




**Validation report form for post-registration changes for
CDM project activities
(Version 02.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	<ul style="list-style-type: none"> • Title: Catalytic N₂O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp. • UNFCCC reference number: 0765
Process track	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
Version number of the validation report on PRCs	01.0
Completion date of the validation report on PRCs	20/12/2017
Type(s) of PRCs	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan <input type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation project activities
Version number of PDD to which this report applies	Version 4.2, 18/12/2017
Project participants	CARBON CDM Korea Ltd. Hu-Chems Fine Chemical Corp. RWE Power AG Carbon Climate Protection GmbH
Host Party	Republic of Korea
Applied methodologies and standardized baselines	Applied methodology: ACM0019 version 02.0 (N ₂ O abatement from nitric acid production) No standardized baselines applicable.
Mandatory sectoral scopes linked to the applied methodology	Sectoral scope: 5_Chemical industries

Conditional sectoral scopes linked to the applied methodologies	n/a
Name and UNFCCC reference number of the DOE	Name: Korean Foundation for Quality (KFQ) Reference number: E-0025
Name, position and signature of the approver of the validation report on PRCs	Soon Hong YEOM  Managing Director of Sustainability management institute

SECTION A. Executive summary

Korean Foundation for Quality (KFQ) has performed 35th verification of the CDM project ‘Catalytic N₂O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.’, UNFCCC Registration Ref. No. 0765 for the period from 07/08/2017 to 06/11/2017.

The project is located in Yeosu of the Republic of Korea and the PPs have implemented a project for GHG emission reduction by catalytic N₂O destruction. In this project activity, three EnviNO_x® systems for catalytic reduction and decomposition of NO_x and N₂O additionally to the equipment at the three Nitric Acid Plants manufacturing plants were installed. The project activity reduces the GHG emissions, which would otherwise be released to the atmosphere, if the project was not implemented

There was a post-registration change (corrections) identified in the course of verification for this monitoring period. The correction is in line with Appendix of CDM Project Standard for project activities (ver. 01.0) hence request for approval of correction is submitted under this issuance track.

Validation process

The validation process includes desk review of the ‘corrections’ and other supporting documents. Further, on-site assessments and interviews with those involved in project management and operations are conducted. This is followed by preparation of draft validation report summarizing desk review and on-site inspection findings (i.e. CARs, CLs, and FARs). Upon successful closing of the CARs and CLs raised (if any), the final validation report is prepared. The final report then undergoes a technical review and final approval according to KFQ’s internal quality assurance procedures.

The information presented by the PP was assessed by review of the detailed project documentation as well as interviews with personnel of CARBON CDM Korea Ltd., Hu-Chems Fine Chemical Corp. and Carbon Climate Protection GmbH. This has enabled the validation team to assess and determine that the correction is in compliance with CDM Project standard and relevant guidance provided by the Board.

General description of the project activity and summary of corrections

Project Title	Catalytic N ₂ O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.
UNFCCC Ref. No.	0765
Project Participant	CARBON CDM Korea Ltd. Hu-Chems Fine Chemical Corp. RWE Power AG Carbon Climate Protection GmbH
Location of the project	7-6, Wollae-dong, Yeosu-si, Jeonnam, Republic of Korea - Longitude: 127.743198E - Latitude: 34.848686N
Date of registration	22/01/2007 (renewal date: 05/02/2014)

Registered PDD	Version: 4.1, dated 14/10/2013
Revised PDD	Version: 4.2, dated 18/12/2017
Crediting period	From 22/01/2014 to 21/01/2021
Monitoring period of this verification	From 07/08/2017 to 06/11/2017

During this 35th monitoring period (07/08/2017 to 06/11/2017), there was a post-registration change (correction) identified. There is no change on technology used at each Nitric Acid Production Plants. However, there are correction and/or editorial changes of some information in the parameter tables in the registered PDD. Thus, the PPs revised the PDD (version 4.2, 18/12/2017) by reflecting actual project information

The validation team confirms the PP has corrected the information according to the actual installation in the revised PDD (version 4.2), and the changes do not affect the design of the project activity. The validation team also confirms that corrected information reflects actual project information in line with para. 288 of VVS (ver.01.0).

The corrections are in line with Appendix of CDM Project Standard (ver.01.) hence request for approval of the correction is submitted under this issuance track.

Conclusion

As a result of our assessment, KFQ confirms that the changes described in the revised PDD (ver.4.2) ensure accurate reflection of actual project information.

Hence KFQ recommends for approval of corrections to project information for the project activity 'Catalytic N₂O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.'.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader	IR	LEE	Mi Jung	KFQ	√	√	√	√
2.	Team member	IR	JEONG	Yu Shim	KFQ	√	√	√	√
3.	Team member	IR	CHO	Jin Seok	KFQ	√	√	√	√

B.2. Technical reviewer and approver of the validation report on PRCs

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	PARK	Sang Yeon	KFQ
2	Approver	IR	YEOM	Soon Hong	KFQ

Please refer to Appendix 2 below for demonstration of how the team meets the competence required for the validation.

SECTION C. Means of validation**C.1. Desk/document review**

KFQ's validation is based on the 'Corrections to project information' and other supporting documents provided by the PP. Those were reviewed as initial step of the validation process as for the post registration changes. Also, over the whole validation period, validation team reviewed information and references relevant to the post registration changes. A complete list of all documents reviewed is shown in Appendix 3 of this validation report. KFQ's validation process takes into consideration all the CDM Rules and Guidance applicable to the project activity, e.g. Clean Development Mechanism Validation and Verification Standard, Clean Development Mechanism Project Standard, Clean Development Mechanism Project Cycle Procedure, and relevant decisions, clarifications and guidance from the CMP and the CDM EB.

C.2. On-site inspection

Detailed validation of 'corrections to project information' was performed during the site visit on 06/12/2017. During the on-site assessment, the personnel were interviewed or assisted the validation team.

The main topics of the discussion are summarized in the table below.

Duration of on-site inspection: 06/12/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	Confirm the implementation and operation of the project	Yeosu	06/12/2017	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
2	Review the data flow for generating, aggregating and reporting the monitoring parameters	Same as above	Same as above	Same as above

C.3. Interviews

A list of the persons interviewed during this verification activity is included in table below.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	HAN	Du Hee	Hu-Chems Fine Chemicals Corp	06/12/2017	General support	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
2	LEE	Seunghun	Same as above	06/12/2017	General support, Maintenance	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
3	KIM	Jinsung	Same as above	06/12/2017	Production, Documentation	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
4	BAEK	Jongmin	Same as above	06/12/2017	General support, maintenance	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
5	KIM	Donghyun	Carbon CDM Korea	06/12/2017	CDM Coordination	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
6	Bichler	Sonja	Carbon Climate Protection GmbH	06/12/2017	QA/QC, Calculation, Reporting	Mi Jung LEE Yu Shim JEONG Jin Seok CHO
7	Roshdy	Mahmoud	Carbon Climate Protection GmbH	06/12/2017	General support	Mi Jung LEE Yu Shim JEONG Jin Seok CHO

C.4. Sampling approach

Sampling plan was not considered as all the corrections to the project information in the registered PDD were assessed.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	0	0	0
Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines	n/a	n/a	n/a
Corrections	0	0	0
Changes to the start date of the crediting period	n/a	n/a	n/a
Inclusion of a monitoring plan	n/a	n/a	n/a
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools	n/a	n/a	n/a
Changes to the project design	n/a	n/a	n/a
Changes specific to afforestation and reforestation project activities	n/a	n/a	n/a
Others (please specify)	n/a	n/a	n/a
Total	0	0	0

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	Compliance with PDD form is validated by the document review, review of PDD template and instruction for completing PDD form, review of registered PDD (ver.4.1) and review of revised PDD (ver.4.2).
Findings	The change to the project information of the registered project activity has been observed during document review and on-site visit. The project participants have provided a revised PDD (ver.4.2) inclusive of all post registration changes. The

	project participants used the latest version of the PDD form for the revised PDD. The PP has provided the PDD in VVS track in clean and track change version and same has been checked and found to be correct.
Conclusion	The validation team has reviewed the revised PDD and it is observed that the revised PDD is completed by using the latest form, Project Design Document Form (version 10.1). By means of checking updated PDD with the latest applicable and available PDD template form, the validation team can confirm that the information transferred to the later version of the PDD form is materially the same as that in the registered PDD and those changes are assessed under this report.

D.2. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.3. Corrections

Means of validation	Corrections to the project information have been validated by document review, on-site inspection and review of registered and revised PDD.																										
Findings	<p>There is no change on technology used at each Nitric Acid Production Plants. However, there are correction and/or editorial changes of some information in the parameter tables in the registered PDD.</p> <p>1) Measurement method of moisture content of the gaseous stream at normal condition ($C_{H_2O,t,db,n}$) of Hu-Chems II, III and IV</p> <p>: Since no measurement of the 'moisture content of the gaseous stream at normal condition' was available during the revalidation, project participants had followed the monitoring plan by performing the moisture content measurement during the first calibration of the flowmeter for the gaseous stream after the revalidation or plant start-up (plant 2 & 3 were in permanent shutdown during revalidation process while it is a must that the plant is in operation during the performance of the measurement), which is in accordance with the registered monitoring plan. Furthermore, regular measurements coincide with each QAL2 or annual surveillance test (AST; associated with requirements of the EN 14181 standard). This means the wording 'first' reflects the initial measurements performed during the first QAL 2 after revalidation followed by annual measurements in accordance with the monitoring plan and applied tool. However, the wording 'first' was understood very differently, PP have updated the respective section in the revised PDD v.4.2 in order to make the wording clearer and to reflect the exact wording of the relevant tool.</p> <table border="1"> <thead> <tr> <th></th><th>Registered PDD (ver.4.1)</th><th>Revised PDD (ver.4.2)</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>Data/Parameter</td><td>$C_{H_2O,t,db,n,II}$ $C_{H_2O,t,db,n,III}$ $C_{H_2O,t,db,n,IV}$</td><td>$C_{H_2O,t,db,n,II}$ $C_{H_2O,t,db,n,III}$ $C_{H_2O,t,db,n,IV}$</td><td>No correction</td></tr> <tr> <td>Unit</td><td>mg H₂O/m³ dry gas</td><td>mg H₂O/m³ dry gas</td><td>No correction</td></tr> <tr> <td>Description</td><td>Moisture content of the gaseous stream at normal conditions, in time interval t of Hu-Chems II, III and IV</td><td>Moisture content of the gaseous stream at normal conditions, in time interval t of Hu-Chems II, III and IV</td><td>No correction</td></tr> <tr> <td>Source of data</td><td>Measurements according to the USEPA CF42 method 4 – Gravimetric determination of water content</td><td>Measurements according to the USEPA CF42 method 4 – Gravimetric determination of water content</td><td>No correction</td></tr> <tr> <td>Values applied</td><td>Calculated value for ex-ante determination of</td><td>Calculated value for ex-ante determination of emission</td><td>No correction</td></tr> </tbody> </table>				Registered PDD (ver.4.1)	Revised PDD (ver.4.2)	Remark	Data/Parameter	$C_{H_2O,t,db,n,II}$ $C_{H_2O,t,db,n,III}$ $C_{H_2O,t,db,n,IV}$	$C_{H_2O,t,db,n,II}$ $C_{H_2O,t,db,n,III}$ $C_{H_2O,t,db,n,IV}$	No correction	Unit	mg H ₂ O/m ³ dry gas	mg H ₂ O/m ³ dry gas	No correction	Description	Moisture content of the gaseous stream at normal conditions, in time interval t of Hu-Chems II, III and IV	Moisture content of the gaseous stream at normal conditions, in time interval t of Hu-Chems II, III and IV	No correction	Source of data	Measurements according to the USEPA CF42 method 4 – Gravimetric determination of water content	Measurements according to the USEPA CF42 method 4 – Gravimetric determination of water content	No correction	Values applied	Calculated value for ex-ante determination of	Calculated value for ex-ante determination of emission	No correction
	Registered PDD (ver.4.1)	Revised PDD (ver.4.2)	Remark																								
Data/Parameter	$C_{H_2O,t,db,n,II}$ $C_{H_2O,t,db,n,III}$ $C_{H_2O,t,db,n,IV}$	$C_{H_2O,t,db,n,II}$ $C_{H_2O,t,db,n,III}$ $C_{H_2O,t,db,n,IV}$	No correction																								
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		emission reductions is 7,000 mg H ₂ O/m ³ dry gas (= 0.007 kg H ₂ O/m ³ dry gas).	reductions is 7,000 mg H ₂ O/m ³ dry gas (= 0.007 kg H ₂ O/m ³ dry gas)	
	Measurement procedures (in any)	Discrete measurement procedure The mean value among three consecutive measurements performed in the same day (at least 2 hours each) will be considered. Measurement will coincide with the first Annual Surveillance Test (associated with requirements of the EN 14181 standard) or the first calibration of the flow meter for the gaseous stream. No measurements available at this stage of the project.	Discrete <u>measurement procedure.</u> <u>No measurements available at this stage of the project.</u>	Correction
	Monitoring frequency	Measurement will coincide with the first Annual Surveillance Test (associated with requirements of the EN 14181 standard) or the first calibration of the flow meter for the gaseous stream.	<u>The mean value among three consecutive measurements performed in the same day (at least 2 hours each) shall be considered.</u> <u>Measurements will coincide with the Annual Surveillance Test (associated with requirements of the EN 14181 standard) or the calibration of the flow meter for the gaseous stream.</u>	Correction
	QA/QC procedures	According to the USEPA CF42 method 4	According to the USEPA CF42 method 4	No correction
	Purpose of data	Calculation of project emissions	Calculation of project emissions	No correction
	Additional comment	Option A parameter for proving that the gaseous stream is dry.	Option A parameter for proving that the gaseous stream is dry.	No correction

2) Tag number of temperature transmitter for measuring Nitric acid production of Hu-Chems IV
In the registered PDD, tag number of temperature transmitter for measuring nitric acid production is 323-TT-4-237 but it was updated as 324-TT-4-237 in order to be consistent with the physical temperature transmitter. Nevertheless, it shall be noted that the instrument as mentioned in the MR (manufacturer, technology, etc.) has been in use since the reoperation of the plant and covered the whole MP.

	Registered PDD(ver.4.1)	Revised PDD (ver.4.2)	Remark
Data/Parameter	P _{production,y,IV}	P _{production,y,IV}	No correction

	Unit	t HNO ₃	t HNO ₃	No correction
	Description	Nitric acid produced in year y of Hu-Chems IV	Nitric acid produced in year y of Hu-Chems IV	No correction
	Source of data	Production reports The nitric acid produced is measured according to the installed instruments. The instrument signals as well as the acid concentration are recorded in the control room, the DCS generates daily reports including the daily nitric acid production (recorded as 100% nitric acid).	Production reports The nitric acid produced is measured according to the installed instruments. The instrument signals as well as the acid concentration are recorded in the control room, the DCS generates daily reports including the daily nitric acid production (recorded as 100% nitric acid).	No correction
	Measurement procedures (in any)	324-FT-4-609 • Type: Flowmeter • Accuracy class: ± 0.35% • Calibration frequency: 60 months <u>323-TT-4-237</u> • Type: Temperature Transmitter • Accuracy class: ± 0.15% of span • Calibration frequency: 48 months	324-FT-4-609 • Type: Flowmeter • Accuracy class: ± 0.35% • Calibration frequency: 60 months <u>324-TT-4-237</u> • Type: Temperature Transmitter • Accuracy class: ± 0.15% of span • Calibration frequency: 48 months	No Correction Correction (323-TT-4-237 is changed to 324-TT-4-237)
Except above mentioned correction, project participant's information is updated. Due to above correction, registered PDD (version 4.1 date of 14/10/2013) is revised as version 4.2 date of 18/12/2017.				
Conclusion	<p>The validation team confirms the PP has corrected the information on measurement method of moisture content of the gaseous stream at normal condition ($C_{H_2O,t,db,n}$) of Hu-Chems II, III and IV and tag number of temperature transmitter for measuring nitric acid production of Hu-Chems IV according to the actual installation in the revised PDD (v.4.2), and the changes do not affect the design of the project activity.</p> <p>The validation team confirms that the corrected information reflects actual project information in line with para. 288 of VVS (ver. 01.0).</p>			

D.4. Changes to the start date of the crediting period

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.5. Inclusion of a monitoring plan

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.7. Changes to the project design

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.8. Changes specific to afforestation and reforestation project activities

Means of validation	N/A
Findings	N/A
Conclusion	N/A

SECTION E. Internal quality control

According to KFQ's Procedure for deciding whether to proceed request for post registration changes, the final validation report and validation findings underwent a technical review before being submitted to the PP for requesting an approval of post registration changes. The technical review was performed by technical review team composed of a person for the project activity qualified in accordance with KFQ's qualification scheme for CDM project validation and verification.

SECTION F. Validation opinion

Korean Foundation for Quality (KFQ) has performed a validation for post registration changes of 'Catalytic N₂O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.' (UNFCCC Registration Ref. No. 0765). During the validation, corrections to project information from the registered PDD have been identified. The post registration changes have been validated in line with all relevant UNFCCC requirements for the CDM.

The validation is based on the registered PDD (ver. 4.1), applied methodology (ACM0019, Version 02.0) and the information made available to us. The review of the registered PDD (ver.4.1), revised PDD (ver. 4.2), relevant supporting documents, and the subsequent follow-up interviews have been conducted to determine the post-registration changes of the project activity meet all relevant UNFCCC requirements for the CDM.

The validation team confirms the PP has corrected the information of the project according to the actual installation in the revised PDD (ver.4.2). The correction to the project information do not affect the design of the project activity which is in line with Appendix of CDM Project Standard (ver.01), hence, an approval of the corrections is submitted under this issuance track.

As a result of our assessment, KFQ confirms the corrected information in the revised PDD (ver.4.2) reflects actual project information.

Therefore, KFQ recommends for approval of the post registration changes as justified above.

Signed on behalf of the Korean Foundation for Quality

Signature: 

Name : Soon Hong YEOM, Managing Director

Date : 20/12/2017

Appendix 1. Abbreviations

Abbreviations	Full texts
AOR	Ammonia oxidation reactor
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification Request
CMP	COP/MOP Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DCS	Distributed Control System
DOE	Designated Operational Entity
FAR	Forward Action Request
GC	Gas chromatography
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KFQ	Korean Foundation for Quality
KTL	Korean Testing Laboratory
LPG	Liquefied Petroleum Gas
MoC	Modalities of Communication
MP	Monitoring Plan
MR	Monitoring Report
NA	Nitric Acid
N ₂ O	Nitrous oxide
PDD	Project Design Document
PP	Project participant
PS	Clean Development Mechanism Project Standard
QMS	Quality Management System
SCR	Selective catalytic reduction
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



CERTIFICATE OF COMPETENCE

Name: Mi Jung LEE

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal energy generation
- 1.2 Renewables
- 3.1 Energy demand
- 5.2 Carprolactam, nitric and adipic acid
- 11.1 Emission of Fluorinated gases
- 11.2 Refrigerant gas production
- 13.1 Solid waste and wastewater
- 13.2 Manure

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 14 September 2017.

Sustainability Management Institute
Yu Shim JEONG



CERTIFICATE OF COMPETENCE

Name: Yu Shim JEONG

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.2 Renewables
- 5.1 Chemical Industry
- 5.2 Caprolactam, nitric acid, adipic acid
- 11.1 Emission of Fluorinated gases
- 11.2 Refrigerant gas production

She is approved as the qualification above according to the KFQ’s procedure of Qualifying and Maintaining of Auditor on 16 May 2016.

Sustainability Management Institute
Sang Yeon PARK

A handwritten signature in black ink, appearing to be 'S. Y. Park' with a stylized flourish at the end.



CERTIFICATE OF COMPETENCE

Name: Jin Seok CHO

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal energy generation
- 1.2 Renewables
- 13.1 Solid waste and wastewater
- 13.2 Manure

He is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 31 March 2016

Sustainability Management Institute
Sang Yeon PARK



CERTIFICATE OF COMPETENCE

Name: Sang Yeon PARK

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.2 Renewables
- 3.1 Energy demand
- 5.2 Caprolactam, nitric and adipic acid
- 13.1 Solid waste and wastewater

She is approved as the qualification above according to the KFQ’s procedure of Qualifying and Maintaining of Auditor on 31 March 2016

Sustainability Management Institute
Yu Shim JEONG

A handwritten signature in black ink, appearing to be 'Yu Shim JEONG'.

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Project participants	Monitoring report: Version 1.0: HUC-0765_MP#35_MR_v1 Version 1.1: HUC-0765_MP#35_MR_v1.1	From 10/11/2017 From 18/12/2017	Project participants
2	Project participants	CDM Project MS Excel Spreadsheet : Version 1.0: <ul style="list-style-type: none"> • HUC-0765_II_MP35_UNFCCC_CONFIDENTIAL • HUC-0765_III_MP35_UNFCCC_CONFIDENTIAL • HUC-0765_IV_MP35_UNFCCC_CONFIDENTIAL • HUC-0765_OVERALL_MP35_UNFCCC_CONFIDENTIAL Version 1.1: <ul style="list-style-type: none"> • HUC-0765_II_MP35_UNFCCC_CONFIDENTIAL • HUC-0765_III_MP35_UNFCCC_CONFIDENTIAL • HUC-0765_IV_MP35_UNFCCC_CONFIDENTIAL • HUC-0765_OVERALL_MP35_UNFCCC_CONFIDENTIAL 	All from 10/11/2017 All from 18/12/2017	Project participants
3	Project participants	CDM Project Design Document (Version 4.1) for the “Catalytic N2O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.” (Renewal of the crediting period) Version 4.2 date of 18/12/2017 as revised version from the registered PDD due to corrections	14/10/2013 Published under: https://cdm.unfccc.int/Projects/DB/TUEV-SUED1163081212.47/view 18/12/2017	Others
4	TUV NORD	Validation Report for the “Catalytic N2O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.” project. Report No. 800420315-13/095 (Renewal of the crediting period)	07/11/2013 Published under: https://cdm.unfccc.int/Projects/DB/TUEV-SUED1163081212.47/view	Others
5	KFQ	Verification/Certification Report for the “Catalytic N2O destruction project in the tail gas of three Nitric Acid Plants at Hu-Chems Fine Chemical Corp.” for the monitoring period from 16/04/2017 to 06/08/2017 (Version 01)	14/09/2017 Published under: https://cdm.unfccc.int/Projects/DB/TUEV-SUED1163081212.47/CP/FAZXN6VQ7XXO5PF73E0MV6184C5JF7/iProcess/KFQ1502676227.38/view	Others
6	TMS (Tele Measuring System) connected to environmental authority	Shutdown notification for nitric acid plant Hu-Chems II	From December 2012	Project participants
7	Hu-Chems & UHDE GmbH	Nitric acid plant Hu-Chems IV operation manual (Capacity) Nitric acid plant Hu-Chems III operation manual (Capacity) Udhe designed capacity Hu-Chems II, III	From 21/03/2014 From September 2016 From 20/07/2006	Project participants
8	Project participants	Equipment list and specifications for all monitoring equipment and analysers: <ul style="list-style-type: none"> • Plant Hu-Chems II • Plant Hu-Chems III • Plant Hu-Chems IV 	All from 06/11/2017	Project participants

9	Emerson Process Management	Instruction Manual – NGA 2000 for MLT Analyser (8 th Edition)	From August 2004	Project participants
10	UHDE GmbH TUEV Nord	Performance Guarantee Test Run (PGTR) protocols <ul style="list-style-type: none"> Plant Hu-Chems II Plant Hu-Chems III Plant Hu-Chems IV TUEV Nord PGTR Certificates <ul style="list-style-type: none"> Plant Hu-Chems II Plant Hu-Chems III Plant Hu-Chems IV 	From 02/04/2007 From 04/04/2007 From 16/01/2007 From 09/04/2007 From 09/04/2007 From 20/01/2007	Project participants
11	EPMK & Hu-Chems	Service Support Agreements: Delta-V system for EnviNOx® Hu-Chems as well as for Analyser systems for EnviNOx Hu-Chems between Hu-Chems Fine Chemical Corp. and Emerson Process Management Korea Ltd.	From 02/04/2013	Project participants
12	AIRTEC AIRTEC AIRTEC AIRTEC AIRTEC	Hu-Chems Plant II <ul style="list-style-type: none"> QAL 2 Test Certification Report (performed on 27/09/2017~29/09/2017), including moisture content measurement records & reports Hu-Chems Plant III <ul style="list-style-type: none"> QAL 2 Test Certification Report (performed on 06/09/2016~08/09/2016), including moisture content measurement records & reports Hu-Chems Plant IV <ul style="list-style-type: none"> AST Report (performed on 31/08/2017 to 01/09/2017), including moisture content measurement records & report Hu-Chems Plant IV <ul style="list-style-type: none"> QAL 2 Test Certification Report (performed on 28/08/2017~30/08/2017), including moisture content measurement records & reports AST Report (performed on 08/09/2016 to 09/09/2016), including moisture content measurement records & report 	From 10/11/2017 From 05/10/2016 From 21/11/2017 From 18/11/2017 From 10/10/2016	Project participants
13	European Committee for Standardization (CEN)	EN 14181:2014 – Stationary source emissions – Quality assurance of automated measuring systems	From November 2014	Others
14	Hu-Chems	Quality Management System (QMS) Documents <ul style="list-style-type: none"> CDM Operation Management Procedure (HFC-I-EP0448, Rev. 5) CDM Procedures for environment operation management (HFC-I-EP0446, Rev. 4) CDM Social Fund Commitment (HCSI-448, Rev. 2) 	From 12/06/2014 From 12/06/2014 From 12/03/2012	Project participants
15	Hu-Chems	Reactivation plan of Plant #2	From 20/09/2017	Project participants
16	CDM Executive Board	Methodology and Tools <ul style="list-style-type: none"> Methodology ACM0019 “N2O abatement from nitric acid production” (Version 02) Tool to determine the mass flow of a greenhouse gas in a gaseous steam (version 3.0) Tool to calculate project or leakage CO2 emission from fossil fuel combustion (version 03.0) 	From 31/05/2013 From 27/11/2015 From 22/09/2017 Published under: http://cdm.unfccc.int/methodologies/DB/MNMFNF10VUEOJACEIRX3EHYC9QXGDC	Others
		Standards, Procedures & Checklists <ul style="list-style-type: none"> Standard – CDM validation and verification standard for project activities (Version 01.0) Standard – CDM project standard for project activities 	From 03/03/2017 From 03/03/2017	

		(Version 01.0) <ul style="list-style-type: none"> • Standard – Sampling and surveys for CDM project activities and programme of activities (Version 07) • Procedure – CDM project cycle procedure for project activities (Version 01.0) • Guideline – Application of materiality in verifications (Version 02.0) • Checklist – Checklist for requests for issuance for project activities (Version 01.0) • Form – Project design document form (Version 10.1) • Form - Verification report form for post registration changes for CDM project activities (Version 02.0) 	From 04/05/2017 From 03/03/2017 From 20/02/2015 From 30/08/2017 From 28/06/2017 From 31/10/2017 All published under: http://cdm.unfccc.int/Reference/index.html	
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Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CLs from this validation

CL ID	-	Section no.	-	Date: -
Description of CL				
Project participant response				Date: -
Documentation provided by project participant				
DOE assessment				Date: -

Table 2. CARs from this validation

CAR ID	-	Section no.	-	Date: -
Description of CAR				
Project participant response				Date: 27/11/2017
Documentation provided by project participant				
DOE assessment				Date: 01/12/2017

Table 3. FARs from this validation

FAR ID	-	Section no.	-	Date: -
Description of FAR				
Project participant response				Date: -
Documentation provided by project participant				
DOE assessment				Date: -