



VERIFICATION AND CERTIFICATION REPORT

- 2ND PERIODIC –

RASHTRIYA CHEMICALS AND
FERTILIZERS LIMITED

N₂O ABATEMENT IN HP NITRIC ACID PLANTS AT RASHTRIYA
CHEMICALS & FERTILIZERS LIMITED, INDIA

UNFCCC REF. No. : 2792

Monitoring Period: 2010-02-13 to 2010-07-07
(incl. both days)

Report No: 8106754168 – 10/447

Date: 2013-07-03

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-2139
www.tuev-nord.de
www.global-warming.de

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Project:	Title:	Registration date:	UNFCCC-No.:	
	N ₂ O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India	2009-11-20	2792	
	Crediting period:	From:	To:	
	<input checked="" type="checkbox"/> Renewable (7y) <input type="checkbox"/> Fixed (10y)	2009-11-20	2016-11-19	
	Project Scale:			
	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale			
Project Participant(s):	Client:			
	Rashtriya Chemicals and Fertilizers Limited			
	Non Annex 1 country:	Annex 1 country:		
	India	Switzerland		
	PP from non Annex 1 country:	PP from Annex 1 country:		
	Rashtriya Chemicals and Fertilizers Limited	Rashtriya Chemicals and Fertilizers Limited		
Applied methodology/ies:	Title:	No.:	Scope(s) / TA(s)	
	Catalytic reduction of N ₂ O inside the ammonia burner of nitric acid plants	AM0034, Version 3.2	05/5.1	
Monitoring period and monitoring report	Monitoring period (MP):		Monitoring Report:	
	From:	To:	No. of days:	Draft version:
	2010-02-13	2010-07-07	145	Version 1: dated 2010-09-28
				Final version:
				Version 4; 2013-02-08
Verification team / Technical Review and Final Approval:	Verification Team:		Technical review:	Final approval:
	Mr. Rainer Winter (TL/TE) Mr. Mohinder Amarnath (TM) Mr. Jimmy Sah (TM) Mr. Prasad Jakkaraju (TM) (till 17-02-2013)		Mr. Ulrich Walter Mr. Speyer Dirk	Mr. Dr. Jochen Schubert
Key dates of verification:	Publication of MR :	DVerR issued:	On-site (from):	On-site (to):
	2010-10-12	2011-01-17	2010-12-13	2010-12-15
Summary of Verification opinion	<p>Rashtriya Chemicals and Fertilizers Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: "N₂O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India", with regard to the relevant requirements for CDM project activities.</p> <p>As a result of this verification, the verifier confirms that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> all operations of the project are implemented and installed as planned and described in the validated project design document, <input checked="" type="checkbox"/> the monitoring plan is in accordance with the applied approved CDM methodology, <input checked="" type="checkbox"/> the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately, in case of delay the procedure as per VVS version 3.0 Para 238 (a) has been followed appropriately. <input checked="" type="checkbox"/> the monitoring system is in place and functional. The project has generated GHG emission reductions, and <input checked="" type="checkbox"/> the GHG emission reductions are calculated without material misstatements in 			



	a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as listed below (verified amount).		
Emission reductions: [t CO _{2e}]	Total verified amount	As per draft MR:	As per PDD:
	127,876	130,778	447,305 tCO ₂ /a
		ER achieved up to 2012-12-31	ER achieved from 2013-01-01
		127,876	NA
Document information:	Filename:		No. of pages:
	S01-VA050-F01_VVS.doc		121

Abbreviations:

AFR	Ammonia Gas Flow Rate to AOR
AIFR	Ammonia to Air Ratio
AOR	Ammonia Oxidation Reactor
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CEM	Continuous Emission Monitoring
CO₂	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CL	Clarification Request
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
NAP	Nitric Acid Production
NH₃	Ammonia
N₂O	Nitrous Oxide
OH	Operating Hours
OP	Operating Pressure
OT	Operating Temperature
PDD	Project Design Document
PP	Project Participant
RCF	Rashtriya Chemicals and Fertilizers Limited
TSG	Temperature of Stack Gas
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VSG	Volume flow rate of the Stack Gas
XLS	Emission Reduction Calculation Spread Sheet

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1. INTRODUCTION

Rashtriya Chemicals and Fertilizers Limited has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 2nd periodic verification of the project

“N₂O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India”

with regard to the relevant requirements for CDM project activities. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered CDM project.

GHG data for the monitoring period was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Standard ^{/VVS/} of the UNFCCC.

This report summarizes the findings and conclusions of this 2nd periodic verification of the above mentioned UNFCCC registered project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- implementation and operation of the project activity as given in the PDD,
- compliance with applied approved methodology and the provisions of the monitoring plan,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- accuracy of the monitoring equipment,
- quality of evidence,
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the validated project design document ^{/PDD/}, the monitoring report ^{/MR/}, emission reduction calculation spread sheet ^{/XLS/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 12 of the Kyoto Protocol ^{/KP/},



-
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 ^{/MA/}, and subsequent decisions made by the Executive Board and COP/MOP,
 - other relevant rules, including the host country legislation,
 - CDM Validation and Verification Standard ^{/VVS/},
 - monitoring plan as given in the registered PDD ^{/PDD/},
 - Approved CDM Methodology.

2. GHG PROJECT DESCRIPTION

2.1. Technical Project Description

The project activity entails installation of a secondary catalyst in the ammonia reactor at the High Pressure unit of nitric acid production unit of Rashtriya Chemicals and Fertilizers (RCF) plant.

Nitric Acid (HNO₃) is produced through the oxidation of ammonia (NH₃) on precious metal catalyst gauze in the ammonia burner of a nitric acid plant. Nitrous Oxide (N₂O) is an undesirable by-product gas produced in the manufacture of nitric acid. Waste N₂O from nitric acid production is typically released into the atmosphere as it does not have any economic value at emission levels typical of nitric acid manufacture. RCF uses secondary catalyst in the ammonia burner of nitric acid unit after primary catalyst; this leads to conversion of N₂O to N₂ before its release into the atmosphere. Thus leading to reduction in emission of the N₂O a potent GHG in to the atmosphere.

The key parameters monitored for the project are given in table section 4 of table 2. Annex 1

The key parameters of the project are given in Table 2-1:

Table 2-1: Technical data of the project activity

Parameter	Unit	Value	
		Historical as in PDD	Design Value
Capacity of the plant	TPA	128,480	128,480
Operating temperature	°C	863 – 900	860 – 930
Operating Pressure	barg	6.60 – 6.26	7.65
Max Ammonia Flow	kg/h	5113	6076
Max. Ammonia to Air Ratio	-	11.9	11.5
Operating hours	hrs	2861	-

2.2. Project Location

The details of the project location are given in Table 2-2:

Table 2-2: Project Location

No.	Project Location
Host Country	India
Region:	Mumbai

Project location address:	"Priyadarshini" Building Eastern Express Highway Sion.
Latitude:	18° 56' 33" N
Longitude:	72° 50' 9" E

2.3. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-3.

Table 2-3: Status of previous Monitoring Periods

#	Item	Time	Status
1	Date of registration	2009-11-20	-
2	Start of crediting period	2009-11-20	Registered
3	1 st Monitoring period	2009-11-20 to 2010-02-12	Issued
4	Request for deviation from the monitoring plan	2011-11-08	Approved
5	Request for for approval of changes to the CDM project activity for permanent change in Monitoring plan	2012-11-15	Approved
6	2 nd Monitoring period	2010-02-13 to 2010-07-07	Ongoing

An overview of all Post Registration Changes is given in the following table.

Table 2-3: Overview Post Registration Changes

#	Applicable from – to / as of	MP	Type of post registration change ¹⁾	Description	Status ²⁾ / Date
1	2009-11-20 to 2010-07-07	01, 02	TDfrMP	Request for deviation from the monitoring plan	Approved / 2011-11-08
2	20xx-xx-xx to 20xx-xx-xx	NA	TDfMM	NA	
3	20xx-xx-xx	NA	CrPDD	NA	
4	2010-07-08 onwards	3 rd onwards	PCfrMP	Request for for approval of changes to the CDM project activity for permanent change in Monitoring plan	Approved/ 2012-11-15
5	20xx-xx-xx		PCfMM	NA	
6	20xx-xx-xx	NA	CoPD	NA	

- 1) TDfrMP : Temporary deviation from registered monitoring plan
- TDfMM : Temporary deviation from the monitoring methodology
- CrPDD : Corrections to the registered PDD
- PCfrMP : Permanent changes from registered Monitoring Plan
- PCfMM : Permanent changes from Monitoring Methodology
- CoPD : Changes to the project design of a registered project activity
- 2) Approval (by EB) or Acceptance (by DOE)

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- A desk review of the Monitoring Report^{/MR/} submitted by the client and additional supporting documents with the use of customised verification protocol^{/CPM/} according to the Validation and Verification Standard^{/VVS/},
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consisting of one team leader and 3 additional team members, was appointed.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the Table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme competence ³⁾	Technical competence ⁴⁾	Verification competence ⁵⁾	Host country Competence	On-site visit
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Rainer Winter	TN CERT	TL/TE _{A)}	SA	<input checked="" type="checkbox"/>	5.1/ Q	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Prasad Jakkaraju*	TUV India Pvt. Ltd.	TM ^{A)}	LA	<input checked="" type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Mohinder Amarnath	TUV India Pvt. Ltd.	TM ^{A)}	LA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Jimmy Sah	TUV India Pvt. Ltd.	TM ^{A)}	LA	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Ulrich Walter	TN CERT	TR ^{B)}	LA	<input checked="" type="checkbox"/>	5.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Dirk Speyer	TN CERT	TR ^{B)}	LA	<input checked="" type="checkbox"/>	5.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Dr. Jochen Schubert	TN CERT	FA ^{B)}	SA	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹⁾ TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

²⁾ GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

³⁾ GHG auditor status (at least Assessor)

⁴⁾ As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

⁵⁾ In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

* Team Member till 17-05-2013

All team members contributed to the review of documents, the assessment of the project activity and to the preparation of this report under the leadership of the team leader.

Technical experts contributed to the assessment of special aspects of the project activity, e.g. technical or host country aspects.

In order to qualify further personnel the project team was accompanied by observers and/or trainees as indicated in the table above. They are usually not considered as team members.

Statements of competence for the above mentioned team members are enclosed in annex 2 of this report.

3.4. Publication of the Monitoring Report

In accordance with the CDM M&P (§ 62) the draft monitoring report, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the verification activity commenced. Comments received are taken into account in the course of the verification, if applicable.

3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in Table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
<i>The following potential risks were identified and divided and structured according to the possible areas of occurrence.</i>	<i>The potential risks of raw data generation have been identified in the course of the monitoring system implementation. The following measures were taken in order to minimize the corresponding</i>	<i>Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in</i>	<i>The additional verification testing performed is described. Testing may include:</i> <ul style="list-style-type: none"> - Sample cross checking of manual transfers of data - Recalculation - Spreadsheet 'walk throughs' to check 	<i>Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.</i>

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
	risks. The following measures are implemented:	the course of every verification.	links and equations - Inspection of calibration and maintenance records for key equipment - Check sampling analysis results Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.	

The completed table A-1 is enclosed in Annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in Table 3-3.

Table 3-3: Table A-2; Structure of the project specific periodic verification checklist

Table A-2: Periodic verification checklist				
Checklist Item	Reference	Verification Team Comments	Draft Conclusion	Final Conclusion
<i>The checklist items in Table A-2 are linked to the various requirements the monitoring of the project should meet. The checklist is organised in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.</i>	<i>Gives reference to the information source on which the assessment is based on.</i>	<i>The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the VVS shall be covered in this section.</i>	<i>Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft verification stage.</i>	<i>In case of a corrective action or a clarification the final assessment at the final verification stage is given.</i>

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in Annex 1 (table A-2) to this report.

3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan^{/PDD/},
- the last revision of the validation report^{/VAL/},
- documentation of previous verifications^{/VER/}
- the monitoring report, including the claimed emission reductions for the project^{/MR/},
- the emission reduction calculation spreadsheet^{/XLS/}.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The monitoring data were checked completely.
- An assessment of the implementation and operation of the registered project activity as per the registered PDD or any approved revised PDD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;
- A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and corresponding tool(s), where applicable;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.
-

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of Rashtriya Chemicals and Fertilizers Limited including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel 2. List of personnel interviewed is described under section 7.4	<ul style="list-style-type: none"> - General aspects of the project - Technical equipment and operation - Changes since validation / previous verification - Monitoring and measurement equipment - Remaining issues from validation/ previous verification - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan

Interviewed Persons / Entities	Interview topics
	<ul style="list-style-type: none">- Monitoring data management- Data uncertainty and residual risks- GHG emission reduction calculation- Procedural aspects of the verification- Maintenance- Environmental aspects

The list of interviewees is included in chapter 7.4.

3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.9. Resolution of CARs, CLs and FARs

Nonconformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation or previous verifications requiring actions by the project participants to be verified during verification have not been resolved.

The verification team uses the term Clarification Request (CL), which is issued if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

3.10. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.11. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.12. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report^{/MR/}, the calculation spreadsheet^{/XLS/}, PDD^{/PDD/}, the Validation Report^{/VAL/} and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CL and FAR

Verification topic	No. of CAR	No. of CL	No. of FAR
A – Description of project activity	03	0	0
B – Implementation of project activity	04	0	0
C – Description of monitoring system	02	0	0
D – Data and parameters	06	0	0
E - Calculation of Emission Reductions	03	0	0
SUM	18	0	0

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Table 4-2: MR versions used for assessments

Version Nr.	Assessment Round
MR v. 1 (Published)	Initial finding raised
MR v. 2	DOE Assessment #1 (CAR D6 is raised)
MR v. 3	DOE final Assessment
MR v. 4	In VVS format

Finding:	CAR A1
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The following mistakes/inconsistencies have been identified in the MR;</p> <ul style="list-style-type: none"> • The date of installation of the catalyst is wrongly mentioned on page 1 of the MR, • Chapter 1 in section C is repeated twice. • There is no operating hour meter as mentioned under page 8, • Appendix II is not included as mentioned in the MR. • Page 24: the EF2 value is given wrongly. • QA/QC section for GS_{project} does not detail the procedures for the QA/QC for the Gauze suppliers for the project. • Page 24 mentions the current campaign to be the first campaign; however the same is not correct. • The units used for OP should indicate the reference point (absolute/gauge). • In section B.3 of MR the statement regarding the effect of the request for deviation needs to be revised.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>Monitoring report has been revised for following correction:</p> <ul style="list-style-type: none"> • Date of catalyst installation has been corrected on page no. 1 of MR. • Numbering system of chapter 1 in section C of monitoring report has been corrected. • “Operating hour meter” is replaced with “Operating hour counter” on page no. 8 of MR. • Appendix II is included and references in the monitoring report are corrected accordingly. • Page 24 of MR: the EF2 value has been corrected. • QA/QC Section for GS_{Project} has been corrected suitably. • On Page 25 of MR, appropriate correction has been done. • The unit used for OP now indicate reference point (absolute/gauge) in the revised monitoring report. • Section B.3 of MR has been revised.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The revised Monitoring report has been checked to confirm the following;</p> <ul style="list-style-type: none"> • Date of catalyst installation has been corrected on page no. 1 of MR to confirm the . • Numbering system of chapter 1 in section C of monitoring report has been corrected to be consistent. • “Operating hour meter” is replaced with “Operating hour counter” on page no. 8 of MR. • Appendix II is included and references in the monitoring report are consistent with the same.

Finding:	CAR A1
	<ul style="list-style-type: none"> Page 24 of MR: the EF2 value has been corrected considering the monitoring period as 2nd campaign. QA/QC Section for GS_{Project} has been corrected suitably. On Page 25 of MR, appropriate correction has been done. The unit used for OP now indicate reference point (absolute/gauge) in the revised monitoring report. Section B.3 of MR has been revised to provide the details for the request for deviation approved for the project. <p>CAR is closed.</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR A2
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The instrument classes / accuracies are not included in Appendix 1 as mentioned in the parameter tables.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Instrument accuracies are included in the Appendix III of revised MR.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR, provides the accuracies of the instruments under Appendix III. The accuracy values have been confirmed with the calibration reports and found correct. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR A3
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	During the course of Verification progress, the MR template is no longer valid. Thus appropriate corrections are required.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The revised MR version 04, follows the VVS template and the same is the latest available.

Finding:	CAR A3
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The MR version 4 confirms to the latest template 3.1 available and confirms to VVS requirement. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR B1
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	In annexure 1 the end of the campaign is stated as 07.07.2010 00:00, whereas during verification it was found out to be 07.07.2010 24:00.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The end date of the campaign has been corrected in Appendix II of revised monitoring report.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR provides the correct timings (07.07.2010 24:00 end of campaign). CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR B2
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	During the verification site visit it was found that the backup hard disk connected to CEM system is currently not in operation. This is not in line with registered monitoring plan (refer page 44 of the PDD).
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The action for replacement of backup hard disk has already been initiated and it is expected that job shall be completed shortly. Further we would like to submit that non availability of the back up hard disk was not affecting the performance of the CEM system as the back-up data was available in the data logger and CEM system

Finding:	CAR B2
	computer hard-disk. The hard disk was replaced with new one and made functional on 27.05.2011.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The hard disk has been replaced, and the data for the complete period is available in the data logger. However the hard disk is replaced as an emergency procedure for data storage. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR B3		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The EN14181 requirements for QAL 3 are not fully implemented. In this context it shall be referred to the recommendations given under the AST report.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	OEM has fully implemented the requirement of QAL3 as per EN14181; however some diagnostic functions referred in the recommendations of AST report were not activated. These features were activated subsequently with the help of OEM.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The recommendations have been implemented and the same has been confirmed from the AST report for 2012. The recommendations during the Annual Surveillance Test conducted in March 2011 by SGS, includes a change in the equation for NCSG. SGS has recommended that measuring inaccuracy constants for parameter of NCSG which is 62 should not be subtracted and the value of this constant should be made zero in the system. Accordingly, to comply with the recommendation of SGS, all NCSG readings during the Monitoring period are added with 62 and further used in for CER calculations. Though the correction is observed in March 2011 however it has been applied as conservative measure retrospectively. The emission reduction calculation has been revised and is conservative; the same is checked and is acceptable. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding:	CAR B4		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The exclusion of values during plant downtimes/start-ups has not been done consistently. The base data needs to be updated accordingly.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The exclusion of values pertaining to plant shutdown/start-ups has now been done consistently. All the data where the operating hour is zero are not considered for CER calculation. The "Base data" work sheet in revised CER calculations has been corrected suitably.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The data has been made consistent. The values for the parameters during downtimes and times when the OH is zero has been deleted and not considered for further calculation of ER. The same is inline with the AM0034 requirements and is acceptable. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding:	CAR C1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The review of the calibration details indicate that accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated, thus the appropriateness of the calibration certificate is questionable. Further the implications of this fact need to be evaluated considering the requirements under EB 52 annex 60 (also according EB 70 annex 3 para 238 (a)).		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>The action for procuring new master instruments with accuracies better than the accuracies of instruments being calibrated was initiated. The new master instruments with better accuracy were received in April 2011 and the instrument calibration is being performed with the new master instruments since then.</p> <p>In line with Audit observations related to Master instrument accuracies during subsequent Verification audit, CER calculations have been done considering extreme negative error in all the measuring instrument accuracies which is a conservative measure.</p> <p>Compliance with EB-70 Annex 03 para 238 (a) due to delay in calibration of stack pressure transmitter is also addressed in above considerations</p>		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-</i>	<p>The revised MR provides the details for the calibration covering the entire monitoring period.</p> <p>The accuracies of the new master equipment are better than the</p>		

Finding:	CAR C1
2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	<p>equipment being calibrated.</p> <p>However for the current monitoring period the inaccuracies for each instrument listed above have been considered and a combined inaccuracy for the parameter has been established. The theoretical maximum error possible has been applied considering the error of the master calibrator and each equipment. Further in case multiple equipment applicable for a parameter the combine inaccuracy of the instruments has been applied. The combined inaccuracy for the parameter has been established on basis as the root of sum of squares of inaccuracies for each parameter.</p> <p>It was observed that the parameters under question do not have any direct impact on the emission reductions. However, and indirect marginal impact is recorded due to change in the range of values affected. In line with the conservative approach the combined negative error for each of the parameter has been established and applied. This leads to a reduction of CERs. The approach takes into account the maximum error possible, thus is assessed to be conservative and appropriate.</p> <p>Moreover, the calibrations with the new master equipments were conducted and no errors have been reported, However, the emission reductions have been calculated after application of maximum error for the parameters in question. The same is assessed to be in-line with the procedures as per EB 70 annex 3 para 238 (a).</p>
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR C2
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>During the verification activity, it is observed that;</p> <ul style="list-style-type: none"> AST has not been conducted for 2009 further the implications for the same are missing Recommendations of AST 2011 considering revision of constants has not been detailed
Corrective Action #1 <i>This section shall be filled by</i>	The replies are as follows;

Finding:	CAR C2
<p><i>the PP. It shall address the corrective action taken in details.</i></p>	<p>AST for 2010 has been conducted on 4th March and 5th March and the results are in compliance thus the uncertainty as measured in QAL 2 (2008) has been applied leading to conservative estimation of emission reductions and the same is in compliance to EB 70 annex 3 para 238 (a).</p> <p>SGS has recommended that measuring inaccuracy constants for parameter of NCSG which is 62 should not be subtracted and the value of this constant should be made zero in the system. Accordingly, to comply with the recommendation of SGS, all NCSG readings during the Monitoring period are added with 62 and further used in for CER calculations. Though the correction is observed in March 2011 however it has been applied as conservative measure retrospectively.</p>
<p>DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>The recommendations during the Annual_Surveillance Test conducted in March 2011 by SGS, includes a change in the equation for NCSG. The revised constants have been applied for emission reduction calculation leading to conservative estimations. The emission reduction calculation has been checked to confirm the same.</p> <p>Further It was observed that AST for year 2009 was not carried out, thus the AST report of 2010 was checked to confirm the functioning of the CEM system. The AST of 2010 confirms the CEM system to be in line with the QAL2 report, thus in line with EB 70 annex 03 para 238 (a) the error in the monitoring for VSG and NCSG have been applied for emission reduction calculations. The error factor of 2.93% for VSG and 3.44% for NCSG has been applied; the values have been cross-checked with the QAL 2 report and is acceptable. Further the application of the error factor leads to a reduction of approximately 1,755 CERs. Thus the project is assessed to be in compliance to the methodology and EB 70 annex 3 para 238 (a).</p> <p>Thus CAR is closed.</p>
<p>Conclusion <i>Tick the appropriate checkbox</i></p>	<p> <input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed </p>

Finding:	CAR D1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR

Finding:	CAR D1
<p>Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i></p>	<p>A. The instrument accuracies for the following parameters have found to be incorrect:</p> <ul style="list-style-type: none"> - OPh - AFR - VSG. <p>B. The instrument accuracy for the parameter NAP is stated as 0.1% however this value reflects the accuracy of mass flow measurement only as per manufacturer's specification. The NAP value is calculated based on the mass flow and the acid concentration both, appropriate corrections are required.</p> <p>C. The given accuracy for the parameter NCSG is not in accordance with the QAL 2 report</p> <p>D. In addition to this additional information regarding the determination of the parameter OH is to be included in the MR (in this context the statements made under B.3. should be considered).</p>
<p>Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>A. Instrument accuracy of following Instruments are corrected in revised monitoring report.</p> <ul style="list-style-type: none"> - OP_h - AFR - VSG. <p>B. The instrument accuracy of Mass flow measurement of dilute Nitric acid is $\pm 0.1\%$ of rate.</p> <p>The NAP value is calculated based on the mass flow of dilute Nitric acid and the acid concentration. The Concentration of Nitric acid is determined by using Hydrometer and Thermometer.</p> <p>Revised monitoring report indicates the same.</p> <p>C. We would like to clarify that the repeatability for the parameter NCSG instrument is $\leq 0.5\%$ of span as per the OEM specifications whereas the QAL2 report indicates the value for uncertainty of the NCSG instrument which is 2.93%.</p> <p>D. Additional information regarding Description of measurement methods and the procedure being followed for determination of parameter OH is included in the revised MR.</p>
<p>DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.)</i></p>	<p>The MR has been revised considering the following,</p> <p>A. Instrument accuracy of following Instruments are corrected in revised monitoring report and have been confirmed with the respective calibration reports.</p>

Finding:	CAR D1
shall be added.	<p>B. The instrument accuracy of Mass flow measurement of dilute Nitric acid is $\pm 0.1\%$ of rate and has been revised to be consistent in the revised MR.</p> <p>C. The repeatability for the parameter NCSG instrument is $\leq 0.5\%$ of span as per the OEM specifications.</p> <p>D. The description of measurement methods and the procedure being followed for determination of parameter OH is included in the revised MR.</p> <p>CAR is closed.</p>
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR D2
Classification	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
Description of finding Describe the finding in unambiguous style; address the context (e.g. section)	<p>Delay in calibration for the parameters of Stack flow (VSG), Stack pressure (PSG) and Stack temperature (TSG) has been observed. The compliance to EB 52 annex 60 (also according EB 70 annex 3 para 238 (a)) has not been demonstrated.</p> <p>Further calibration details under appendix 1 for NCSG does not cover the entire monitoring period, appropriate correction is required.</p>
Corrective Action #1 This section shall be filled by the PP. It shall address the corrective action taken in details.	<p>Two days delay in calibration was due to shutdown preparation jobs. Compliance of EB 52 annex 60 has now been done in CER calculation. Accordingly MR has been revised.</p> <p>The calibration details for NCSG covering the entire monitoring period are indicated in Appendix III of revised monitoring report.</p>
DOE Assessment #1 The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	<p>The revised MR provides the details for the calibration covering the entire monitoring period.</p> <p>The delay in calibration has been addressed in line with the requirements under EB 70 annex 3 para 238 (a) (and according EB 52 annex 60). The emission reduction calculations are checked and found traceable in the emission reduction calculation sheet "combined accuracies". The Verifier confirms that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration results in fewer claimed emission reductions;</p>

	Thus CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

Finding:	CAR D3		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The substitute value strategy for VSG is not in line with AM0034. The highest value within the campaign is not considered as per the methodology. Furthermore the corresponding descriptions in the MR are incorrect.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Substitute value strategy for VSG has been modified as per the requirement of AM0034 and the corresponding description in the monitoring report is revised. Further the excel sheet for CER calculation has been corrected accordingly.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR, has applied the substitute value strategy for VSG in-line with AM0034, i.e. the highest value of the campaign has been used. The excel sheet for CER calculation has been checked to confirm the same. Within the campaign the data for 2010-05-24 has been updated accordingly. The MR has been revised correctly. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding:	CAR D4		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The operating hour calculation as described in the PDD is based on the temperature limits of the reactor, however during the site visit it was observed that the operating hours as calculated in the plant are based on the ammonia flow to the reactor.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The operating hour calculation is normally done by using either of following two methods: 1. Based on the temperature limits of the Reactor as described in the PDD. 2. Based on the ammonia flow to the reactor. Both the methods are equally good to record operating hours of the plant. As per the registered PDD, OH is required to be monitored based		

Finding:	CAR D4
	<p>on temperature limits of the reactor. However, for the period between 20/11/2009 to 09/07/2010, the operating hours were calculated based on the ammonia flow to the reactor.</p> <p>RCF however have switched to the temperature limit of Reactor for monitoring of Operating Hours since 09.07.2010, which is in line with the registered PDD.</p> <p>The request for Deviation was submitted to UNFCCC for their approval. The UNFCCC reference for the deviation is DEV-0395. UNFCCC approved the deviation request on 08.11.2011 for 1st and 2nd Monitoring Periods provided that a revision of Monitoring Plan is requested to be consistent with the implemented procedure in the baseline campaign where operating hours were also determined as per the ammonia flow. The request for revision in the Monitoring plan was submitted to UNFCCC and has been approved on 15th November 2012.</p>
<p>DOE Assessment #1</p> <p><i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>The revision in Monitoring plan has been submitted in-line with the decision from CDM-EB, however for the current monitoring period the OH was monitored based on the flow limit of the reactor which is the approach followed in the baseline scenario also. Thus the approach is assessed to be correct and in line with the decision from CDMEB.</p> <p>According to the decision taken by CDM-EB (http://cdm.unfccc.int/Projects/deviations/38618) "For the deviation to the monitoring and reporting process for the project campaigns included in the 1st monitoring period (20 November 2009 to 12 February 2010) and 2nd monitoring periods (13 February 2010 - 07 July 2010) ,provided that a revision of monitoring plan is requested in order to continue applying the procedure of monitoring the operating hours based on the ammonia flow to be consistent with the implemented procedure in the baseline campaign where operating hours were also determined as per the ammonia flow. The deviation regarding the baseline campaign is accepted for the deviation period requested until the revision of the monitoring plan is approved, provided that the operating hours are monitored based on the flow of ammonia during the deviation period". Hence, CAR is closed.</p>
<p>Conclusion</p> <p><i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the next periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding:	CAR D5		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The daily average value calculations for HNO ₃ concentrations in the original file (HP conc. Data) are not correct as the zero values in the file lead to wrong average values calculated.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Daily average value calculation for HNO ₃ concentration is corrected.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The daily average values are revised and the values for which the parameter is zero has not been considered for further emission reduction calculation. The same is inline with AM0034 and is acceptable. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding:	CAR D6		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	During the assessment of MR 2, it is observed that the permitted range for the parameter of Oxidation Temperature, Oxidation Pressure, Ammonia Flow Rate and Ammonia - air ratio is not in compliance to the range as described in the PDD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Appropriate correction is done in revised Monitoring Report and emission reduction sheet which now provides the permitted range in compliance to registered PDD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The Permitted ranges for the parameters have been revised considering the permitted range for the parameter of Oxidation Temperature, Oxidation Pressure, Ammonia Flow Rate and Ammonia - air ratio as provided in the registered PDD. The exclusion of the data sets beyond the permitted range for the statistical analysis is assessed to be appropriate, conservative and in compliance with the methodology AM0034 ver. 3 thus is acceptable. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding:	CAR E1
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Finding:	CAR E1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The values in the excel sheet for emission reduction calculations are not traceable. Appropriate corrections are required.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The values in the excel sheet for emission reduction calculation sheet are now linked from base data sheet onwards.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The emission reduction sheet has been revised to incorporate the traceability, further an index sheet is provided to explain the flow of the information.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Finding:	CAR E2		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The calculation of the moving average factor is not correct as the value of first campaign factor (EF ₁) is not as per the pending corrective actions of first periodic verification.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	As per Recommendation by the Meth Panel (Date of Meth Panel meeting: 7 - 11 March 2011) on request for clarification (AM_CLA_0204) on Approved Methodologies (reference 'F-CDM-AM-Clar_Resp_ver 01.1 '). For the calculation of the moving average emission factor EF _{ma,n} , the emission factor of the first campaign shall be excluded if it is partially outside the crediting periods.]. This methodology has been followed in the revised Monitoring Report.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	As per the clarification AM_CLA_204 the emission factor for a period consisting part campaigns shall be calculated for a period which is under the crediting period for the project activity. Thus the project emission factor has been calculated for the days which falls after the date of registration, i.e. 20/11/2009. Thus the calculation is acceptable and found correct. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CRs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity.

Table 5-1: Project Parties and project participants

Characteristic	Party	Project Participant
Non-Annex 1	India	Rashtriya Chemicals and Fertilizers Limited
Annex 1	Switzerland	Rashtriya Chemicals and Fertilizers Limited

5.2. Implementation of the project

The DeN₂O catalyst at RCF HP nitric acid production plant was commissioned on 31/03/2009. The total capacity of the nitric acid plant is 352 tHNO₃/Day (100%). During the verification a site visit was carried out to confirm the physical installation at the site. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the registered PDD.

No changes in project equipment/meters have been observed for the current monitoring period.

Further there have been cases of downtimes for the CEM system as well as for the plant operation during the current monitoring period. The CEM system was down for a period of total 120 hours in which 86 hours were due to plant shut down, 21 hours was for problem in data logger while the rest 13 hours was due to problem in the sample probe. CAR B4 has been raised as the exclusion of data for the downtimes has not been done consistently, subsequently the MR was revised. The reasons for the shutdown have been detailed under section Appendix II and the data has during the shutdown period has not been considered for further analysis thus CAR B4 was

closed. The detailed assessment of the CAR is provided under section 4 (Verification Findings) of this report.

5.3. Project history

As per this section, verification team has performed the detailed study of project activity by means of site visit investigation, interviews, document review, data analysis etc. In accordance with EB 48, Annex 66 & 67 and EB 70, Annex 11, B.1/EB70, Annex 3; § 225 a, 226), the verification team has confirmed during the site visit that the operational equipment (physical installations) of the project activity are consistent with the registered PDD. There were no changes observed from the project activity as described in the registered PDD. However, a request for Deviation for the monitoring of Operating Hour has been submitted and same was accepted by CDM-EB on 08/11/2011 (<http://cdm.unfccc.int/Projects/deviations/38618>).

Further a Request for revision in Monitoring plan in accordance with the guidance from CDM EB under the Approval for Deviation has been submitted and approved by CDM EB on 15th November 2012. The revised monitoring plan is available on the project page (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1248695616.14/view>)

Furthermore as this is the 2nd periodic verification the issues open during the previous verification activity are required to be addressed. However no FAR was raised during the 1st verification.

The project was registered under CDM EB on 20th November 2009. As required under the methodology AM0034 the baseline and historical campaign have been evaluated for the determination of the permitting operating range for the project. The baseline campaign and historical were conducted for the project, the details are as follows;

Historical Campaign 1	Date: 08/11/2005 to 12/03/2006
Historical Campaign 2	Date: 13/03/2006 to 14/11/2006
Historical Campaign 3	Date: 17/11/2006 to 17/06/2007
Historical Campaign 4	Date: 21/06/2007 to 18/01/2008
Historical Campaign 5	Date: 20/01/2008 to 01/07/2008
Baseline Campaign	Date: 04/09/2008 to 08/12/2008

Based on the historical and baseline campaigns the following parameters were determined:

Parameters	Unit	Historical/ Baseline Values	Specification of the facility	Permitted Range as per PDD
N ₂ O Concentration in the stack gas (NCSG _{BC})	mgN ₂ O/ Nm ³	4,054.1	-	-
Volume flow rate of the stack gas (VSG _{BC})	Nm ³ /h	49,077.4	-	-
Operating Hours (OH _{BC})	Hours	2,861	-	-
Nitric Acid (as 100%) (NAP)	tHNO ₃	43,326	-	-
Overall measure uncertainty of the monitoring system (UNC)	%	4.52	-	-
Ammonia gas flow rate (AFR _{max})	Kg/h	5,113	6,076	5113
Ammonia to Air Ratio (AIFR _{max})	%	11.9	11.5	11.5
Oxidation Temperature for each hour (OT _{normal})	Deg C	863-900	860-930	863-900
Oxidation Pressure for each hour (OP _{normal})	kPa	660-626	765	660-626

The values for the permitted range used during the 2nd MP for the 1. version of ER calculation were not in line with the values in the registered PDD, thus CAR D6 has been raised. Subsequently the revised MR and calculation sheet applies the permitted range as per the registered PDD, leading to exclusion of data sets which are beyond the permitted range. The application of the permitted range as per the registered PDD is assessed to be correct and conservative thus CAR D6 has been closed.

The average historic campaign length (CL_{normal}) has been determined to be 44,435 t HNO₃/campaign while the baseline campaign length is 43,326 t HNO₃.

The normal gauze supplier for the project is RCF itself. The baseline gauze composition was reconfirmed to be 92% Pt, 8% Rh.

The secondary catalyst for the campaigns was supplied by M/s. BASF. The DeN₂O catalyst was installed under the Pt gauze in the Ammonia Oxidation Reactor (AOR) 31st March 2009. The catalyst was in operation during whole MP i.e. from 13th February 2010 to 07th July 2010.

It can be concluded that there was no exchange of equipment since installation of catalyst.

5.4. Post registration changes

The following post registration changes applicable for this monitoring period have been observed during the monitoring period.

However, a request for Deviation for the monitoring of Operating Hour has been submitted and same was accepted by CDM-EB on 08/11/2011 (<http://cdm.unfccc.int/Projects/deviations/38618>).

Further a Request for revision in Monitoring plan in accordance with the guidance from CDM EB under the Approval for Deviation has been submitted and approved by CDM EB on 15th November 2012. The revised monitoring plan is available on the project page (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1248695616.14/view>)

5.5. Compliance with the monitoring plan

During the on-site visit, the verification team checked the implementation of monitoring system covering all the monitoring parameters as per the approved monitoring plan. The monitoring system and all applied procedures are observed not be completely in compliance to the registered monitoring plan. Thus CAR B2 was raised as the approach to calculate the Operating hour was not in line with the approach as per the registered monitoring plan.

Due to a different approach adopted for calculation of the parameter “Operating Hour” a Request for Deviation was submitted and same was accepted by CDM-EB on 08/11/2011 (<http://cdm.unfccc.int/Projects/deviations/38618>). Hence for the current monitoring period the parameter of OH has been monitored based on the flow of ammonia to the reactor which is consistent with the approach followed in the baseline scenario as well as the request for revision in the monitoring plan sought for the project activity.

5.6. Compliance with the monitoring methodology

The monitoring system is in compliance with the applied monitoring methodology (AM0034 version 3.2). The following requirements are complied as required by AM0034 version 3.2.

Requirements for the Automated monitoring system, i.e the CEM installed at RCF plant supplied by M/s. ABB Limited;

- The Automated Measuring System installed for the project monitoring is by M/s ABB Ltd. in compliance to EN14181 and is certified by an external third party TUV SUD, Germany for its compliance to EN14181 and AM0034 (during QAL2).
- The N₂O analyser of make ABB AO2000 URAS 26 is continuous NDIR industrial photometer that can selectively measure concentrations of up to four sample components. The monitoring frequency is every second which is better than the required frequency of every 2 seconds as specified in the methodology. The analyser is equipped to measure only N₂O concentrations.
- The flow meter installed to measure the flow, temperature and pressure of the stack gas is from ABB which is based on dynamic differential pressure generated by the SDF flow sensor probe rod using the ABB's differential pressure transmitter.
- The temperature and pressure in the stack is continuously monitored automatically by the CEM (Continuous Emission Monitoring system) installed. The CEM is certified by third party TUV SUD, Germany for its compliance to EN14181 and AM0034 (during QAL2).

The CEM is subject to 3 level of test as per the requirement of EN14181 the tests are as follows;

- QAL 1 test report dated 23/06/2008 is provided by ABB the supplier of the Automated measuring system for compliance of EN 14181 QAL 1.
- QAL 2 test is carried by a third party TUV SUD, which confirms the CEM complies to the requirement under EN14181. The QAL 2 test was carried on 21st to 23rd October 2008.
- QAL 3 tests of the analyzer which carries out auto (zero and span gas) calibration on weekly basis and manual calibration w.r.t a span gas at an interval of 3 months.
- Annual Surveillance Test was not conducted in 2009, however in line with EB 70 annex 03 para 238 (a) as the AST in 2010 was found satisfactory, the error % based on the QAL 2 has been applied in the Emission reduction calculations on VSG and NCSG until 5th March 2010. Further AST was carried in 2010 by SGS Netherland on 4th and 5th March 2010 and for the year 2011 it was carried on 1st, 2nd and 3rd March. In the Annual Surveillance Test (AST) report for 2011, SGS recommended that measuring inaccuracy constants for NCSG which is 62 should not be subtracted and the value of this constant should be made zero in the system, further the VSG determination was found correct. Accordingly, to comply with the recommendation of SGS, all NCSG readings during the monitoring period are added with 62 and further used for CER calculation. Though the changes in constants are observed in 2011

reports however the same have been applied to the current monitoring period also. This is assessed to be conservative measure.

The total downtime during this Monitoring Period observed for the automated measuring system (CEM) installed in RCF during which the highest value of NCSG and VSG are applied is detailed as follows;

downtime of 34 hrs due to Analyser and remote login problem;

- Highest value of NCSG in the campaign applied (1,593.42 mg/Nm³).

downtime of 21 hrs due remote login problem;

- Highest value of VSG in the campaign (55,077.33 Nm³/h).

The total plant shut down was observed for 608 hours due to operational issues and maintenance.

The verifier confirms that highest value of NCSG and VSG are applied correctly for hours of downtime of the automated measuring system (CEM) installed in RCF.

Correct QAL 2 Correction Factors as per QAL 2 test in October 2008 were used for the monitoring:

Measuring Parameter	Correction Factor	
	A	b
N ₂ O	- 1979.8	494.9
Volume Flow	- 29898	7474.5
Temperature (stack gas flow)	-63.2	15.8
Pressure (stack gas flow)	-398	99.6

As mentioned before, during the Annual Surveillance Test conducted in March 2011 by SGS, a change in the equation for NCSG, was observed; SGS has recommended that measuring inaccuracy constants for NCSG which is 62 should not be subtracted and the value of this constant should be made zero in the system. Accordingly, to comply with the recommendation of SGS, all NCSG readings during the Monitoring

period are added with 62 and further used in for CER calculations. Though the correction is observed in March 2011 however it has been applied as conservative measure retrospectively. The calculations for the same are assessed and have been detailed and traceable in the emission reduction calculation sheet named “Raw Data”. Due to application of the revised factor the emission reduction calculations are correctly determined.

Further, during the review of project documents, it was observed that the master calibrator for functions of temperature, pressure and flow were of lower accuracy then the actual instrument accuracy. Thus CAR C1 was raised. The PP has replaced the master calibrators considering the issue, however to address the same for the current monitoring period a conservative approach w.r.t to the maximum possible error has been applied leading to reductions in the Emission reductions. The same is detailed under section 4 (Verification findings) in of this report w.r.t closure of CAR C1.

Campaign length:

The length of project campaign is CL_n (44,576.23 tHNO₃ calculated for the complete campaign) which is higher than CL_{normal} (44,435 tHNO₃) hence adjustment in the emission factor for the project campaign is not required and the baseline is applicable. The same is in line with the requirements under EB 51, Annex 12.

Emission factor calculations for the project; Campaign 2:

- Baseline emission factor for the project is 0.0125 tN₂O/ tHNO₃
- Project emission factor during the campaign is 0.0032 tN₂O/ tHNO₃
- Moving average emission factor: According AM_CLA_0204 the calculation of the moving average emission factor EF_{ma,n}, the emission factor of the first campaign was excluded as it is partially outside the crediting period. EF_{ma,n} is calculated as 0.0032 tN₂O/ tHNO₃.

5.7. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification

checklist under Annex 2 table A-2 section D. CAR D1 to CAR D5 has been raised and subsequently closed during the verification.

As mentioned before, it was observed that the master calibrator for functions of temperature, pressure and flow were of lower accuracy than the actual instrument accuracy. Thus CAR C1 was raised. The PP has replaced the master calibrators considering the issue, however to address the same for the current monitoring period a conservative approach w.r.t to the maximum possible error has been applied leading to reductions in the Emission reductions. The same is detailed under section 4 (Verification findings) in of this report w.r.t closure of CAR C1.

A delay in calibration was observed for VSG, PSG and TSG. The delayed calibration reports were checked to confirm that the errors were within the permissible limits thus in line with para 238 (a) of EB 70 annex 03 the maximum error of the instrument has been applied and is traceable in the emission reduction calculation sheet "combined accuracies". Subsequently CAR D2 was closed. The calculations are traceable in the emission reduction sheet and is checked and confirmed.

Further it was observed that AST for year 2009 was not carried out, thus the AST report of 2010 was checked to confirm the functioning of the CEM system. The AST of 2010 confirms the CEM system to be in line with the QAL2 report, thus in line with EB 52 annex 60 para 4 (b) (also according EB 70 annex 3 para 238 (a)) the error in the monitoring for VSG and NCSG have been applied for emission reduction calculations. The error factor of 2.93% for VSG and 3.44% for NCSG has been applied; the values have been cross-checked with the QAL 2 report and are acceptable. Further the application of the error factor leads to a reduction of approximately 283 CERs. Thus the approach is assessed to be conservative, appropriate and in compliance to EB 70 annex 03 para 238 (a).

As mentioned before, during the Annual Surveillance Test (AST) conducted by SGS in March 2011 it was observed that measuring inaccuracy constants for NCSG is 62 SGS has recommended that there should not be any deletion or addition of these constants and the same should be done modified in the CEM system. Accordingly the corrections were carried out by ABB. The revisions in the constants have been applied to the entire monitoring period leading to marginally higher project emissions, thereby lower emission reductions. This has been assessed to be conservative and appropriate.

The calibration details including the date, due date, frequency, accuracy of the meters, date, meter serial number^{/CAL/, /TS/} for each of the parameters monitored in the project activity are described as follows;

Data Variable	Description	Data Unit	Instrument Tag no.	Sr. No.	Accuracy	Date of Previous calibration	Date of calibration	Calibration frequency	Due date of calibration
AFR &	Amm gas to N	Nm ³ /Hr	FT120 211A	S198744	± 0.075% of span	17/08/2009	06/08/2010	1 Year	06/08/2011

AIFR	001								
AFR & AIFR	Amm gas to N 001	Nm3/Hr	FT120 211B	S198745	± 0.075% of span	17/08/2009	06/08/2010	1 Year	06/08/2011
AFR & AIFR	Amm gas to N 001	Nm3/Hr	FT120 211C	S198746	± 0.075% of span	19/08/2009	06/08/2010	1 Year	06/08/2011
OP	Amm - inlet to N001	Bar (gauge)	PT 120212 A	1209936	± 0.075% of span	19/08/2009	04/08/2010	1 Year	04/08/2011
OP	Amm - inlet to N001	Bar (gauge)	PT 120212 B	1209934	± 0.075% of span	19/08/2009	04/08/2010	1 Year	04/08/2011
OP	Amm - inlet to N001	Bar (gauge)	PT 120212 C	1209937	± 0.075% of span	19/08/2009	04/08/2010	1 Year	04/08/2011
AIFR	Amm - inlet to N001 temp	° C	TT 120212 A	NA	Deviation after calibration: 0.1% of F.S. value	19/08/2009	02/08/2010	1 Year	02/08/2011
AIFR	Amm - inlet to N001 temp	° C	TT 120212 B	NA	Deviation after calibration: 0.1% F.S. value	17/08/2009	02/08/2010	1 Year	02/08/2011
AIFR	Amm - inlet to N001 temp	° C	TT 120212 C	NA	Deviation after calibration: 0.1% F.S. value	17/08/2009	02/08/2010	1 Year	02/08/2011
AIFR	Air Flow-N001	Nm3/Hr	FT 120213 A	S198740	± 0.10% of span	17/08/2009	06/08/2010	1 Year	06/08/2011
AIFR	Air Flow-N001	Nm3/Hr	FT 120213 B	S198741	± 0.10% of span	17/08/2009	06/08/2010	1 Year	06/08/2011
AIFR	Air Flow-N001	Nm3/Hr	FT 120213 C	S198742	± 0.10% of span	19/08/2009	06/08/2010	1 Year	06/08/2011
AIFR	Air inlet to N001	Bar (gauge)	PT120 214A	S0198760	± 0.075% of span	17/08/2009	05/08/2010	1 Year	05/08/2011
AIFR	Air inlet to N001	Bar (gauge)	PT120 214B	S0198761	± 0.075% of span	19/08/2009	05/08/2010	1 Year	05/08/2011
AIFR	Air inlet to N001	Bar (gauge)	PT120 214C	S0198762	± 0.075% of span	19/08/2009	05/08/2010	1 Year	05/08/2011
AIFR	Air inlet to N001 temp	° C	TT 120214 A	NA	Deviation after calibration: 0.1% of F.S. value	17/08/2009	04/08/2010	1 Year	04/08/2011
AIFR	Air inlet to N001 temp	° C	TT 120214 B	NA	Deviation after calibration: 0.1% of F.S. value	19/08/2009	04/08/2010	1 Year	04/08/2011

AIFR	Air inlet to N001 temp	° C	TT 120214 C	NA	Deviation after calibration: 0.1% of F.S. value	19/08/2009	04/08/2010	1 Year	04/08/2011
OT	Catalyst Temp ROO1	° C	TT1203 32A	199556	D/A Accuracy \pm 0.03% of span	18/08/2009	02/08/2010	1 Year	02/08/2011
OT	Catalyst Temp ROO1	° C	TT1203 33A	199558	D/A Accuracy \pm 0.03% of span	18/08/2009	02/08/2010	1 Year	02/08/2011
OT	Catalyst Temp ROO1	° C	TT1203 34A	199560	D/A Accuracy \pm 0.03% of span	18/08/2009	02/08/2010	1 Year	02/08/2011
NCS G	N2O Analyser	Mg/m ³	AI 120400	02400712 28/2400	Repeatability \leq 0.5% of span	16/12/2009	27/02/2010 28/05/2010	3 Months	28/08/2010
VSG	Stack Flow	mBar	FI1204 00	265DS66 00028331	Base Accuracy \pm 0.04%	06/07/2009	08/07/2010	1Year	08/07/2011
PSG	Stack Pressure	hPa (absolute)	PI12040 0	1198949	0.5% of FSO	06/07/2009	08/07/2010	1Year	08/07/2011
TSG	Stack Temp	Deg. cent	TI12040 0	NA	Linearity error : <0.1 % FS	06/07/2009	08/07/2010	1Year	08/07/2011
NAP	Product acid flow	T/hr	FI1012 1	SEN.- 12031565 , TRANS.- 3781972	\pm 0.1% of rate	24/06/2008		3 Years	24/06/2011
NAP	Acid Density	gm/cc	NA	NA	Least count: 0.001	30/11/2009	28/05/2010	6 months	27/11/2010
NAP	Acid Temperature	° C	NAG/L/T M-1	NA	Least count: 1	25/11/2009	25/11/2009	1 Year	25/11/2010

After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements. Thus the CARs have been closed out. The details of each issue is described under section 4 (Verification Findings) of this report.

5.8. Monitoring report

A draft monitoring report was submitted to the verification team by the project participants. The team has made this report publicly available prior to the start of the verification activities. No comments were received.

During the verification, mistakes and needs for clarification were identified, thereby CAR A1, CAR A2, CAR A3 and CAR B1 to CAR B4 were raised. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and in accordance with the registered PDD and other relevant requirements. Thus the CARs are closed out. The details of each issue is described under section 4 (Verification Findings) of this report.

5.9. Sampling

5.9.1. Implementation of the sampling plan

No sampling was required to determine the monitored parameters.

5.9.2. Sampling approaches during verification

No sampling approaches were taken during the verification.

5.10. ER Calculation

During the verification mistakes in the ER calculation were identified. Thus CAR E1 to CAR E2 were raised and subsequently closed out as the final values of emission reductions were revised.

The same is detailed under section 4 (Verification findings) in of this report w.r.t closure of Findings.

A revised ER calculation was prepared by the PP and presented to the verification team. All raised issues were addressed appropriately so that all corresponding CARs could be closed out. Thus it is confirmed that the ER calculation is overall correct and conservative.

Results:

Parameter	Values During 2nd Monitoring Period	Unit
NAP	44,576.23	tHNO ₃
EF _{BL}	0.0125	tN ₂ O/tHNO ₃
EF _p	0.0032	tN ₂ O/tHNO ₃
GWP _{N₂O}	310	tCO _{2e} /tN ₂ O

$$ER = (0.0125 - 0.0032) * 44,576.23 * 310 = 127,876 \text{ tCO}_{2e}$$

The claimed emission reductions in this monitoring period from 13th February 2010 to 07th July 2010 are verified and found correct and reasonable.

5.11. Quality Management

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this CDM project activity have been defined. The procedures defined can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during the verification.

The stack gas monitoring system is designed as an automatic process, so the involvement of the personnel during normal operation is minimal. In case of any deficiency, appropriate procedures are in place. For this monitoring system, the quality assurance and control procedure is also according to EN14181 which stipulates three levels:

- QAL1: the evaluation according to EN ISO14956 has been carried out by TUV SUD, Germany on 23/06/2008 before installation of CEM ^{/QAL/}.
- QAL 2 test is carried by a third party TUV SUD, which confirms the CEM complies to the requirement under EN14181. The QAL 2 test was conducted on 21st to 23rd October 2008 and the QAL 2 test in the year 2011 was carried out by TUV Rhineland from 24-27th October 2011.
- QAL 3 tests of the analyzer which carries out auto calibration on weekly basis and manual calibration w.r.t a span gas at an interval of 3 months.
- Annual Surveillance Test was not conducted in 2009, however in line with EB 70 annex 03 para 238 (a) as the AST in 2010 was found satisfactory, the error % based on the QAL 2 has been applied in the Emission reduction calculations till 5th March 2010 and is traceable in the emission reduction calculation sheet "raw data sheet". Further AST was carried out in March 2010 by SGS Netherland on 4th and 5th March 2010 and for the year 2011 it was carried on 1st, 2nd and 3rd March. In the Annual Surveillance Test (AST) report for 2011, SGS recommended that measuring inaccuracy constants for NCSG which is 62 should not be subtracted and the value of this constant should be made zero in the system. Accordingly, to comply with the recommendation of SGS, all NCSG readings during the monitoring period are added with 62 and further used for CER calculation. This is a conservative measure.

In order to operate and maintain the monitoring system, local operators and instrumentation engineers of the system have been trained by RCF and the equipment supplier. Furthermore the competence of the personnel was confirmed from training records also there is no change in relevant CDM personnel for all positions.

All monitoring devices have been calibrated and maintained periodically to ensure the accuracy of measurement. All calibrations were carried out per internationally accepted procedures.

All data have been archived electronically and/or in hard copy and was accessible during verification site visit, however CAR B1- B4 were raised during the audit and subsequently closed out. The details of each issue is described under section 4 (Verification Findings) of this report.

5.12. Actual emission reductions during the first commitment period and the period from 1 January 2013 onwards

The MR includes actual ER values achieved up to 31 December 2012 and actual values achieved from 1 January 2013 onwards as follows:

Table 5-2: Emission reductions before and after the end of 2012

	until 2012-12-31 ¹⁾	from 2013-01-01 ¹⁾	Sum
Emission reductions [tCO _{2e}]	127,876	-	127,876

¹⁾ Both days included

5.13. Comparison with ex-ante estimated emission reductions

The MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered PDD.

The emission reductions determined for the second project campaign covering the monitoring period from 13th February 2010 to 07th July 2010 (145 days) is 127,876 tCO_{2e}. The total emission reduction for the monitoring period is less than the PDD estimated value of 177,697 tCO_{2e} for 145 days (447,305 tCO_{2e}/annum).

5.14. Overall Aspects of the Verification

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.



Access was granted to all installations of the plant which are relevant for the project performance and the monitoring activities.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the UNFCCC criteria and relevant guidance provided by the COP/CMP and the CDM EB (clarifications and/or guidance).

5.15. Hints for next periodic Verification

There were no changes observed from the project activity as described in the registered PDD. The replacement of the master calibrator has been carried out and confirmed with the documentary evidences, however the actual implementation shall be confirmed during the next verification activity.

6. VERIFICATION AND CERTIFICATION STATEMENT

Rashtriya Chemicals and Fertilizers Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: “N₂O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India”, with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to catalytic reduction of N₂O a potent GHG which is an undesirable by-product of nitric acid production process. This verification covers the period from 2010-02-13 to 2010-07-07(including both days).

In the course of the verification 18 Corrective Action Requests (CAR) and no Clarification Requests (CL) were raised and successfully closed. Furthermore no FARs are raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AM0034, Version 3.2
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately, in case of delay the procedure as per VVS version 3.0 Para 238 (a) has been followed appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **127,876** t CO_{2e}

Essen, 2013-07-03



Mr. Rainer Winter

TÜV NORD JI/CDM Certification
Program

Verification Team Leader

Essen, 2013-07-03



Mr. Dr. Jochen Schubert

TÜV NORD JI/CDM Certification
Program

Final Approval

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
/AST/	<ul style="list-style-type: none"> Annual Surveillance Test conducted by SGS on 4th and 5th March 2010 Annual Surveillance Test conducted by SGS on 1st, 2nd, and 3rd March 2011
/ALARM/	Log book record for implementation of alarm for CEM system connected to the DCS monitoring room.
/BR/	Breakdown / Annual maintenance records for the respective equipments related to the for the project activity during the monitoring period
/CAL/	Calibration certificates for the monitoring equipments used during the monitoring period as per Appendix III of MR Version 03 and as described under section 5.8 of the Report.
/CHART/	Charts indicating concentration at various temperature, specific gravity for determination of concentration of product nitric acid
/CR/	Commissioning Certificates for 1. Secondary Catalyst in the ammonia reactor 2. All the stake monitoring equipments
/DCS/	Sample results of the following 1. Data of Ammonia to air ratio obtained transmitted from DCS 2. Oxidation temperature of each hour transmitted from DCS 3. Oxidation pressure of each hr transmitted from DCS
/DR-AM34/	Sample Daily Reports copies generated by the EMI 3000 software.
/GS/	Details for the Gauze monitoring; <ul style="list-style-type: none"> Gauze fabrication contract with Ravindra Heraeus Private Limited dated 25th May 2009. Gauze composition analysis report by Heraeus, Germany dated 2010-01-22
/IAR/	Internal audit reports and results respective to the project activity
/INT/	Inter Log Diagram for RCF MP unit.

Reference	Document
/ISO/	Copy of ISO 9001:2008 Certificate dated 6 th May 2010 valid till 19 th July 2013
/LAB/	Results of Plant Laboratory for average concentration of Nitric acid
/LOG/	Log (Records) of the following are checked: <ul style="list-style-type: none"> • N₂O concentration in the stake gas • Operating Hour of the reactor • Average concentration of nitric acid (%)
/LA/	Layout of the project activity site describing the metering position
/MR/	<ul style="list-style-type: none"> • Monitoring report for the project version 01 dated 03/06/2010 based on which the Verification activity has been conducted • Monitoring report for the project version 02 dated 23/07/2010 based on which the Verification activity has been conducted • Monitoring report for the project version 03 dated 11/12/2012 based on which the Verification activity has been conducted. • Monitoring report for the project version 04 dated 08/02/2013 based on which the Verification activity has been concluded.
/MEDAS/	Mail received from ABB by RCF regarding monitoring frequency of data acquisition system dated 2009-04-20
/ORG/	Organizational chart with roles and responsibility of operating personnel working on the project activity for data collection, archiving and monitoring activities (operational and management structure for the project activity)
/REPLACE/	Replacement equipment/meter/instrument records respective to the project activity during the Monitoring period.
/ QAL/	Test Certificate for; <ul style="list-style-type: none"> • QAL1 certificate, dated 23-06-2008 , • QAL 2 report dated 11-11-2008 as per standard (EN 14181) (Test conducted on 21-23 October 2008) by TUV SUD Industrie Service GmbH • QAL 2 report conducted on 24 – 27th October 2011 by TUV Rheinland.
/QMS/	Quality Management System of RCF
/SC/	Consent to operate from Maharashtra state pollution control board valid till 31/10/2011.
/TS/	Technical specification of all the equipment installed. 1. Secondary Catalyst in the ammonia reactor

Reference	Document
	2. All the stack monitoring equipments 3. Technical specification of ABB A02000 URAS 26 for analyzing N ₂ O concentration
/TRA/	Training records of the plant personal to carry out the continuous Emission Monitoring System by ABB
/XLS/	ER calculation sheets for the project activity (initial intermediate and final)

Table 7-2: Background investigation and assessment documents

Reference	Document
/AM0034/	AM0034, Version 3.2, "Catalytic reduction of N ₂ O inside the ammonia burner of nitric acid plants"
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/GLMP/	Guidelines: Completing the monitoring report form (EB 70, Annex 11)
/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/MRT/	Monitoring Report Form (F-CDM-MR), Version 03.1
/PDD/	Project Design Document for CDM project: " <i>N₂O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India</i> " version 1.2, dated 2009-07-21
/PS/	CDM Project Standard (Version 02.1, EB 70, Annex 2)
/VAL/	Validation Report for CDM project " <i>N₂O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India</i> " version 1, dated 2009-07-24

Reference	Document
/VER/	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)
/VVS/	CDM Validation and Verification Standard (Version 03.0, EB 70, Annex 3)

Table 7-3: Websites used

Reference	Link	Organisation
/cpcb/	http://cpcb.nic.in/	Central Pollution Control Board, India.
/unfccc/	http://cdm.unfccc.int	UNFCCC
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/cd4cdm/	http://www.cd4cdm.org/	UNEP Risoe Centre

Table 7-4: List of interviewed persons

Reference	Mol ¹		Name	Organisation / Function
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	A.B. Khare	Dy.GM (Corporate), RCF,
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	N. R Kamat	DGM (Technical Services), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	R. Paradkar	DGM(Co-ordination), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	D. V. Bhagat	C.E (Plant), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Dilip Deshmukh	Advisor (Projects), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	P.V. Kharate	Dy. CE (Plant), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr.	B.G Galgali	Operations Manager (Nitric Acid),



Reference	Mol ¹		Name	Organisation / Function
		<input type="checkbox"/> Ms.		RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Girish D. Temgire	Dy. CE (corporate), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	D.K Srivastav	DGM (Chemical), RCF
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Uddhav More	MT (Corporate Technical), RCF

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)

ANNEX

- A1:** Verification Protocol
- A2:** Statements of Competence of
involved Personnel

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
Raw data generation				
<ul style="list-style-type: none"> • Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy • Change of technology 	<ul style="list-style-type: none"> • Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspections of installed equipment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment • Stand-by duty is 	<ul style="list-style-type: none"> • Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures • Insufficient accuracy • Inappropriate QA/QC 	<ul style="list-style-type: none"> • Site – visit • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-check of raw data and commercial data • Check of CDM management system • Check of CDM related procedures 	<ul style="list-style-type: none"> • See Table A-2

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
<ul style="list-style-type: none"> Accuracy of values supplied by Third Parties 	<ul style="list-style-type: none"> organized Training Internal audit procedures Internal check of QA/QC measures of involved Third Parties 	<ul style="list-style-type: none"> measures of Third Parties 	<ul style="list-style-type: none"> Application of CDM management system procedures Check of trainings Check of responsibilities Check of QA/QC documentation / evidences of involved Third Parties 	
Raw data collection and data aggregation				
<ul style="list-style-type: none"> Wrong data transfer from raw data to daily and monthly aggregated reporting forms IT Systems Spread sheet programming Manual data transmission Data protection Responsibilities 	<ul style="list-style-type: none"> Cross-check of data Plausibility checks of various parameters. Appropriate archiving system Clear allocation of responsibilities Application of CDM Management system procedures Usage of standard software solutions 	<ul style="list-style-type: none"> Unintended usage of old data that has been revised Incomplete documentation Ex-post corrections of records Ambiguous sources of information Non-application of management system procedures Manual data transfer mistakes 	<ul style="list-style-type: none"> Check of data aggregation steps Counter-calculation Data integrity checks by means of graphical data analysis and calculation of specific performance figures Check of management system certification Check of data archiving system 	<ul style="list-style-type: none"> See Table A-2

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
	(Spreadsheets) <ul style="list-style-type: none"> Limited access to IT systems Data protection procedures 	<ul style="list-style-type: none"> Unintended change of spread sheet programming or data base entries Problems caused by updating/upgrading or change of applied software 	<ul style="list-style-type: none"> Check of application of Management system procedures 	
Other calculation parameters				
<ul style="list-style-type: none"> Emission factors, oxidation factors, coefficients 	<ul style="list-style-type: none"> The values and data sources applied are defined in the PDD and monitoring plan 	<ul style="list-style-type: none"> Unintended or intended Modification of calculation parameters Wrong application of values Misinterpretations of the applied methodology and/ or the PDD Missing update of applicable regulatory framework (e.g. IPCC values) 	<ul style="list-style-type: none"> Update-check of regulatory framework Countercheck of the applied MP in the MR against the methodology and the PDD 	<ul style="list-style-type: none"> See Table A-2
Calculation Methods				

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
<ul style="list-style-type: none"> Applied formulae Miscalculation Mistakes in spread-sheet calculation 	<ul style="list-style-type: none"> Advanced calculation and reporting tools A CDM coordinator is in charge of the CDM related calculations Usage of tested / counterchecked Excel spreadsheets Involvement of external consultants 	<ul style="list-style-type: none"> The danger of miscalculation can only be minimized. 	<ul style="list-style-type: none"> Countercheck on the basis of own calculation. Spread sheet walk-through. Plausibility checks Check of plots 	<ul style="list-style-type: none"> See Table A-2
Monitoring reporting				
<ul style="list-style-type: none"> Data transfer to the author of the monitoring report Data transfer to the monitoring report Unintended use of outdated versions 	<ul style="list-style-type: none"> An experienced CDM consultant is responsible for monitoring reporting. CDM QMS procedures are defined 	<ul style="list-style-type: none"> The danger of data transfer mistakes can only be minimized Inappropriate application of QMS procedures 	<ul style="list-style-type: none"> Counter check with evidences provided. Audit of procedure application 	<ul style="list-style-type: none"> See Table A-2

Table A-2: (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A. Description of the project activity				
A.1. Purpose and general description of the project activity (EB 70, Annex 11, A.1) <i>Check if section A.1 of the MR includes the following:</i> <ul style="list-style-type: none"> - Purpose of the PA and the measures taken to reduce GHG emissions - Brief description of the installed technology and equipment - Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc.) - Total emission reductions achieved in this monitoring period 	/MR/	<p>The verification team has checked section A.1 of the MR and confirms that the information provided is complete and correct with regards to the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Purpose of the PA and the measures taken to reduce GHG emissions <input checked="" type="checkbox"/> Brief description of the installed technology and equipments <input type="checkbox"/> Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc) <input checked="" type="checkbox"/> Total emission reductions achieved in this monitoring period <p>In this context the following findings have been identified: Nevertheless CAR A1 and CAR A2 have been raised.</p>	CAR A1	OK
A.2. Location of project activity (EB 70, Annex 11, A.2) <i>Check if section A.2 of the MR reflects correctly the following:</i> <ul style="list-style-type: none"> - Host Party(ies) - Region / State / Province etc. - City / Town / Community etc. 	/MR/ /PDD/ /IM/	<p>The verification team has checked section A.2 of the MR and confirms by means of comparison with the information given in the PDD and information gathered during the site visit that the information provided is complete and correct with regards to the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Host Party(ies) <input checked="" type="checkbox"/> Region / State / Province <input checked="" type="checkbox"/> City / Town / Community 	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
- <i>Physical / geographical location (e.g. Latitude and Longitude)</i>		<input checked="" type="checkbox"/> Physical / Geographical location In this context the following findings have been identified: N/A		
A.3. Parties and Project Participants (EB 70, Annex 11, A.3) <i>Check if section A.3 of the MR includes the following:</i> <ul style="list-style-type: none"> - <i>All PPs as displayed on the UNFCCC website</i> - <i>A correctly filled table as per the MR template</i> 	/MR/ /unfccc/	The verification team has checked section A.3 of the MR as well as the UNFCCC website and confirms that: <input checked="" type="checkbox"/> all PPs as displayed on the project related UNFCCC website are correctly listed <input checked="" type="checkbox"/> the table as per the template MR has been correctly filled In this context the following findings have been identified: N/A	OK	OK
A.4. Reference of applied methodology (EB 70, Annex 11, A.4) <i>Check if section A.4 of the MR correctly describes / includes the following:</i> <ul style="list-style-type: none"> - <i>Reference to the applicable version of the methodology</i> - <i>Reference to the applicable version(s) of relevant methodological tools</i> - <i>Relevant EB decisions, if applicable</i> 	/MR/ /PDD/ /unfccc/	The verification team has checked section A.4 of the MR and confirms by means of comparison with the information given in the PDD and displayed on the UNFCCC website that the information provided is complete and correct with regards to the following: <input checked="" type="checkbox"/> Name and version of the applicable CDM Methodology <input checked="" type="checkbox"/> Name and version of applicable CDM methodological tools <input checked="" type="checkbox"/> Relevant EB decisions In this context the following findings have been identified: N/A	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A.5. Crediting period of project activity (EB 70, Annex 11, A.5) <i>Check if section A.5 of the MR correctly includes the following:</i> <ul style="list-style-type: none"> - <i>Start date of the crediting period. In this context please check, if applicable, whether post registration changes to the start date have been accepted by the EB.</i> - <i>Length and type of the crediting period</i> 	/MR/ /unfccc/	<p>The verification team has checked section A.5 of the MR and confirms by means of comparison with the information displayed on the UNFCCC website that the information provided is complete and correct with regards to the following:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Start date of the crediting period. <input checked="" type="checkbox"/> Type and length of the crediting period <p>In this context the following findings have been identified: N/A</p>	OK	OK
A.6. Publication of the Monitoring Report (EB70, Annex 3, § 207) <i>Check if the monitoring report has been made publicly available on the UNFCCC website before the verification commenced.</i> <i>Check if comments have been received and if yes, how they have been addressed.</i>	/unfccc/	<p>The verification team has ensured and confirms by means of checking the respective project information on the UNFCCC website that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> The draft monitoring report, as received from the project participants, has been made publicly available prior to the start of the verification activities. <input checked="" type="checkbox"/> No comments have been received. <p>In this context the following findings have been identified: N/A</p>	OK	OK
A.7. Compliance with standardized format of the Monitoring Report (EB70, Annex 3, § 212 e)	/MRT/	<p>The verification team has checked all sections of the MR and confirms by means of comparison with the MR template that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the standardized MR template has been used 	CAR A3	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Check (only) if the latest applicable MR template has been used. For compliance assessment with the MR guideline pl. refer to the respective MR sections.</i>		In this context the following findings have been identified: The MR follows the VVM template, however the same is no longer valid, thus CAR A3 is raised.		
B. Implementation of project activity				
B.1. Description of implemented registered project activity (EB 70, Annex 11, B.1) <i>Check if section B.1 of the MR correctly describes / includes the following:</i> <ul style="list-style-type: none"> - Implementation status of the PA - Detailed description of installed technology(ies) / technical processes and equipment applied - Diagrams (where appropriate) 	/MR/ /PDD/ /PS/ /IM/	The verification team has checked section B.1 of the MR and confirms by means of comparison with the information given in the PDD, the project standard and information gathered during the site visit that: <input checked="" type="checkbox"/> the description of the implementation status of the PA is in line with the applicable provisions of the project standard <input checked="" type="checkbox"/> an appropriate description of the installed technology(ies), technical process and equipment incl. diagrams, where applicable, has been included In this context the following findings have been identified: N/A	OK	OK
B.1.1. Initial project implementation (EB70, Annex 3; § 225 a, 226) <i>Assess whether the project has been implemented and operated as per the registered PDD and are all physical features of the project in place?</i> <i>Further focus on the potential phase wise implementation and check the reporting on the corresponding status and starting dates accordingly.</i> <i>Check if the project is still in compliance with the</i>	/IM01/ /PDD/	<i>Description:</i> The project has been implemented and is operated as per the description in the registered PDD. The physical setup for the project remains the same. <i>Verifier's action:</i> The physical set up was verified during the site visit and discussed with the plant personnel for the operational procedures and is as per the description in the registered PDD.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>applicability conditions of the methodology.</i></p> <p><i>Also, discuss – if applicable – the necessity of PRC notifications / approvals.</i></p>		<p><i>Conclusion:</i></p> <p>The project is implemented and operated as per the registered PDD.</p>		
<p>B.1.2. Technical equipment changes -(EB70, Annex 3; § 225 a, 226)</p> <p><i>Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period. Further ensure that consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied</i></p> <p><i>Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.</i></p> <p><i>In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.</i></p> <p><i>In case of post registration changes pl. refer to chapter B.2.</i></p>	/IM01/ /PDD/	<p><i>Description:</i></p> <p>The project equipment has not changed; the same is described under section B.1.</p> <p><i>Verifier's action:</i></p> <p>The physical set up was verified during the site visit and discussed with the plant personnel for the operational procedures and is as per the description in the registered PDD.</p> <p><i>Conclusion:</i> The project equipment has not been exchanged.</p>	OK	OK
<p>B.1.3. Operation of the project activity -(EB70, Annex 3; § 225 a, 226)</p> <p><i>Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.</i></p>	/IM01/ /PDD/	<p><i>Description:</i></p> <p>The project equipment has not changed, the same is described under section B.1</p> <p>Further, In annexure 1 the end of the campaign is stated as 07.07.2010 00:00, whereas during verification it was found out</p>	CAR	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Consider e.g. interviews with operational personnel, operation log sheets, data management system records.</i></p> <p><i>In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.</i></p> <p><i>In case of post registration changes pl. refer to chapter B.2.</i></p>		<p>to be 07.07.2010 24:00.</p> <p>During the verification site visit it was found that the backup hard disk connected to CEM system is currently not in operation. This is not in line with registered monitoring plan (refer page 44 of the PDD).</p> <p>The EN14181 requirements for QAL 3 are not fully implemented. In this context it shall be referred to the recommendations given under the AST report.</p> <p><i>Verifier's action:</i></p> <p>The physical set up was verified during the site visit and discussed with the plant personnel for the operational procedures and is as per the description in the registered PDD.</p> <p><i>Conclusion:</i> The project equipment has not been exchanged. However CARs/CLs have been raised.</p>	<p>B1</p> <p>CAR B2</p> <p>CAR B3</p>	
<p>B.1.4. Incidents (EB70, Annex 3; § 225 a, 226)</p> <p><i>Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?</i></p> <p><i>Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.</i></p>	/IM01/	<p><i>Description:</i></p> <p>The downtime recorded during the monitoring period has not been detailed along with the reason for downtime in the MR.</p> <p>Further the exclusion of values during plant downtimes/start-ups has not been done consistently. The base data needs to be updated accordingly.</p> <p><i>Verifier's action:</i></p> <p>The downtimes were confirmed from the data records.</p> <p><i>Conclusion:</i></p>	<p>CAR A1</p> <p>CAR B4</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		CAR A1 is raised because missing transparency of shutdowns and CAR B4 as the exclusion of data is not consistent.		
B.1.5. Legislation Find out – esp. in the context of methodological requirements - whether relevant legislation with effect on the project activity in the host country has been changed. Assess, in case of changes, whether consequences for the PA with regard to relevant CDM requirements have been accounted for. In case of changes data sources shall be referenced.	/IM01/	<i>Description:</i> The legislation with effect on the project has not changed during the monitoring period. The project activity requires monitoring effect due to change in the NO _x regulations, however the regulations for the same have not changed. There are no regulations in India for N ₂ O emissions. <i>Verifier's action:</i> The consent to operate by the MPCB (Maharashtra State Pollution Control Board) has been checked and is valid till 31/10/2011 which covers the monitoring period. <i>Conclusion:</i> The relevant host country legislation has not been changed.	OK	OK
B.1.6. Open issues from validation -(EB70, Annex 3; § 213) <i>Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?</i>	/VAL/	<input checked="" type="checkbox"/> There were no open issues addressed in the validation report <input type="checkbox"/> All open issues from the validation have been appropriately addressed. <input type="checkbox"/> The following issues related to the validation have not yet been appropriately addressed:	OK	OK
B.1.7. Open issues from previous verification	/VER/	<input checked="" type="checkbox"/> There were no open issues addressed in the previous verification report	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.												
-(EB70, Annex 3; §§ 213; 284 h) <i>Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR) and take into consideration the guidance as specified in VVS.</i>		<div><input type="checkbox"/> All open issues from the previous verification have been appropriately addressed.</div> <div><input type="checkbox"/> The following issues related to the previous verification have not yet been appropriately addressed:</div>														
B.2. Post registration changes																
B.2.1. Are post registration changes applicable to the proposed project activity?	/PDD/ /MR/ /IM01/	<div><input type="checkbox"/> No, by means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PDD and the applied methodology. (Please proceed with section C)</div> <div><input checked="" type="checkbox"/> Yes, post registration changes have been identified and are assessed in detail in the subsequent steps. (Please proceed with B.2.2.)</div>	OK	OK												
B.2.2. Temporary deviations from the registered monitoring plan or applied methodology (TDfrMP; TDfMM) <i>(EB 70, Annex 11, B.2.1; EB70, Annex 3; §§ 251 - 256)</i> <i>Indicate whether any temporary deviations have been applied during this monitoring periods.</i> <i>In cases where approval has been sought from the EB please provide reference.</i>	/PS/ /unfccc/	<table><tr><td><input type="checkbox"/></td><td colspan="3">No TDfrMP or TDfMM have been submitted to the UNFCCC prior to the current monitoring period</td></tr><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC</td></tr><tr><td>1</td><td>Title</td><td colspan="2">The method of measurement of monitoring parameter Operating Hour of Plant (OH) calculated from operating temperature of reactor based measurement to Ammonia flow to Reactor</td></tr></table>	<input type="checkbox"/>	No TDfrMP or TDfMM have been submitted to the UNFCCC prior to the current monitoring period			<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC			1	Title	The method of measurement of monitoring parameter Operating Hour of Plant (OH) calculated from operating temperature of reactor based measurement to Ammonia flow to Reactor		OK	OK
<input type="checkbox"/>	No TDfrMP or TDfMM have been submitted to the UNFCCC prior to the current monitoring period															
<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC															
1	Title	The method of measurement of monitoring parameter Operating Hour of Plant (OH) calculated from operating temperature of reactor based measurement to Ammonia flow to Reactor														

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.					
<i>If applied, provide a description of the deviation(s). This should include the reasons for the deviation(s), how it deviates from the monitoring plan and/or applied methodology(ies), the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach. Indicate if the deviation will lead to a reduction in the accuracy and if so, which conservative assumptions and discount factors have been applied.</i> <i>For deviation(s) that require prior approval by the Board, include the date of approval and reference number.</i>					based measurement						
				Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved						
				Appr.date	08-11-2011						
				Ref. No.	DEV-0395						
		2		Title							
				Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved						
				Appr.date							
				Ref.No.							
				<input checked="" type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA						
					An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.						
				<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:						
					1					Issue:	
			2	Issue:							

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.														
		<p><i>In cases of approved TDfrMP or TDfM the EB guidance has been applied as follows:</i></p> <p><i>Detailed description and justification each TDfrMP or TDfM for which appendix 1 is applicable:</i></p> <p>In this context the following findings have been identified: N/A</p>																
<p>B.2.3. Corrections <i>(EB 70, Annex 11, B.2.2; EB70, Annex 3; §§ 257 - 259)</i></p> <p><i>Indicate whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.</i></p> <p><i>In cases where the correction(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.</i></p> <p><i>Please check and report that the corrected information is an accurate reflection of the actual</i></p>		<table><tr><td><input checked="" type="checkbox"/></td><td colspan="3">During the verification of the current MP no need for corrections has been identified.</td></tr><tr><td rowspan="3"><input type="checkbox"/></td><td colspan="3">The following corrections have been applied:</td></tr><tr><td>1</td><td>Issue:</td><td></td></tr><tr><td>2</td><td>Issue:</td><td></td></tr></table> <p><i>Detailed description and justification each correction:</i></p>	<input checked="" type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.			<input type="checkbox"/>	The following corrections have been applied:			1	Issue:		2	Issue:		OK	OK
<input checked="" type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.																	
<input type="checkbox"/>	The following corrections have been applied:																	
	1	Issue:																
	2	Issue:																

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																																		
<i>project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.</i>		In this context the following findings have been identified: N/A																																				
B.2.4. Permanent changes from the registered monitoring plan or applied methodology (PCfrMP; PCfMM) <i>(EB 70, Annex 11, B.2.3; EB70, Annex 3; §§ 262 - 268)</i> <i>Indicate whether any permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report.</i> <i>In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.</i>		<table><tr><td><input type="checkbox"/></td><td colspan="3">No PCfrMP or PCfMM have been submitted to the UNFCCC prior to the current monitoring period</td></tr><tr><td rowspan="5"><input checked="" type="checkbox"/></td><td colspan="3">The following PCfrMP or PCfMM have been approved or are under approval by the UNFCCC</td></tr><tr><td rowspan="4">1</td><td>Title</td><td>N2O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India</td></tr><tr><td>Status</td><td><input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved</td></tr><tr><td>Appr.date</td><td>15-11-2012</td></tr><tr><td>Ref. No.</td><td>CDM No: 2792</td></tr><tr><td rowspan="4">2</td><td>Title</td><td></td></tr><tr><td>Status</td><td><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td></tr><tr><td>Appr.date</td><td></td></tr><tr><td>Ref.No.</td><td></td></tr><tr><td><input type="checkbox"/></td><td colspan="3">During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA</td></tr><tr><td><input type="checkbox"/></td><td colspan="3">An approval of the following PCfrMP or PCfMM is to be</td></tr></table>	<input type="checkbox"/>	No PCfrMP or PCfMM have been submitted to the UNFCCC prior to the current monitoring period			<input checked="" type="checkbox"/>	The following PCfrMP or PCfMM have been approved or are under approval by the UNFCCC			1	Title	N2O abatement in HP Nitric Acid plants at Rashtriya Chemicals & Fertilizers Limited, India	Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved	Appr.date	15-11-2012	Ref. No.	CDM No: 2792	2	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved	Appr.date		Ref.No.		<input type="checkbox"/>	During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA			<input type="checkbox"/>	An approval of the following PCfrMP or PCfMM is to be			OK	OK
<input type="checkbox"/>	No PCfrMP or PCfMM have been submitted to the UNFCCC prior to the current monitoring period																																					
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Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																		
		<table><tr><td></td><td colspan="2">requested from the EB for the current MP as appendix 1 of the project standard does not apply.</td></tr><tr><td>1</td><td>Issue:</td><td></td></tr><tr><td>2</td><td>Issue:</td><td></td></tr><tr><td><input type="checkbox"/></td><td colspan="2">The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied:</td></tr><tr><td>1</td><td>Issue:</td><td></td></tr><tr><td>2</td><td>Issue:</td><td></td></tr></table> <p><i>In cases of approved PCfrMP or PCfMM the EB guidance has been applied as follows:</i></p> <p><i>Detailed description and justification each TDfrMP or TDfM for which appendix 1 is applicable:</i></p> <p>In this context the following findings have been identified: N/A</p>		requested from the EB for the current MP as appendix 1 of the project standard does not apply.		1	Issue:		2	Issue:		<input type="checkbox"/>	The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied:		1	Issue:		2	Issue:			
	requested from the EB for the current MP as appendix 1 of the project standard does not apply.																					
1	Issue:																					
2	Issue:																					
<input type="checkbox"/>	The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied:																					
1	Issue:																					
2	Issue:																					
B.2.5. Changes to the project design of the registered project activity																						

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(CoPD) (EB 70, Annex 11, B.2.4; EB70, Annex 3; §§ 269 - 282)</p> <p><i>Indicate whether any changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report.</i></p> <p><i>In cases where the change(s) and the revised PDD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised PDD.</i></p>		<input checked="" type="checkbox"/> No CoPD has been submitted to the UNFCCC prior to the current monitoring period	OK	OK
		<input type="checkbox"/> The following CoPD has been approved or are under approval by the UNFCCC		
		1 Title		
		Status <input type="checkbox"/> under approval; <input type="checkbox"/> approved		
		Appr.date		
		Ref. No.		
		2 Title		
		Status <input type="checkbox"/> under approval; <input type="checkbox"/> approved		
		Appr.date		
		Ref.No.		
		<input type="checkbox"/> During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
		<input type="checkbox"/> An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
		1 Issue:		
		2 Issue:		
		<input type="checkbox"/> The following CoPD for which appendix 1 of the PS is applicable have been applied:		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.								
		<table><tr><td></td><td>1</td><td>Issue:</td><td></td></tr><tr><td></td><td>2</td><td>Issue:</td><td></td></tr></table>		1	Issue:			2	Issue:				
	1	Issue:											
	2	Issue:											
		<p><i>In cases of approved CoPD the EB guidance has been applied as follows:</i></p> <p><i>Detailed description and justification each CoPD for which appendix 1 of the CDM Project Standard is applicable:</i></p> <p>In this context the following findings have been identified: N/A</p>											
C. Description of monitoring system													
<p>C.1. Monitoring Plan – PDD Compliance (EB 70 Annex 3, §§ 233-236)</p> <p><i>Check if the monitoring plan is in accordance with the monitoring plan contained in the registered PDD (or any accepted revised MP).</i></p> <p><i>Please check esp. if</i></p> <ul style="list-style-type: none"><i>all parameters stated in the MP of the registered PDD have been monitored and updated as applicable</i>	/MR/ /PDD/	<p>By means of comparison of the MR with the registered PDD (or any revisions thereof) the verification team has checked whether the MP is in compliance with the registered PDD. The outcome is as follows:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>The MP is completely in accordance with the last approved version of the MP.</td></tr></table> <p>In this context the following findings have been identified: N/A</p>	<input checked="" type="checkbox"/>	The MP is completely in accordance with the last approved version of the MP.	OK	OK							
<input checked="" type="checkbox"/>	The MP is completely in accordance with the last approved version of the MP.												

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.																				
<ul style="list-style-type: none">- the monitoring equipment has been controlled and calibrated as per the MP- the monitoring results are consistently recorded as per the approved frequency- QA/QC procedures have been applied in accordance with the MP																								
<p>C.2. Monitoring Plan – Meth Compliance (EB 70 Annex 3, §§ 229-232)</p> <p>Check if the monitoring plan is in accordance with the applied methodology.</p> <p>In case the methodology references applicable tools it has to be ensured that the MP is also compliant with those tools.</p> <p>Also please specify if monitoring aspects have been identified that are not specified in the methodology but may enhance the level of accuracy and completeness of the monitoring plan – this esp. applies for SSC PAs.</p>	<p>/MR/ /PDD/ /AM9/ /T-FFC/ /T-EC/ /T-CAD/</p>	<p>By means of comparison of the MR with the applied CDM methodology and related tools the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology. The outcome is as follows:</p> <table><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)</td></tr><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows:</td></tr><tr><td>1</td><td>Title (of the tool)</td><td colspan="2">Tool for the demonstration and assessment of additionality</td></tr><tr><td></td><td>Version</td><td colspan="2">5.2</td></tr><tr><td></td><td>MP compliance</td><td colspan="2"><input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)</td></tr></table>	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)			<input checked="" type="checkbox"/>	The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows:			1	Title (of the tool)	Tool for the demonstration and assessment of additionality			Version	5.2			MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)		OK	OK
<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)																							
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1	Title (of the tool)	Tool for the demonstration and assessment of additionality																						
	Version	5.2																						
	MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)																						

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>In this context the following findings have been identified:</p> <p>Regarding aspects that are not specified in the methodology the following issues have been identified which may enhance the level of accuracy and completeness of the MP:</p> <p>N/A</p>		
<p>C.3. Management System (EB 70 Annex 3, § 217 (iii))</p> <p><i>Check if the GHG data monitoring system can be assessed as appropriate.</i></p> <p><i>In case reference is made to a (certified) company quality management system, check if all CDM related monitoring procedures have been fully integrated in the project participant's quality management system.</i></p> <p><i>In case of a stand-alone system, check how the GHG management system has been implemented and effectiveness is ensured.</i></p>	/ISO/	<p><i>Description:</i></p> <p>RCF is an ISO 9001 certified company, a separate CDM team has been appointed and all the equipments/instruments used in the CDM project are also included as a part of ISO procedures. However during the verification it was observed that the calibration details indicate that accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated, thus the appropriateness of the calibration process is questionable. Further the implications of this fact need to be evaluated considering the requirements under EB 52 annex 60 (also according EB 70 annex 3 para 238 (a)).</p> <p><i>Verifier's action:</i></p> <p>The data handling and recording procedures were discussed with the plant personnel also the ISO certificate was cross-checked to confirm the management systems.</p> <p><i>Conclusion:</i></p> <p>The management systems for CDM has been integrated in the Quality management system.</p> <p>Nevertheless the following findings were relevant: CAR C1</p>	<p>CAR C1</p> <p>CAR B3</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		related the lower accuracy of master calibrator instrument. Furthermore CAR B3 was raised because EN 14181 requirements under QAL3 are not fully implemented.		
C.4. Metering diagram (EB 70, Annex 11, C; EB 70 Annex 2 §193) <i>Check first if the MR includes a metering diagram showing all relevant monitoring points.</i> <i>Check further if this diagram reflects the actual situation and is in line with the registered PDD and with the requirements of the applied methodology.</i>	/ISO/	<i>Description:</i> The metering for the project has been described covering all the metering points. <i>Verifier's action:</i> The metering points have been confirmed during the site visit. <i>Conclusion:</i> The metering positions are implemented.	OK	OK
C.5. Roles and Responsibilities (EB 70, Annex 11, C; EB 70 Annex 2 §193) <i>Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented as stated in the monitoring plan. Please consider the complete data trail from raw data generation to submission of the final data.</i> <i>Identify, if relevant personnel w.r.t. monitoring has been exchanged?</i> <i>If so, have appropriate training measures been carried out.</i> <i>In case of changes, assure that the implemented monitoring procedures have not been affected.</i>	/ISO/ /ORG/	<i>Description:</i> The roles and responsibility for the project is clearly defined, a separate CDM team has been formed at corporate level which looks into the aspects of the project beyond operational requirements. <i>Verifier's action:</i> RCF is ISO certified, further during the interview with the plant personnel, the roles and responsibilities for CDM were clearly demonstrated. <i>Conclusion:</i> The roles and responsibilities of plant personnel were discussed and found acceptable.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>C.6. Emergency procedures for the monitoring system (EB 70 Annex 11, C; EB 70 Annex 2 §193)</p> <p><i>Check, as appropriate, whether relevant emergency procedures for the monitoring system have been included in the MR and assess whether these procedures have been implemented, when required</i></p>	/BR/	<p><i>Description:</i></p> <p>Emergency procedures for monitoring have been implemented, However, the description in the respective parameter tables for parameters fixed ex ante are incorrect.</p> <p>The substitute value strategy for other parameter has been detailed.</p> <p><i>Verifier's action:</i></p> <p>The downtimes of the plant have been checked and the corresponding troubleshooting measures have been analyzed.</p> <p><i>Conclusion:</i></p> <p>The emergency procedures are established for parameters expect for Pending CAR C2</p>	CAR C2	OK
<p>C.7. Data archive and data protection (EB 70 Annex 2 §56 b)</p> <p>Check whether all records of monitoring parameters are archived according to the monitoring plan.</p> <p>Assess further whether appropriate measures have been taken in order to avoid unintended or intended manipulation or loss of the measured data.</p>	/IM01/, /TS/	<p><i>Description:</i></p> <p>The data in the CEM is recorded in the soft copy, while the other hard copies of the documents shall be kept of two year after the crediting period or issuance of CERs whichever is later.</p> <p>However during the verification site visit it was found that the backup hard disk connected to CEM system is currently not in operation. Thus CAR B2 has been raised.</p> <p><i>Verifier's action:</i></p> <p>The archiving procedure was checked for the CEM system and all the data for the parameters is available since the installation of the CEM system. The other documents for CDM are archived in hard copies and have been cross-checked.</p>	CAR B2	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Conclusion:</i></p> <p>The data archiving procedure is assessed to be appropriate and in line with the requirements of the registered PDD.</p> <p>However the data protection is observed not to be in line with the PPD, thus CAR B2 has been raised.</p>		
D. Data and parameters				
D.1. Data and Parameters fixed ex ante				
<p>a) Compliance with registered PDD (EB 70 Annex 11; D1) <i>Check whether the value applied is in compliance with the registered PDD.</i></p>	/PDD/	<p><i>Description:</i></p> <p>The parameters fixed ex ante are in compliance to the values as per the registered PDD.</p> <p><i>Verifier's action:</i></p> <p>The values have checked and confirmed with the registered PDD.</p> <p><i>Conclusion:</i></p> <p>The ex ante fixed values is in compliance to the registered PDD.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Compliance with the applied methodology (EB 70 Annex 11; D1) <i>Check whether the value applied is in compliance with the applied methodology or any other tool.</i>	/PDD/	<i>Description:</i> The ex ante fixed parameter includes the baseline emission factor which has been computed in line with the applied methodology. <i>Verifier's action:</i> The parameters fixed ex ante are computed as per the applied methodology. <i>Conclusion:</i> The ex ante fixed values are in compliance to the registered PDD, values applied are in compliance with the applied methodology.	OK	OK
D.2. Data and Parameters monitored				
D.2.1. NCSG (mgN₂O/m³)		Description: N ₂ O concentration in the stack gas		
a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236) <i>Describe how the monitoring parameter was measured / determined.</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination</i>	/IM01/ /PDD/	<i>Description:</i> This parameter is measured through an ABB AO2000 URAS 26 continuous NDIR industrial photometer. Measurements are taken continuously and recorded by CEM every second. Based on the per second data, average values are calculated for every hour, the hourly values are used for statistical analysis (95% confidence level) based on which the values outside the permitted range is discarded. No changes on the measurement device have been identified since the implementation of this device.	CAR-B3 CAR-B4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		<p>During the downtime of the CEM system the highest value observed during the monitoring period has been applied. The approach is conservative and in-line with AM0034.</p> <p>However, the accuracy for the parameter is not in accordance to the QAL 2 report, thus CAR D1 has been raised, covering this issue along with other similar issues for the other parameters.</p> <p><i>Verifier's action:</i></p> <p>The monitoring of the parameter was discussed with the plant personnel and also tested under the QAL 2 Test and AST. The specification of instrument has been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p><i>Conclusion:</i></p> <p>The monitoring of the parameter is as per the registered monitoring plan. Nevertheless it was observed, that QAL 3 procedures are not fully implemented (CAR B3). Furthermore further clarification is requested related the exclusion of values during plant shutdowns and start ups(CAR B4) and the correct use of the permitted range as per PDD (CAR D6)</p> <p>The finding related the accuracy is also relevant (CAR D1)</p>	CAR D1, CAR D6	
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance</i></p>	/CAL/	<p><i>Description:</i></p> <p>The supplier for the equipment is ABB, and the analyser was tested as per QAL 2 tested by TÜV Sud, Germany, the uncertainty of measurement for N₂O monitoring is reported as 4.52%, while the accuracy of the N₂O analyser is 3.44%.</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>		<p>Calibration frequency of the N₂O is every 3 months manually, however the N₂O analyser is equipped with auto calibration procedures which carries out weekly calibration based on the QAL 3 procedures. Further Annual Surveillance Test (AST) was carried out in 2010 The result of AST test can be reported as “functional without defects”.</p> <p>Further calibration details under appendix 1 for NCSG does not cover the entire monitoring period, appropriate correction is required thus CAR C2 and CAR D2 are raised.</p> <p><i>Verifier's action:</i></p> <ul style="list-style-type: none"> • The QAL 2 report by TUV SUD, Germany is checked to confirm the uncertainty, while the specifications of analyser is provided by ABB • QAL 3 tests of the analyzer which carries out auto calibration on weekly basis. • analyser characteristics determined during QAL1 • AST tests (2010-2011) <p><i>Conclusion:</i></p> <p>Nevertheless it was observed, that QAL 3 procedures are not fully implemented. Related CAR B3 has been raised.</p> <p>No AST for 2009 was carried out. CAR C2 has been raised.</p> <p>The calibration report described in the MR does not cover the entire monitoring period. Thus CAR D2 has been raised.</p>	<p>CAR B3</p> <p>CAR C2</p> <p>CAR D2</p>	OK
c) Correctness	/MR/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><i>Description:</i></p> <p>The values from the N₂O analyser is directly recorded in the CEM installed at RCF. The monitoring system is installed by ABB, Germany and the same is tested by third party, during QAL2 and AST.</p> <p><i>Verifier's action:</i></p> <p>The QAL 2 report and AST were checked to confirm the same. Furthermore the recording for the parameter and registered monitoring plan were checked.</p> <p><i>Conclusion:</i></p> <p>The monitoring of the parameter is as per the registered monitoring plan, however pending findings are relevant for a conclusion:</p> <p>The calibration report/AST described in the MR does not cover the entire monitoring period (CAR C2 and CAR D2). Furthermore the findings CAR B3, CAR B4, CAR C1, CAR D1, CAR D4, CAR D6 and CAR E1 should be closed before final assessment.</p>	<p>CAR C2</p> <p>CAR D2,</p> <p>CAR B3</p> <p>CAR B4</p> <p>CAR C1</p> <p>CAR D1</p> <p>CAR D4</p> <p>CAR D6</p> <p>CAR E1</p>	OK
D.2.2. VSG (Nm³/h)		Description: Volume flow rate of the stack gas		
<p>a) Measurement / Determination method</p> <p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard</i></p>	/IM01/ /PDD/	<p><i>Description:</i></p> <p>The flow rate is measured based on the pressure-differential technique which continuously monitors the gas flow in the stack. A flow meter from ABB based on the pressure differential technique is installed with serial number (256DS6600028331) the TAG number is F1120400 and the range of measurement is from 0 to 10 mbar.</p>	<p>CAR B4</p> <p>CAR D1</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>The sampling point is located at the height of 20 m in the stack.</p> <p>Recording is carried out every second based on which hourly average values are calculated which are further used for the statistical analysis (95% confidence level) and the values outside the confidence levels are discarded.</p> <p>The flow rate of the stack gas is directly measured and is recorded in the EMI 3000 software via the Data logger.</p> <p>No changes in the stack flow meter is observed during the monitoring period. The substitute value strategy for VSG is not in line with AM0034. As per the meth the highest value within the campaign is to be considered. Within the campaign the data for 2010-05-24 need to be updated accordingly. Furthermore the corresponding descriptions in the MR have to be revised accordingly.</p> <p><i>Verifier's action:</i></p> <p>The manual from the supplier (ABB) is checked in detail, also the monitoring is in line with the requirements of AM0034, as certified by a third party TÜV SÜD, Germany.</p> <p><i>Conclusion:</i></p> <p>The determination of the parameter is in line with the registered monitoring plan. However clarification is requested related the correct use of substitute values (as per methodology) (CAR D3).. Furthermore clarification is requested related the exclusion of values during plant shutdowns and start ups (CAR B4) and the correct use of the permitted range as per PDD (CAR D6)</p> <p>The finding related the accuracy is also relevant (CAR D1).</p>	<p>CAR D3</p> <p>CAR D6</p>	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/CAL/	<p><i>Description:</i></p> <p>The overall uncertainty w.r.t to stack flow monitoring is 2.89% (QAL 2 report section 10.5). The uncertainty in measurement has been considered for calculation of baseline emissions.</p> <p>The instrument accuracies for VSG are incorrect thus CAR D1 is raised, further there is a delay in the calibration for VSG however the procedures as per EB 52 annex 60 (also according EB 70 annex 3 para 238 (a)) are not complied to. In this regard CAR D3 has been raised.</p> <p>The flow meter installed by ABB is of 0.075 accuracy class.</p> <p>The flow meter is under annual calibration as followed by RCF under its ISO 9000 procedure.</p> <p>In addition to annual calibration, the flow meter accuracy testing was a part of the QAL 2 test carried out by third Party TÜV Süd, Germany and AST carried out by SGS Netherland meeting EN14181 standard.</p> <p><i>Verifier's action:</i></p> <p>The internal calibration procedures and documentation as well calibration certificate along with the QAL 2 test report and AST were cross-checked to assess the situation. (The calibration certificate along with the QAL 2 test report from TÜV SÜD, Germany and AST report by SGS, Netherland was cross-checked to confirm the same.)</p> <p><i>Conclusion:</i></p> <p>The planned QA/QC procedures are assessed to be appropriate. The planned calibration for the equipment is as per</p>	<p>CAR C1</p> <p>CAR C2</p> <p>CAR D2</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		the monitoring plan. Nevertheless CAR C1 has been raised related the fact that the accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated. Clarification is requested related the appropriateness of the calibration certificate. Furthermore the AST has not been conducted for 2009 and the implications for the same are missing as well the recommendations of AST 2011 considering revision of constants has not been detailed (CAR C2). Delay in calibration for the parameters of Stack flow (VSG), Stack pressure (PSG) and Stack temperature (TSG) has also been observe.(CAR D2).,		
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /IM01/ /QAL/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The data recording is recorded directly in the CEM system. The CEM system is supplied by ABB and certified by TÜV SÜD, for its compliance to AM0034. The calculation of the parameter is done in ER calculation sheet.</p> <p>The detail description of the parameters are provided, which is in line with the registered monitoring plan. Nevertheless some mistakes and need for clarification were observed in the determination of VSG.</p> <p><i>Justification of evidences:</i></p> <p>The monitoring of the parameter and the processing of the data were checked during the site visit.</p> <p><i>Conclusion:</i></p> <p>The monitoring of the parameter was found acceptable but the processing of the data is not correct. The value in the MR needs</p>	<p>CAR B3</p> <p>CAR B4</p> <p>CAR C1</p> <p>CAR D1</p> <p>CAR D2</p> <p>CAR D3</p> <p>CAR D4</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		to be corrected. CAR D6 related correct use of permitted range during the determination/calculation of VSG. Further clarification is also requested related the exclusion of values during plant shutdowns and start ups (CAR B4) and the correct use of substitute value (CAR D3). Furthermore the findings CAR B3, CAR C1, CAR D1, CAR D2, CAR D4, and CAR E1 should be closed before final assessment	CAR D6 CAR E1	
D.2.3. OH (Hours)		Description: Operating hours		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/	<p><i>Description:</i></p> <p>The operating hour calculation as described in the PDD is based on the temperature limits of the Reactor.</p> <p>The operating hour for the plant can in principle be monitored by using either of two independent methods: Based on the temperature limits of the Reactor as described in the PDD.</p> <p>The plant is considered operational only when the temperature of the ammonia reactor is $\geq 860^{\circ}\text{C}$. The temperature measurement is at the interval of every second. Or: Based on the ammonia flow to the reactor. The plant is considered to be operational during the ammonia flow is introduced in the pre-heated reactor.</p> <p>The operating hour calculation as described in the PDD is based on the temperature limits of the reactor, however during the site visit it was observed that the operating hours as calculated in the plant are based on the ammonia flow to the reactor. Thus CAR D4 has been raised.</p>	CAR D4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Verifier's action:</i></p> <p>Review of project documentation, process logic implemented at nitric acid plant. The procedures were discussed during the site visit with the plant personnel.</p> <p><i>Conclusion:</i></p> <p>The operating hour calculation as described in the PDD is based on the temperature limits of the Reactor, however during the site visit it was observed that the operating hours as calculated in the plant are based on the ammonia flow to the reactor. Request for revision in MP/deviation from MP is required. Pending CAR D4</p>		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/CAL/	<p><i>Description:</i></p> <p>There are 3 temperature sensors in the reactor and the average value of the two nearest sensors is considered to reach a final value. The monitoring is done at every second. In case of failure of 1 sensor the values from the other two would be considered, however if two sensors fail then the plant would trip automatically.</p> <p>The range of measurement of the temperature sensors are 0-1200 °C. The temperature indicator is calibrated annually by the PP according their procedures.</p> <p>It should be noticed that the operating hour calculation as described in the PDD is based on the temperature limits of the reactor, however during the site visit it was observed that the operating hours as calculated in the plant are based on the ammonia flow to the reactor. Request for revision in MP/deviation from MP is required.</p>	<p>CAR C1</p> <p>CAR D4</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>Justification of evidences:</p> <p>The calibration certificates and procedures were cross-checked to confirm the same. The accuracy in measurement is not taken into account for the monitoring system.</p> <p><i>Verifier's action:</i></p> <p>The related calibration certificates were cross-checked to confirm the same. Review of project documentation, process logic implemented at nitric acid plant has been performed by the verifier. The procedures were discussed during the site visit with the plant personnel. Calibration certificates for OT and Ammonia flow instrumentation were checked.</p> <p><i>Conclusion:</i></p> <p>The calibration for the equipment is as per the monitoring plan. Nevertheless the accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated, Thus the appropriateness of the calibration result is questionable (CAR C1). Nevertheless the monitoring of OH is not in line with the PDD, thus CAR D4 has been raised.</p>		
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative</i></p>	/IM01/ /MR/ /CAL/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The operating hour calculation as described in the PDD is based on the temperature limits of the Reactor, however during the site visit it was observed that the operating hours as calculated in</p>	CAR D4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>the plant are based on the ammonia flow to the reactor.</p> <p><i>Verifier's action:</i></p> <p>Review of project documentation, process logic implemented at nitric acid plant. The procedures were discussed during the site visit with the plant personnel. Calibration certificates for OT and Ammonia flow instrumentation were checked.</p> <p><i>Conclusion:</i> The monitoring of OH is not in line with the PDD, thus CAR D4 has been raised</p>		
D.2.4. NAP (tHNO₃)		Description: Nitric Acid (As 100%)		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /TS/ /CHART/	<p><i>Description:</i></p> <p>The total Nitric acid production is calculated based on the flow and concentration of nitric acid.</p> <p>The flow of nitric acid product is measured by a mass flow meter of make "Emerson process management" which is based on coriolis principle.</p> <p>The tag number of the flow meter is FI10121 and the serial number of the sensor is 12031565. The accuracy of the instrument is 0.1%. The range of the measurement is 0 - 40 t/hr</p> <p>The flow of nitric acid in monitored in the CEM system. Recording is for every seconds and daily average values are used.</p> <p>The dilute nitric acid concentration is measured at plant. Shift wise calculations are carried out and average value of the day is used for calculation.</p>	CAR D5	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>The concentration is determined by the specific gravity and temperature of the product nitric acid. The conversion chart from temperature and specific gravity to concentration is from Perry handbook of Chemical Engineers.</p> <p>However, the daily average value calculations for HNO₃ concentrations in the original file (HP conc. Data) are not correct as the zero values in the file lead to wrong average values calculated.</p> <p><i>Verifier's action:</i></p> <p>During the site visit the existence of the above mentioned equipment have been confirmed. The specification has been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p><i>Conclusion:</i></p> <p>The monitoring of NAP is in line with the registered monitoring plan, however CAR D5 has been raised related mistakes in the daily average value calculations for HNO₃ concentrations.</p>		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p>	/CAL/ /MM/	<p><i>Description:</i></p> <p>The tag number of the flow meter is FI10121 and the serial number of the sensor is 12031565. The accuracy of the instrument is 0.1%. The range of the measurement is 0 - 40 t/hr</p> <p>The instrument accuracy for the parameter NAP is stated as 0.1% however this value reflects the accuracy of mass flow measurement only as per manufacturer's specification. The NAP value is calculated based on the mass flow and the acid concentration both, appropriate corrections are required. Thus</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>		<p>CAR D1 is raised.</p> <p>Calibration of flow meter is once in three years as per OEM recommendation.</p> <p>The same is in line with the registered monitoring plan.</p> <p>The calibration of hydrometer and thermometer is as per ISO 9001 procedures. The frequency is detailed as follows;</p> <p>Hydrometer – 6 months</p> <p>Thermometer – 1 year.</p> <p>The calibrations for the hydrometer and Thermometer are carried out by RCF and are traceable to National standards.</p> <p><i>Verifier's action:</i></p> <p>The calibration documents, reports and certificates were checked. The specification has been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p><i>Conclusion:</i></p> <p>Calibration details are not provided so far for the entire monitoring period, thus CAR D1 and CAR D5 has been raised.</p>	<p>CAR D1</p> <p>CAR D5</p>	OK
<p>c) Correctness</p> <p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative</i></p>	/MR/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The MR describes the calculation of the parameter, which is in line with the registered monitoring plan. However pending CAR D1</p>	CAR D1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable.</p> <p><i>Conclusion:</i></p> <p>CAR D1 has been raised related mistakes in the daily average value calculations for HNO₃ concentrations. For a final assessment CAR D1 should be closed. The monitoring of this parameter seems to be correct.</p>		
D.2.5. TSG (Deg C)		Description: Temperature of stack gas		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /TS/	<p><i>Description:</i></p> <p>The temperature of stack gas is measured at the sampling point located at a height of 20 m in the stack by RTD (PT 100) temperature meter. The tag number is TI12040. The range of measurement is 0-250 degree C.</p> <p>The temperature of the stack gas is measured by the CEM system at an interval of every 1 second.</p> <p>The value is used only for conversion of the stack gas readings from m³ to Nm³.</p> <p>The data is recorded directly in the CEM system.</p> <p><i>Verifier's action:</i></p> <p>The monitoring system is supplied by ABB and is in compliance to AM0034. The specification has been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Conclusion:</i></p> <p>The determination method is in line with the registered monitoring plan.</p>		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/CAL/ /MM/	<p><i>Description:</i></p> <p>The uncertainty in the temperature measurement at detailed in the QAL 2 report is 1.65%. The uncertainty of measurement is already a part in baseline emission calculations.</p> <p>Calibration frequency is once in a year. The testing for the instrument was a part in QAL 2 carried by TÜV SÜD, Germany and the AST carried out by SGS, Netherland. Both the tests confirms the compliance to EN14181 as per the requirements under AM0034.</p> <p>The calibration of the temperature sensor is as per ISO 9001 procedures followed in the plant.</p> <p>As per calibration plan of RCF annual calibration of the temperature sensor shall be carried out beside the requested QAL2 and AST. The traceability of the calibration is till NABL standard,</p> <p><i>Verifier's action:</i></p> <p>The QAL 2 test report is cross-checked to confirm the uncertainty of the parameter.</p> <p>The calibration reports are checked along with the QAL 2 test report and AST.</p> <p><i>Conclusion:</i></p>	<p>CAR G1</p> <p>CAR G2</p> <p>CAR D2</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		It was found that the accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated, Thus the appropriateness of the calibration result is questionable (CAR C1). Furthermore the AST has not been conducted for 2009 (CAR C2). Delay in calibration for the parameters of Stack flow (VSG), Stack pressure (PSG) and Stack temperature (TSG) has also been observe(CAR D2).		
c) Correctness (EB 70 Annex 3, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The data recording is recorded directly in the CEM system. The CEM system is supplied by ABB and certified by TÜV SÜD, for its compliance to AM0034. The processing of the parameter is done in CEM system. <i>Verifier's action:</i> The monitoring of the parameter and the processing of the data were checked during the site visit. The procedure was discussed during the site visit with the plant personnel and found acceptable. <i>Conclusion:</i> For a final assessment CAR C1, CAR C2 and CAR D2 should be closed. The monitoring of this parameter seems to be correct.	CAR C1 CAR C2 CAR D2	OK
D.2.6. PSG (hPa)		Description: Pressure of stack gas		
a) Measurement / Determination method	/IM01/	<i>Description:</i>	OK	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/PDD/ /QAL/	<p>The pressure transmitter is located at the sampling point in the stack at a height of 20 m, the tag number is PI 12040 and the serial number of the meter is 1198949. The make of the instrument is Afriso. The meter is based on pressure differential principle. The range of measurement is 0-1.6 bar absolute.</p> <p>The data is monitored at an interval of every 1 second. The data is used only for conversion from m³ to Nm³. The data is recorded directly in the CEM system.</p> <p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable. Also the QAL 2 test report by TÜV Sud, Germany certifies the compliance of the monitoring system as per AM0034.</p> <p><i>Conclusion:</i></p> <p>The parameter is determined in accordance with the registered monitoring plan.</p>		OK
<p>b) Accuracy and QA/QC Procedure</p> <p>(EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the</i></p>	/CAL/ /QAL/	<p><i>Description:</i></p> <p>The uncertainty of measurement as detailed in the QAL 2 report is 1.11%. The calculation of baseline emissions takes into account the uncertainty of measurement.</p> <p>Calibration is as per ISO 9001 procedure followed in the plant. As per calibration plan of RCF annual calibration of the pressure sensor shall be carried out beside the requested QAL2 and AST. The traceability of the calibration is till NABL standard,</p>	<p>CAR C1</p> <p>CAR C2</p> <p>CAR D2</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>monitoring equipment has been carried out in line with the latest EB guidance.</i>		<p>The QAL 2 test report is cross-checked to confirm the uncertainty of the parameter.</p> <p>The calibration reports are checked along with the QAL 2 test report and AST.</p> <p><i>Conclusion:</i></p> <p>It was found that the accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated. Thus the appropriateness of the calibration result is questionable.(CAR C1)</p> <p>Furthermore the AST has not been conducted for 2009 (CAR C2). Delay in calibration for the parameters of Stack flow (VSG), Stack pressure (PSG) and Stack temperature (TSG) has also been observed (CAR D2).</p>		
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The data recording is recorded directly in the CEM system. The CEM system is supplied by ABB and certified by TÜV SÜD, for its compliance to AM0034. The processing of the parameter is done in CEM system. The value in the Monitoring report is measured at every 1 second which is in compliance of the methodology.</p> <p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable.</p>	<p>CAR C1</p> <p>CAR C2</p> <p>CAR D2</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Conclusion:</i></p> <p>For a final assessment CAR C1, CAR C2 and CAR D2 should be closed. The monitoring of this parameter seems to be correct.</p>		
D.2.7. AFR (Kg NH₃/h)		Description: Ammonia gas flow rate to AOR		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/	<p><i>Description:</i></p> <p>The ammonia flow meter is based on differential pressure measurement principle. The sensors are located just before the reactor. The reading is taken at an interval of every 1 seconds.</p> <p>The tag number of the meters are FT 20211A, FT 20211B and FT 20211C. The serial numbers are S198744/45/46 respectively.</p> <p>The differential pressure range of this instrument is 0-2500 mmWC.</p> <p>The parameter is ammonia gas flow to the reactor which is monitored in the DCS for plant performance; however the same is also stored in the CEM.</p> <p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable.</p> <p><i>Conclusion:</i></p> <p>The determination of the parameter is as per the registered monitoring plan.</p>	OK	OK
b) Accuracy and QA/QC Procedure	/CAL/ /QAL/	<i>Description:</i>	CAR	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>		<p>There are 3 measurements for the AFR and the average of the two closer values is considered. In case of failure of one meter the readings from the other two would be considered, however in case if two meter fails the plant would trip.</p> <p>The accuracy of the meter is 0.075, however the MR mentions a different accuracy, thus CAR D1 has been raised.</p> <p>The calibration of the flow meter is performed by the PP RCF as per internal ISO 9000 procedure, followed in the plant. The calibration frequency is annual. The calibration reports are traceable to NABL.</p> <p><i>Verifier's action:</i></p> <p>The calibration reports and technical documentation are cross-checked to confirm the accuracy of the measurements. The measurement principle was discussed during the site visit with the plant personnel. The specification of the instruments have been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p><i>Conclusion:</i></p> <p>The accuracy of the instrument is wrongly described in the MR, thus CAR D1 has been raised. Furthermore CAR C1 is raised as the accuracy of the master calibrator is lower than the accuracy of the equipment.</p> <p>The planned QA/QC procedures are assessed to be appropriate.</p>	<p>C1</p> <p>CAR</p> <p>D1</p>	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The parameter is determined as per the registered monitoring plan. The data recording is recorded directly in the CEM system. The CEM system is supplied by ABB and certified by TÜV SÜD, for its compliance to AM0034. The processing of the parameter is done in CEM system.</p> <p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable.</p> <p><i>Conclusion:</i></p> <p>For a final assessment CAR C1 and CAR D1 should be closed. The monitoring of this parameter seems to be correct. The monitoring system is in line with registered monitoring plan.</p>	CAR C1 CAR D1	OK
D.2.8. UNC (%)		Description: Overall measurement uncertainty of the monitoring system		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p>	/IM01/ /PDD/ /QAL/	<p><i>Description:</i></p> <p>The overall uncertainty for the monitoring system is calculated by third party TÜV Süd following the EN14181 guidelines. The report is referred as QAL 2 report.</p> <p>The measurement uncertainty is 4.52%.</p> <p>The frequency of measurement is once after the monitoring system is commissioned. The value is the same as specified in the registered PDD.</p> <p><i>Verifier's action:</i></p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		The QAL 2 Test report by TÜV SÜD, Germany is cross-checked to confirm the same. <i>Conclusion:</i> The parameter is in line with the value in the registered PDD.		
b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>	/CAL/ /QAL/	<i>Description:</i> The overall uncertainty of the measuring system is assessed to be 4.52%. The uncertainty has to be carried out only once after the commissioning thus it would not be carried out in future. The overall uncertainty is considered in the emission reduction calculations. It is by a third party TÜV Süd, Germany following the EN14181 criteria as specified by the methodology. The value is as per the registered PDD. <i>Verifier's action:</i> The QAL 2 test report has been checked to confirm the values and the QALity procedures confirm to EN14181. <i>Conclusion:</i> The emission reductions are based on conservative assumptions. The QA/QC procedures are assessed to be appropriate.	OK	OK
c) Correctness	/MR/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/IM01/ /MR/ /QAL/	<p><i>Description:</i></p> <p>It is by a third party TÜV Sud, Germany following the EN14181 criteria as specified by the methodology. The value is also mentioned in the registered PDD.</p> <p><i>Verifier's action:</i></p> <p>The value has been cross-checked with the registered PDD and QAL 2 test report and found matching.</p> <p><i>Conclusion:</i></p> <p>The value in the monitoring report is correct.</p>	OK	OK
D.2.9. AIFR		Description: Ammonia to Air ratio		
<p>a) Measurement / Determination method</p> <p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /DCS/	<p><i>Description:</i></p> <p>Ammonia flow is recorded in the DCS, air flow is also recorded in the DCS, based on the two the ratio is calculated in the CEM system for every seconds and hourly average is recorded in the CEM system.</p> <p>There is no change in the monitoring equipment.</p> <p>The flow meter is based on the principle of Differential pressure; the range of measurement is 0-400 mmWC for air flow while the Ammonia flow is already detailed under the parameter 4.7. The parameter is determined as per the registered monitoring plan.</p> <p>The tag numbers for the meters are FT 120211A/B/C while the serial numbers of the air flow meters are S198744 /45 /46 respectively.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable.</p> <p><i>Conclusion:</i></p> <p>The determination of the parameter is as per the registered monitoring plan.</p>		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/CAL/ /QAL/	<p><i>Description:</i></p> <p>The parameter is a ratio of two measured values, air flow and ammonia flow. The calibration of the related flow meters is performed by the PP RCF as per internal ISO 9000 procedure, The calibration frequency is annual. The calibration reports are traceable to NABL.</p> <p><i>Verifier's action:</i></p> <p>The calibration reports and technical documentation are cross-checked to confirm the accuracy of the measurements. The measurement principle was discussed during the site visit with the plant personnel. The specifications of the instruments have been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p><i>Conclusion:</i></p> <p>The accuracy of the instrument is wrongly described in the MR, thus CAR D1 has been raised. Furthermore CAR C1 is raised as the accuracy of the master calibrator are lower than the accuracy of the equipment.</p>	CAR C1 CAR D1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>The Ammonia flow meter and Air flow meter shall be calibrated as per ISO procedures followed in the Plant The planned QA/QC procedures are assessed to be appropriate. However CAR C1 is raised as the accuracy of the master calibrators is lower than the equipment accuracy.</p> <p>The monitoring system is in line with registered monitoring plan.</p>		
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/IM01/ /MR/ /QAL/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The parameter is determined as per the registered monitoring plan.</p> <p>The air flow meter is based on the principle of differential pressure; the range of measurement is 0-400 mmWC for air flow while the Ammonia flow is already detailed under the parameter 4.7. The parameter is determined as per the registered monitoring plan.</p> <p>The tag numbers for the meters are FT 120211A/B/C while the serial numbers of the air flow meters are S198744 /45 /46 respectively.</p> <p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant personnel and found acceptable.</p> <p><i>Conclusion:</i></p> <p>For a final assessment CAR C1 and CAR D1 should be closed. The monitoring of this parameter seems to be correct. The monitoring system is in line with registered monitoring plan.</p>	<p>CAR C1</p> <p>CAR D1</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
D.2.10. OT_h (Deg C)		Description: Oxidation temperature of each hour		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /QAL/</p>	<p><i>Description:</i></p> <p>The temperature of the reactor is displayed in the DCS from where it is sent to the CEM. The recording is done at every seconds. There are 3 temperature sensors and the average of the two closer values is considered.</p> <p>The details of the temperature sensors are as follows; Make : Rosemount tolerance level 1%. Tag numbers/Serial numbers: 1. TT 120332A/ 199556 2. TT 120333A/ 199558 3. TT 120334A/ 199560</p> <p>The range of measurement is 0-1200 °C. There is no case of equipment failure.</p> <p><i>Verifier's action:</i></p> <p>The determination method and the procedure were discussed during the site visit with the plant personnel and DCS documents were checked.</p> <p><i>Conclusion:</i></p> <p>The determination of the parameter is as per the registered</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		monitoring plan.		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/IM01/ /MR/ /QAL/	<p><i>Description:</i></p> <p>The tolerance level is 1%. The equipment is calibrated appropriately, no inaccuracy is observed.</p> <p>The temperature meter is calibrated as per ISO procedures followed in the Plant. The calibration frequency is annual. The calibration records are traceable to NABL. However CAR C1 is raised as the accuracy of the master calibrators is lower than the equipment accuracy.</p> <p><i>Verifier's action:</i></p> <p>The measurement principle was discussed during the site visit with the plant personnel. The specification of the instruments has been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p>The calibration records (dated 18/08/2009) were checked</p> <p><i>Conclusion:</i></p> <p>The calibration for the equipment is as per the monitoring plan. Nevertheless the accuracy of the master calibrator/instruments is lower than the accuracy for the instrument being calibrated. Thus the appropriateness of the calibration result is questionable(CAR C1).</p>	CAR C1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/IM01/ /MR/ /QAL/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The parameter is determined as per the registered monitoring plan.</p> <p><i>Verifier's action:</i></p> <p>The procedure and calculation were discussed during the site visit with the plant personnel and checked with the requirements.</p> <p><i>Conclusion:</i></p> <p>The monitoring system is in line with registered monitoring plan and the parameter is measured and determined correctly. Nevertheless CAR C1 is relevant and should be closed before final assessment.</p>	CAR C1	OK
D.2.11. OP_h (kPa)		Description: Oxidation pressure of each hour		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the</i></p>	/IM01/ /PDD/ /QAL/	<p><i>Description:</i></p> <p>The Oxidation pressure of the ammonia is recorded in the CEM. The recording is done every second and hourly average values are used. The details of the temperature sensors are as follows; Make: Emerson, tolerance level 1%; Tag numbers/Serial numbers: PT 120212 A/B/C.</p> <p><i>Verifier's action:</i></p> <p>The procedure was discussed during the site visit with the plant</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>personnel and found acceptable.</p> <p><i>Conclusion:</i> The determination of the parameter is as per the registered monitoring plan.</p>		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/CAL/ /QAL/	<p><i>Description:</i></p> <p>The equipment is calibrated appropriately, no inaccuracy is observed. However CAR C1 is raised as the accuracy of the master calibrators are lower than the equipment accuracy.</p> <p>The accuracy of the pressure transmitter is mentioned wrongly in the MR, thus CAR D1 has been raised</p> <p>The pressure meter is calibrated as per ISO procedures followed in the plant. The calibration frequency is annual. The calibration records are traceable to NABL.</p> <p><i>Verifier's action:</i></p> <p>The measurement principle was discussed during the site visit with the plant personnel. The specification of the instruments has been cross-checked with the supplier's manual. Furthermore the procedure for the data monitoring is cross-checked with the operating procedures in the plant.</p> <p>The calibration records have been checked by the verifier.</p> <p><i>Conclusion:</i> The accuracy is high, the monitoring system is in line with</p>	<p>CAR D1</p> <p>CAR C1</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		registered monitoring plan. The planned QA/QC procedures are assessed to be appropriate. However CAR C1 is raised as the accuracy of the master calibrators is lower than the equipment accuracy. The accuracy of the pressure transmitter is mentioned wrongly in the MR (CAR D1).		
c) Correctness (EB 70 Annex 3, §§ 233, 236) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /QAL/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The parameter is determined as per the registered monitoring plan. There is no case of equipment failure. <i>Verifier's action:</i> The procedure was discussed during the site visit with the plant personnel and found acceptable. <i>Conclusion:</i> The monitoring system is in line with registered monitoring plan and the parameter is measured and determined correctly. Nevertheless CAR C1 and CAR D1 are relevant and should be closed before final assessment.	CAR D1 CAR C1	OK
D.2.12. GS_{project}		Description: Gauze Supplier for project campaign		
a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236) <i>Describe how the monitoring parameter was</i>	/IM01/ /PDD/ /LOG/	<i>Description:</i> The Gauze supplier for the project is RCF however the fabrication is done by private vendors.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p><i>Verifier's action:</i></p> <p>The work order from RCF to Ravindra HeraeusPvt. Ltd (RHPL) dated 25/05/2009 is checked and found acceptable.</p> <p><i>Conclusion:</i></p> <p>The determination for the parameter is as per the registered PDD.</p>		
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>	/LOG/	<p><i>Description:</i></p> <p>As the parameter is the name of the supplier thus calibration requirements are not applicable. However the parameter is assessed based on the work order issued by RCF.</p> <p><i>Verifier's action:</i></p> <p>The work order from RCF to Ravindra HeraeusPvt. Ltd (RHPL) dated 25/05/2009 is checked and found acceptable.</p> <p><i>Conclusion:</i></p> <p>The parameter does not have any effect on the emission reduction calculations.</p> <p>The QA/QC procedure is assessed appropriate as per the work order.</p>	OK	OK
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative</i></p>	/IM01/, /MR/, /LOG/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The Gauze supplier for the project is RCF however the fabrication is done by private vendors. No mistakes are</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>identified.</p> <p><i>Verifier's action:</i></p> <p>The work order from RCF to Ravindra Heraeus Pvt. Ltd (RHPL) dated 25/05/2009 is checked and found acceptable.</p> <p><i>Conclusion:</i></p> <p>The determination for the parameter is as per the registered PDD.</p>		
D.2.13. GC_{project}		Description: Gauze Composition during project campaign		
<p>a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /LOG/	<p><i>Description:</i></p> <p>The gauze composition is analysed by Heraeus, Germany dated 2010-01-22.</p> <p>The analysis report mentions the composition of the gauze supplied by RCF. The composition of gauze is as follows;</p> <p>Rhodium: 8%</p> <p>Platinum: 92.00%</p> <p><i>Verifier's action:</i></p> <p>The analysis report by Heraeus, Germany dated 2012-01-22 has been checked to confirm the composition.</p> <p><i>Conclusion:</i></p> <p>The determination for the parameter is as per the registered PDD.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (EB 70 Annex 3, §§ 237-241)</p>	/LOG/	<p><i>Description:</i></p> <p>The value is sourced from the analysis report of a third party</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>		<p>(Heraeus, Germany) which is an ISO 9001 certified company. Strict QA/QC procedures are being followed.</p> <p>Accuracy of the analysis report is assessed appropriate.</p> <p><i>Verifier's action:</i></p> <p>The web-link of the company is cross checked to confirm the applicability of its QA/QC procedures.</p> <p>http://www.heraeus.com/en/home/default.html/</p> <p><i>Conclusion:</i></p> <p>The emission reduction calculations are not directly related to the parameter.</p>		
<p>c) Correctness (EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/IM01/ /MR/ /LOG/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The gauze composition is analysed by Heraeus, Germany, dated 2010-01-22.</p> <p>The analysis report mentions the composition of the gauze supplied by RCF. The composition of gauze is as follows;</p> <p>Rhodium: 8%</p> <p>Platinum: 92.00%</p> <p><i>Verifier's action:</i></p> <p>The analysis report by Heraeus, Germany dated 2010-01-22</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		has been checked to confirm the composition. <i>Conclusion:</i> The determination for the parameter is as per the registered PDD.		
D.2.14. EF_{reg}		Description: Emissions level set by incoming policies or regulations		
a) Measurement / Determination method (EB 70 Annex 3, §§ 233, 236) <i>Describe how the monitoring parameter was measured / determined.</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /SC/	<i>Description:</i> The consent to operate by the Maharashtra Pollution Control Board dated 17/01/2007, valid till 31/10/2011 is checked and the plant is allowed to operate without any legal requirement related to N ₂ O emissions. Government of India does not have any regulation for N ₂ O emissions till date. <i>Verifier's action:</i> The consent to operate for Rashtriya Chemicals & Fertilizers Ltd. is checked and found acceptable. The website for CPCB under the Ambient Air quality standards has been checked and no regulations w.r.t N ₂ O emissions are found. http://cpcb.nic.in/National_Ambient_Air_Quality_Standards.php <i>Conclusion:</i> There are no new regulations in the current monitoring period w.r.t N ₂ O emissions.	OK	OK
b) Accuracy and QA/QC Procedure	/SC/	<i>Description:</i>		OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(EB 70 Annex 3, §§ 237-241)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p>		<p>The parameter refers to monitoring of the new regulations or policies by the government, thus accuracies of equipment and QA/QC procedures are not applicable.</p> <p><i>Justification of evidences:</i></p> <p>The consent to operate for Rashtriya Chemicals & Fertilizers Ltd. is checked and is valid.</p> <p><i>Conclusion:</i></p> <p>Accuracy calculations are not applicable for the parameter. QA/QC procedures are not applicable for the parameter.</p>	OK	
<p>c) Correctness</p> <p>(EB 70 Annex 3, §§ 233, 236)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/IM01/, /MR/, /SC/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The consent to operate by the Maharashtra Pollution Control Board dated 17/01/2007, valid till 31/10/2011 is checked and the plant is allowed to operate without any legal requirement related to N₂O emissions.</p> <p><i>Verifier's action:</i></p> <p>The consent to operate for Rashtriya Chemicals & Fertilizers Ltd. is checked and found acceptable.</p> <p><i>Conclusion:</i></p> <p>The parameter is determined as per the registered PDD. No new regulations in the current monitoring period w.r.t N₂O</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		emissions are identified.		
D.3. Sampling				
<p>a) Implementation of sampling plan (EB70 Annex 11; D3)</p> <p><i>Check whether the PP has applied a sampling approach to determine the monitored values (as per section D.2 above).</i></p> <p><i>If this is the case, please provide an assessment whether the PPs have correctly and sufficiently described the implemented sampling plan including</i></p> <p><i>a) Description of the implemented sampling design</i></p> <p><i>b) Collected data</i></p> <p><i>c) Analysis of collected data</i></p> <p><i>d) Demonstration on whether the required confidence/precision has been met.</i></p>	<p>/PDD/ /MR/</p>	<p><input checked="" type="checkbox"/> No sampling approach has been used by the PP to determine the monitored parameters</p> <p>OR.</p> <p><input type="checkbox"/> A sampling approach has been taken for the following monitored parameter:</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Sampling during verification <i>In case the VT has applied a sampling approach in the course of the verification the approach shall be described for each parameter.</i>	/PDD/ /MR/	<input checked="" type="checkbox"/> No sampling approach has been used by the VT to verify the monitored parameters OR. <input type="checkbox"/> A sampling approach has been applied by the VT for the following monitored parameter: Parameter: Description: Conclusion:	OK	OK
E. Calculation of Emission reductions				
E.1. Traceability (EB 70 Annex 3, §§ 212, 214) <i>Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spreadsheet shall be used. All applied formulae must be visible.</i>	/XLS/	Description: The emission reduction sheet provides the raw data. However, the calculations are not traceable, thus CAR E1 is raised. Verifier's action: The emission reduction sheet is cross checked to confirm the same. Conclusion: The calculations are not traceable, thus CAR E1 is raised.	CAR E1	OK
E.2. Parameter consistency (EB 70 Annex 3, § 214) <i>Assess whether all internal and external parameters</i>	/XLS/	Description: Not all parameters are consistent in the PDD, MR and emission reduction calculation sheet. Furthermore, some parts of the		


Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?</i></p> <p><i>Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure the consistency of notations for all parameters in the PDD, MR, calculation spreadsheet.</i></p>		<p>calculations are not traceable in the emission reduction sheet.</p> <p>.</p> <p><i>Verifier's action:</i> The emission reduction calculation sheet is checked together with MR, PDD and original data from the CEM system.</p> <p><i>Conclusion:</i> Not all parameters are consistent in the PDD, MR and emission reduction calculation sheet (CAR D6). Furthermore some parts of the calculations are not traceable in the emission reduction sheet.(CAR E1) .Other issues related were also identified: The substitute value strategy for VSG is not in line with AM0034. As per the meth the highest value within the campaign is to be considered (CAR D3). The daily average value calculations for HNO₃ concentrations in the original file (HP conc. Data) are not correct as the zero values in the file lead to wrong average values calculated (CAR D5). .</p>	<p>CAR D3</p> <p>CAR D5</p> <p>CAR D6</p> <p>CAR E1</p>	OK
<p>E.3. Correctness of calculation (EB 70 Annex 3, §§ 235-236)</p> <p><i>Check if the applied formulae and methods for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan and / or the approved methodology.</i></p> <p><i>Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.</i></p> <p><i>Check especially that no standard or old values have been used for calculation where calculations based</i></p>	<p>/XLS/ /MR/ /PDD/</p>	<p><i>Description:</i> The emission reduction calculations are complete. The requirements of the registered PDD and monitoring methodology are applied mostly correctly.</p> <p>However, the calculation of the moving average factor is not correct as the value of first campaign factor (EF1) is not as per the pending corrective actions of first periodic verification.</p> <p>.</p> <p><i>Verifier's action:</i> The emission reduction calculation sheet is checked together</p>	<p>CAR D3</p> <p>CAR D5</p> <p>CAR D6</p> <p>CAR E1</p> <p>CAR</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>on up-to-date data is required.</i>		<p>with the methodology MR, PDD and original data from the CEM system.</p> <p><i>Conclusion:</i> Some incorrect values are used in the calculation. The calculations are mostly in line with the registered PDD and monitoring methodology except the following findings: some parameters (permitted range) in the emission reduction calculation sheet are not consistent with the PDD (CAR D6). Furthermore some parts of the calculations are not traceable in the emission reduction sheet (CAR E1). The substitute value strategy for VSG is not in line with AM0034. As per the meth the highest value within the campaign is to be considered (CAR D3). The daily average value calculations for HNO₃ concentrations in the original file (HP conc. Data) are not correct as the zero values in the file lead to wrong average values calculated (CAR D5). The calculation of the moving average factor is not correct as the value of first campaign factor (EF1) is not as per the pending corrective actions of first periodic verification.</p>	E2	
<p>E.4. Emission reductions table (EB 70, Annex 11, E.4)</p> <p><i>Check if the MR includes a summary table of the emission reductions calculation specifying separately</i></p> <ul style="list-style-type: none"> - Total baseline emissions - Total project emissions: - Total leakage 	/MR/	<p><input checked="" type="checkbox"/> The MR includes in section E.4 a summary table of the emission reductions calculation.</p> <p><input checked="" type="checkbox"/> The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.</p> <p><input type="checkbox"/> The values as specified in the ER summary table are correct; no issues have been identified during the verification which require changes in the ER calculation.</p>	<p>CAR D3</p> <p>CAR D5</p> <p>CAR D6</p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>- <i>Total emission reductions.</i></p> <p><i>Assess whether the values are correct or need to be revised as a consequence of issues identified above.</i></p>		<p><input checked="" type="checkbox"/> During the verification issues with impact on the ER calculation have been identified. Thus subject to the closure of above listed findings the summary table in E.4 needs to be revised.</p> <p>In this context the following additional findings have been identified: Some incorrect values are used in the calculation. The calculations are mostly in line with the registered PDD and monitoring methodology except the following findings: some parameters (permitted range) in the emission reduction calculation sheet are not consistent with the PDD (CAR D6). Furthermore some parts of the calculations are not traceable in the emission reduction sheet (CAR E1). The substitute value strategy for VSG is not in line with AM0034. As per the meth the highest value within the campaign is to be considered (CAR D3). The daily average value calculations for HNO₃ concentrations in the original file (HP conc. Data) are not correct as the zero values in the file lead to wrong average values calculated (CAR D5). The calculation of the moving average factor is not correct as the value of first campaign factor (EF1) is not as per the pending corrective actions of first periodic verification.</p>	<p>CAR E1</p> <p>CAR E1</p> <p>CAR E2</p>	
<p>E.5. Comparison with ex-ante determined emission reductions (EB 70, Annex 11, E.5; E.6)</p> <p><i>Check if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD.</i></p> <p><i>Check further whether in case of an increase an</i></p>	<p>/XLS/ /MR/ /PDD/</p>	<p><i>Description:</i></p> <p>The MR provides a comparison of estimated CERs and actual CERs observed during the monitoring period. A decrease in the CERs have been observed.</p> <p><i>Justification of evidences:</i></p> <p>The MR has been checked to confirm the same.</p>	<p>OK</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>appropriate explanation is included in the MR.</i></p> <p><i>Assess in case of a significant increase whether this is due to technical or organisational changes within or outside the control of the PP and – if this is case – whether the PRC have been considered appropriately.</i></p>		<p>Conclusion:</p> <p>The emission reductions in the current monitoring period are lower than the estimates in the PDD.</p>		
<p>E.6. ER during the 1st commitment period and the period from 1 January 2013 onwards (EB 70, Annex 11, E.7)</p> <p><i>Check if the MR includes in chapter E.7 a breakdown of the actual ER into</i></p> <p style="padding-left: 40px;">a) <i>ER up to 2012-12-31 and</i> b) <i>ER from 2013-01-01 onwards</i></p> <p><i>The ERs for each period should be determined as per the actual generation. In cases where this is not possible or a cap has been applied a proportional (time related) approach should be chosen.</i></p>	MR/	<p><input checked="" type="checkbox"/> The MR in section E.7 includes a summary table of the ER breakdown</p> <p style="padding-left: 40px;">a) <i>ER up to 2012-12-31 and</i> b) <i>ER from 2013-01-01 onwards</i></p> <p><input checked="" type="checkbox"/> The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows:</p> <p style="padding-left: 40px;"><input checked="" type="checkbox"/> The ER have completely been generated during the first commitment period</p> <p style="padding-left: 40px;"><input type="checkbox"/> The ERs have completely been generated from 2013-01-01 onwards,</p> <p style="padding-left: 40px;"><input type="checkbox"/> The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards.</p> <p><input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.</p> <p>In this context the following additional findings have been identified:</p> <p>N/A</p>	OK	OK

ANNEX 2: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Rainer Winter


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2016-07-01
Ji	Senior Assessor Technical Reviewer	2016-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2016-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal Energy Generation	
1.2	Renewable Energies	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Tidal
4.1	Cement Sector	
4.3	Iron and Steel	
4.5	Waste Heat Recovery	
4.8	Glass	
5.1	Chemical Process Industries	
9.1	Metal Production	
11.1	Chemical Process Industries	
11.2	GHG Capture and Destruction	
12.1	Chemical Process Industries	
13.1	Waste Handling and Disposal	13.1.1 Waste Management

003 - Rev. 7, Date: 2013-07-02

003_S01-VA060-F20_2012-10-12_rev7.doc S01-VA060-F20 rev3 / 2012-10-25



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Jimmy Sah


SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Lead Assessor	2014-02-03
VCS	Lead Assessor	2014-02-03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

091 – Rev. 1, Date: 2011-07-27

091_S01-F003_2011-07-27_rev1 S01-F003 rev0 / 2010-04-19



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Prasad Jakkaraju

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor	2014-02-02
VCS	Lead Assessor	2014-02-02

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies
2.1	Electricity Distribution

103 – Rev. 0, Date: 2011-03-25

103_S01-F003_2011-03-25_rev0 S01-F003 rev0 / 2010-04-19



Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Mohinder Amarnath B.J.

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2013-06-21
VCS / ISO 14064-2	Lead Assessor	2013-06-21

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation [*]
1.2	Renewable Energies
3.1	Energy Demand
4.1	Cement Sector
4.5	Waste Heat Recovery [*]
13.1	Waste Handling and Disposal

^{*} Limited to validation and verification contracts signed by 17 June 2013

053 - Rev. 2, Date: 2012-11-08

053_S01-VA060-F20_2012-11-08_rev2.doc

S01-VA060-F20 rev3 / 2012-10-25



Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Dirk Speyer

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification) Technical Reviewer	2015-07-10
VCS / ISO 14064-2	Lead Assessor Technical Reviewer	2015-07-10

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
4.4	Refinery
5.1	Chemical Process Industries
11.1	Chemical Process Industries
11.2	GHG Capture and Destruction
12.1	Chemical Process Industries

244 – Rev. 4, Date: 2012-07-11

244_S01-F003_2012-07-11_rev4.doc

S01-F003 rev2 / 2012-04-05



Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Ulrich Walter

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification) Technical Reviewer	2014-12-08
Ji	Lead Assessor Technical Reviewer	2014-12-08
VCS / ISO 14064-2	Lead Assessor Technical Reviewer	2014-12-08

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal Energy Generation	
1.2	Renewable Energies	
2.1	Electricity Distribution	
2.2	Heat Distribution	
3.1	Energy Demand	
5.1	Chemical Process Industries	
11.1	Chemical Process Industries	
12.1	Chemical Process Industries	
13.1	Waste Handling and Disposal	13.1.1 Waste Management 13.1.2 Waste Water Management
13.2	Animal Waste Management	
15.2	Animal Waste Management	

149 – Rev. 4, Date: 2012-02-27

149_S01-F003_2012-02-27_rev4.doc

S01-F003 rev2 / 2012-04-05



Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Dr. Jochen Schubert

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2014-05-11
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2014-05-11

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR INCLUDE SUB-AREAS
1.2	Renewable Energies	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Total
13.1	Waste handling and disposal	13.1.1 Waste management 13.1.2 Waste water management

056 – Rev. 2, Date: 2011-07-29