010



Unique reference number: 08020130040 Parameter: Q_Power

Name of equipment: Electricity meter Date: 25/05/2010



Unique reference number: HVS71025 Parameter: Q_Steam

Name of equipment: Steam meter Date: 25/05/2010

Unique reference number: 413105/3032717
Name of equipment: Flow meter

Parameter: HNO_3_consumption
Date: 24/04/2010

Unique reference number: 413106/3032737
Name of equipment: Flow meter

Parameter: HNO_3_consumption
Date: 25/05/2010

Unique reference number: C40E4C02000

Parameter: HNO_3_consumption

Name of equipment: Flow meter

Date: 25/05/2010

Unique reference number: 080306

Parameter: HNO_3_physical

Name of equipment: Flow meter

Date: 25/05/2010

Unique reference number: AE0605535

Parameter: HNO_3_physical

Name of equipment: Flow meter

Date: 24/04/2010

Unique reference number: AE0404094

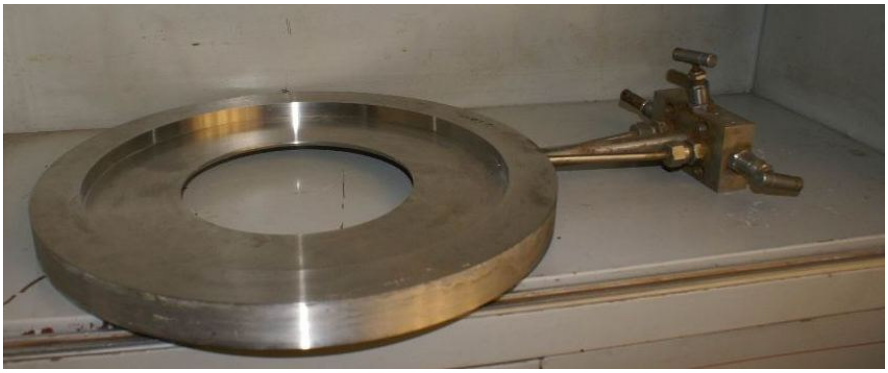
Parameter: HNO_3_physical

Name of equipment: Flow meter

Date: 25/05/2010

Unique reference number: 0054302/4924022
Parameter: HNO_3_physical
Name of equipment: Flow meter
Date: 24/04/2010

Unique reference number: FE2564
Parameter: HNO_3_physical
Name of equipment: Flow meter
Date: 24/04/2010



Unique reference number: FE2564A
Parameter: HNO_3_physical
Name of equipment: Flow meter
Date: 25/05/2010

Unique reference number: VD-887(AT-2306)
Name of equipment: Gas analyzer

Parameter: HNO_3_physical
Date: 25/05/2010

Unique reference number: D450000836
Name of equipment: Electronic balance

Parameter: HNO_3_physical
Date: 24/04/2010

Unique reference number: D432311092
Name of equipment: Electronic balance

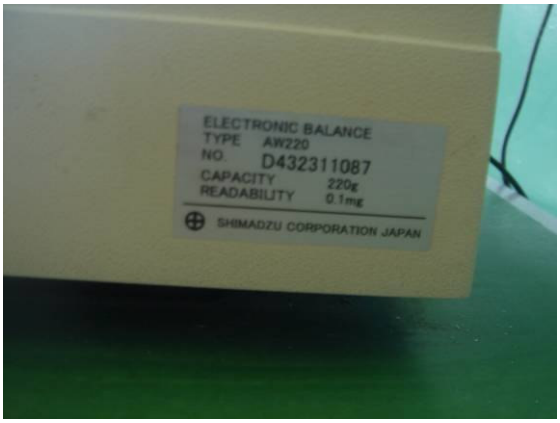
Parameter: HNO_3_physical
Date: 24/04/2010

Unique reference number: D432311087

Parameter: HNO_3_physical

Name of equipment: Electronic balance

Date: 24/04/2010



Unique reference number: A11024531130CS

Parameter: HNO_3_physical

Name of equipment: Spectrophotometer

Date: 24/04/2010

Unique reference number: A11024130206CS

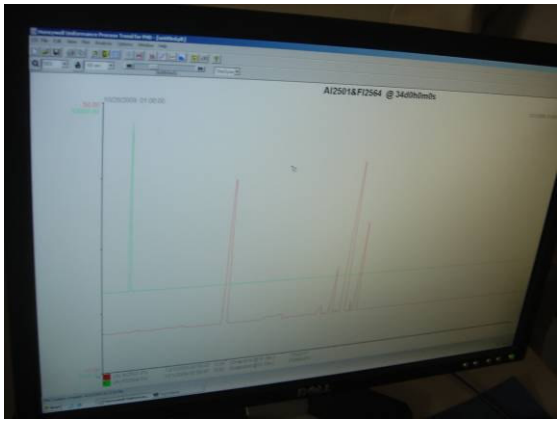
Parameter: HNO_3_physical

Name of equipment: Spectrophotometer

Date: 24/04/2010

Name of equipment: DAS

Date: 24/04/2010



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