



Validation report form for post-registration changes for CDM project activities
(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for post-registration changes for CDM project activities" at the end of this form.

VALIDATION REPORT ON POST-REGISTRATION CHANGES (PRCs)

Title and reference number of the project activity	K-water hydropower VI
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	Version 02.0
Completion date of the validation report on PRCs	26/05/2017
Type(s) of PRCs	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline <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 to a registered project activity <input checked="" type="checkbox"/> Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline <input type="checkbox"/> Changes to the project design of a registered project activity <input type="checkbox"/> Types of changes specific to afforestation and reforestation project activities
Version number of PDD to which this report applies	Version 05.0
Project participant(s)	Korea Water Resources Corporation (K-water)
Host Party	Republic of Korea
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral scope : 1 - Energy industries (renewable / non-renewable sources)
Name of DOE	Korea Testing & Research Institute(KTR)
Name, position and signature of the approver of the validation report on PRCs	Seonghun Cho, Director 

SECTION A. Executive summary

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Korea Water Resources Corporation (hereafter called “K-water”) has commissioned Korea Testing & Research Institute (hereafter called “KTR”) to validate the post-registration change of CDM project (title of the project activity: K-water hydropower VI).

“K-water hydropower VI” is a bundled renewable energy power generation project installing and operating a new run-of-river hydropower plant at three sites (Ipo, Yeosu, Gangcheon) where a weir is located.

The electricity generated from the hydropower plants is transmitted to the grid of Korea Electric Power Corporation (hereafter called “KEPCO”) which exclusively manages the national grid in Republic of Korea.

These three plants are located in Yeosu-Gun, Gyeonggi-do and have an installed capacity of 3,000 KW (Ipo), 4,950 KW (Yeosu), and 4,995 KW (Gangcheon) respectively.

As the total capacity of hydropower plants in the bundled CDM project activity is 12,945 KW, the project activity is fall into type I (renewable energy project) and small scale project for which installed capacity is less than 15MW.

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

The objective of a validation is to provide a thorough and independent third party assessment of the post-registration changes. In particular, the changes are validated in order to determine whether the project activity meets all applicable CDM requirements, relevant methodologies, tools and guidelines.

The validation consists of the following three phases:

- i) Objective review of the revised PDD(ver.05.0)^{/02/} and other relevant documents,
- ii) Following up interviews with PP,
- iii) Resolution of outstanding issues and issuance of the final post-registration changes validation report and opinion.

In summary, it is KTR’s opinion that the project correctly applies the baseline and monitoring methodology AMS-I.D(ver.17)^{/04/} and meets all relevant UNFCCC requirements for the CDM. The KTR thus requests approval of post-registration changes addressed for the project activity.

SECTION B. Validation team, technical reviewer and approver

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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 review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	LEE	Bongjae	KTR	X	X	X	X
2.	Validator	IR	CHOI	Jiseon	KTR	X	X	X	X
3	Validator	ER	SHIN	Woochul	KTR	X	X	X	X
4	Validator (Under Observation)	IR	KIM	Jonghoon	KTR	X	X	X	X

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	Kim	Kihong	KTR
2	Approver	IR	CHO	Seonghun	KTR

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

>> The revised PDD(ver.05.0)^{02/} submitted by K-water and additional background documents related to the project design and monitoring plan were reviewed by using KTR internal Quality procedures.

Furthermore, the validation team used additional documentation from third parties such as host party legislation, technical reports referring to the basic condition, and technical data. The list of documents reviewed during the validation process is provided in Appendix 3 of this report.

C.2. On-site inspection

Duration of on-site inspection: 20/02/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and Operation of the CDM project activity based on registered Monitoring Plan and physical features of the project activity as per registered PDD	Ipo, Yeosu, Gangcheon	20/02/2017	Bongjae LEE Jiseon CHOI Woochul SHIN Jonghoon KIM
2.	Information flows for generating, aggregating and reporting the monitoring parameters			
3.	Competency of operational personnel, monitoring personnel and calibrating agencies			
4.	Data collection procedures			
5.	Calibration performance and monitoring practices followed for monitoring equipment's used in the project activity			
6.	Quality Control and Quality Assurance procedures against the approved monitoring plan			
7.	Calibration and assumptions made in determining the GHG data and emission reduction			
8.	Compliance with CDM criterion and relevant guidance with respect to MP			
9.	Level of accuracy (Materiality) of the monitoring activity			

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Kim	Yongpil	Ipo Part of O&M of K-water	20/02/2017	- General aspects of the project - Changes made since the previous validation - Quality management system - Involved personnel and responsibilities - Technical equipment and their operation - Monitoring and measuring instruments - Calibration procedures - Records of metering equipment - Maintenance of Facility - Training and practice of the operational personnel - Implementation of the MP - Monitoring data management - GHG calculation - Data collection procedures	Bongjae LEE Jiseon CHOI Woochul SHIN Jonghoon KIM
2	Han	Cheolhee	Gangcheon Part of O&M of K-water			
3	Jeon	Seungin	Yeoju Part of O&M of K-water			
4	Kim	Deogje	K-water (Headquarter)			
5	Jo	Jeong hong	K-water (Headquarter)			

C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	-	-
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Corrections	-	-	-
Changes to the start date of the crediting period	-	-	-
Inclusion of a monitoring plan to a registered project activity	-	-	-
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Changes to the project design of a registered project activity	-	-	-
Types of changes specific to afforestation and reforestation project activities	-	-	-
Others (please specify)	-	-	-
Total	0	0	0

SECTION D. Validation findings**D.1. Compliance with PDD form**

Means of validation	The validation team has determined whether the PDD has been completed using the valid version of the applicable PDD form. The validation team has checked whether all the sections of the PDD follow the guidelines provided in the template itself.
Findings	There is no CAR/CL raised in this section.
Conclusion	<p>The validation team conducted the document review on the following document to validate whether the revised PDD(ver.05.0)^{/02/} is compliance with the PDD form(ver.08.0)^{/05/}.</p> <ol style="list-style-type: none"> UNFCCC website for the latest form for the revised PDD^{/02/} CDM-SSC-PDD-FORM(ver.08.0)^{/05/} and Attachment: Instructions for filling out the PDD form^{/05/} for small-scale CDM project activity. <p>The following is confirmed:</p> <ol style="list-style-type: none"> The PDD is completed using the valid version of PDD at the time of submission and the PP used the appropriate template (i.e. small scale) All the information has been correctly transferred from the registered PDD (ver.04.0)^{/01/}. The PDD is in compliance with the instruction provided in the template. As per the requirement of the PRC, both clean^{/02/} and track change versions^{/02/} of the PDD are submitted for validation. <p>The validation team has concluded that the PDD has been completed using the valid version of the applicable PDD form^{/05/} and that the guidelines^{/08/} given in the template itself have been properly followed.</p>

D.2. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

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

D.3. Corrections

Means of validation	The validation team conducted the document review on revised PDD(ver.05.0) ^{/02/} applied with on-site inspections to validate the compliance with PS(ver.09.0) ^{/03/} .		
Findings	There is no CAR/CL raised in this section.		
Conclusion	1. Monitoring Organization (Clause B.7.3)		
	Clause of PDD(ver.05.0)	Registered monitoring plan	Permanent changed from registered monitoring plan
	B.7.3 (1) Monitoring Organization	As shown in the figure, each Operation & Maintenance Team of the plant will observe monitoring system's operation and transmission of overall data to the Integrated Operations Center of the project. Integrated Operations Center of the project will take the responsibility for electrical engineering work and safety management including repair and calibration of the watt-hour meter. And the Green	As shown in the figure, each Part of Operation & Management will observe monitoring system's operation and transmission of overall data to the Hangang Weir Office. And Hangang Weir Office will take the responsibility for electrical engineering work and safety management including repair and calibration of the watt-hour meter. And the New & Renewable Energy Department of Head office will monitor data of electricity supplied to KEPCO grid from

	Energy Dept of Head office will monitor data of electricity supplied to KEPCO grid from the power house on site and 'Power Generation Total Information System' which is the database systems owned by K-water.	the power house on site and 'Power Generation Total Information System' which is the database systems owned by K-water.
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Validation opinion:

With reference to the re-organization of K-water, effective as of 22/11/2016, The title of Department and center has been changed as follows:

Section	Title Before re-organization	Title After re-organization
Head Office	Green Energy Dept	New & Renewable Energy Department
Hangang Office	Integrated Operations Center	Hangang Weir Office

These changes in titles of monitoring organization have been reflected in the revised PDD accordingly.

However, the structure of the monitoring organization and responsibility related to the CDM project activity remains unchanged.

The validation team checked the re-organization rules^(09/) of K-water and its Internal official letter^(10/) dated 22/11/2016 and found it to be properly reflected in the revised PDD(ver.05.0)^(02/).

Hence, the validation team concluded that this is acceptable.

With reference to the finding above, this correction falls under appendix 1 of PS ver.9.0, which do not require prior approval by the EB.

2. Installation of Meters

Clause of PDD(ver.05.0)	Registered monitoring plan	Permanent changed from registered monitoring plan
B.7.3 (3) Installation of Meters	In the case of Ipo, Gangcheon hydropower plants, the watt-hour meters for measuring the amount of electricity both exported to the grid and imported from the grid are installed in two lines separately, respectively. The auxiliary power consumed for the power house is supplied from KEPCO grid all the time regardless of the generator's operation.	In the case of Ipo, Gangcheon hydropower plants, the watt-hour meters for measuring the both amount of electricity exported to the grid and imported from the grid are installed in two lines separately, respectively as shown in Figure B.6. There is KEPCO's watt-hour meter in the administration building and K-water's meter is separately installed and used to measure internal consumption of power house. And the auxiliary power consumed for the power house is supplied from KEPCO grid through the administration building all the time regardless of the generator's operation until 01/12/2016. However, from 02/12/2016, the watt-hour meters for measuring the both amount of electricity exported to the grid

and imported from the grid are installed in a single line as shown in Figure B.7. So the electricity consumed for internal consumption is directly provided to the power house from KEPCO grid and the electricity is measured by the KEPCO's meter. And the auxiliary power consumed for the power house is internally supplied from the electricity generated during the generator's operation and supplied from KEPCO grid when the generator is stopped.

Validation opinion:

In the case of Ipo and Gangchen hydropower plants, the watt-hour meters for measuring the both amount of electricity exported to the grid and imported from the grid are installed in two lines separately, respectively until 01/12/2016. The main meter for electricity imported from KEPCO grid is installed in the administration building and K-water's meter for power house is located though the administration building as shown below.

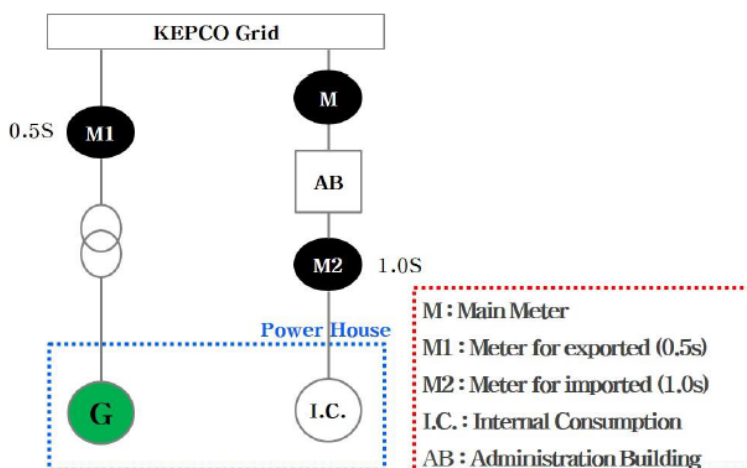


Figure. A previous single-line diagram for Ipo, Gangcheon power plant

The verification team checked the previous single line diagrams^{/12/} showing the location of KEPCO's meter for electricity consumption and internal K-water's meter for imported electricity of power house during the on-site visits.

And it was found that the previous line diagrams^{/12/} described in the registered PDD(ver.04.0) could not represent the actual project activity.

The correction of the single line diagram^{/12/}, related to both Ipo and Gangcheon sites, described in the revised PDD(ver.05.0)^{/02/} is to add the symbols of meter imported from grid and Administration building.

It was confirmed that the correction of this diagram is to represent the actual project design, not to change of the project design.

Therefore, this correction is acceptable.

These changes to project information of the revised PDD(ver.05.0)^{/02/} fall under section 1 of appendix 1 of PS(ver.9.0)^{/03/} which do not affect the design of the project activity and which do not require prior approval by the EB.

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 to a registered project activity

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

D.6. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	The validation team conducted the document review on the following documents and on-site inspections to validate compliance with the revised PDD(ver.05.0) ⁰² in accordance with followings: <ul style="list-style-type: none">● Registered PDD(ver.04.0)^{01/}● Appendix 1 of PS(ver.09.0)^{03/}● VVS(ver.09.0)^{14/}● AMS-I.D(ver.17.0)^{04/}		
Findings	There is no CAR/CL raised in this section.		
Conclusion	1. EG _{export,y} (Clause B.7.1.)		
	Data/Parameter	Registered monitoring plan	Permanent changed from registered monitoring plan
	Measurement methods and procedures	Continuously measured and hourly recorded by the watt-hour meter.	Continuously measured by the watt-hour meter and monthly recorded by the person in charge of CDM in New & Renewable Energy Department.
	QA/QC procedures	The amount of electricity supplied to the grid will be double checked by receipt of electricity sales.	The amount of electricity transmitted to the grid will be electronically measured and transferred to KPX and K-water, so it will be double checked by both entities.
Validation opinion: <i>- Measurement methods and procedures:</i> With reference to recording frequency, by reviewing the desk review and interviewing the staff from the New & Renewable Energy Dept., the validation team confirmed the actual data management has been processed as follows: First, the watt-hour meters installed at sites has been measured continuously. Second, the measured data has been transferred to KPX hourly and 'Power Generation Total Information System' of K-water daily. Third, the measured data of the 'Power Generation Total Information System' of K-water is recorded in the K-water's spreadsheets ^{15/} by the staff in charge of CDM in the New & Renewable energy department. Even though recording frequency from hourly to monthly has been changed, the validation team found that this is still within the applied methodology AMS-I.D (ver.17.0), which required recording on a monthly basis. Hence, this change falls under section 5(g) of the appendix of PS (ver.9.0), which does not require prior approval by the EB. <i>- QA/QC procedures:</i> The means to double-check the recorded data has been changed from receipt of electricity sales to the data of KPX. This change is necessary because the KPX receipt of electricity sales provides the information on the amount of electricity for the whole K-water plants and does not provide the information on the amount of electricity for each plant.			

The data on electricity generation has been wirelessly transmitted to the KPX system hourly and K-water system daily respectively.
In accordance with the 'Rules on the operation of electric utility market'^{107/}, these are cross checked by two entities to confirm the amount of electricity generated. Therefore, the measured data on the amount of the electricity is double checked against the data electronically transferred to KPX and K-water.
The validation team confirmed that the change in cross-checking method does not deteriorate the quality of data and complied with the approved methodology. Thus, it is acceptable.

2. $EG_{import,y}$ (Clause B.7.1.)

Data/Parameter	Registered monitoring plan	Permanent changed from registered monitoring plan
Measurement methods and procedures	Continuously measured and monthly recorded by the watt-hour meter of KEPCO in the case of Yeosu. Continuously measured and monthly recorded by the watt-hour meter of Kwater in the case of Ipo and Gangcheon.	Continuously measured by the watt-hour meter of KEPCO and monthly recorded by the person in charge of CDM in New & Renewable Energy Department in the case of Yeosu. Continuously measured by the watt-hour meter of K-water and monthly recorded by the person in charge of CDM in New & Renewable Energy Department until 01/12/2016 in the case of Ipo and Gangcheon. From 02/12/2016, the same as the case of Yeosu.
QA/QC procedures	The amount of electricity imported from the grid will be checked by jobsheet of K-water in the case of Ipo and Gangcheon.	The amount of electricity imported from the grid will be checked by jobsheet of K-water in the case of Ipo and Gangcheon until 01/12/2016. From 02/12/2016, as using the watt-hour meter of KEPCO, the amount of electricity imported from the grid will be checked by receipt of KEPCO in the case of Ipo and Gangcheon.

Validation opinion:

- Measurement methods and procedures:

During the on-site visits to Ipo and Gangcheon sites, the validation team found that installation scheme for the watt-meters for electricity consumption have been changed; the meters previously installed on a separate line have been moved to the single line where the watt-hour meters for electricity generation are installed. This relocation of watt-meters for electricity consumption has been completed on 02/12/2016.

The PP has provided the evidence confirming that the change of monitoring equipment was done according to the Power Purchase Agreement (PPA)^{11/} with KEPCO.

The validation team confirmed that this change was made for the efficient management of electricity usage by KEPCO. The team has also checked the revised line diagrams^{12/} showing the change at Ipo site and Gangcheon site and confirmed that the watt-hour meters have been moved from the separate line to the single line where the watt-hour meters for electricity generation are installed.

When the meters for electricity consumption had been relocated, the previous meters of K-water had been changed to the new introduced meters owned by KEPCO.

The team found that the accuracy class of the watt-meters was 0.5 S which is within the allowable error ($\pm 1.0\%$) of watt-meter indicated in registered PDD^{/01/} and stipulated in the 'Measures act'^{/06/} at class 1.0S in the case of Ipo and Gangcheon.

Accuracies of these meters were validated by reviewing the specification^{/13/} of watt-hour meters (Ipo site, Gangcheon site) and through physical on-site visits. These changes has been valid from 02/12/2016 at both Ipo and Gangcheon sites. The Yeosu site still remains unchanged.

Hence, these changes fall under section 5 (b) and (c) of appendix 1 of PS(ver.09.0)^{/03/} which do not require prior approval by the EB.

- QA/QC procedures:

Due to the changes in watt-hour meters for electricity consumption effective from 02/12/2016 at Ipo and Gangcheon sites, applicable QA/QC procedures^{/16/} shall be revised accordingly. Since the relocated watt-hour meters are under control of KEPCO, unlike the previous meters managed by K-water, the receipt of electricity consumption usage from KEPCO will be issued monthly. Thus, the amount of electricity consumption will be checked by receipt from KEPCO for both Ipo and Gangcheon sites.

This change of data collection method will not deteriorate the data quality. In conclusion, this changes fall under section 5 (b) and (c) of appendix 1 of PS(ver.9.0)^{/03/}, which do not require prior approval by the EB.

3. Installation of meters (Clause B.7.3(3))

Data/Parameter	Registered monitoring plan	Permanent changed from registered monitoring plan
B.7.3 (3) Installation of meters	In the case of Ipo, Gangcheon hydropower plants, the watt-hour meters for measuring the amount of electricity both exported to the grid and imported from the grid are installed in two lines separately, respectively. The auxiliary power consumed for the power house is supplied from KEPCO grid all the time regardless of the generator's operation.	In the case of Ipo, Gangcheon hydropower plants, the watt-hour meters for measuring the both amount of electricity exported to the grid and imported from the grid are installed in two lines separately, respectively as shown in Figure B.6. There is KEPCO's watt-hour meter in the administration building and K-water's meter is separately installed and used to measure internal consumption of power house. And the auxiliary power consumed for the power house is supplied from KEPCO grid through the administration building all the time regardless of the generator's operation until 01/12/2016. However, from 02/12/2016, the watt-hour meters for measuring the both amount of electricity exported to the grid and imported from the grid are installed in a single line as shown in Figure B.7. So the electricity consumed for internal consumption is directly provided to the power

		house from KEPCO grid and the electricity is measured by the KEPCO's meter. And the auxiliary power consumed for the power house is internally supplied from the electricity generated during the generator's operation and supplied from KEPCO grid when the generator is stopped.
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Validation opinion:

As discussed in 2. EG_{import,y}, in both Ipo and Gangcheon sites, the location of watt-meter for electricity consumption has been changed from the separated line of KEPCO to the single line, where the watt-hour meter of electricity generation has been installed.

This location change of watt-meter for electricity consumption has been completed on 02/12/2016.

The PP has provided the evidence to confirm that the change of monitoring equipment was done according to the Power Purchase Agreement (PPA)^{11/} with KEPCO.

Hence, this is acceptable.

4. Data recording (Clause B.7.3(4).)

Data/Parameter	Registered monitoring plan	Permanent changed from registered monitoring plan
B.7.3 (4) Data recording	<p><u>Electricity exported to the grid</u> The data will be continuously measured and hourly recorded by the watt-hour meter. And also, the data of electricity exported to KEPCO grid are hourly recorded on KPX and 'Power Generation Total Information System' of K-water.</p> <p><u>Electricity imported from the grid</u> The data will be continuously measured and monthly recorded by the watt-hour meter. And also, the data of electricity imported from KEPCO grid are monthly checked by receipt of KEPCO in the case of Yeosu. In the case of Ipo and Gangcheon, the data of electricity imported from KEPCO grid are monthly checked by each plant's jobsheet of K-water.</p>	<p><u>Electricity exported to the grid</u> The data will be continuously measured by the watt-hour meter and monthly recorded by the person in charge of CDM in New & Renewable Energy Department. And also, the data of electricity exported to KEPCO grid are hourly transferred to KPX and daily transferred to 'Power Generation Total Information System' of K-water from KPX.</p> <p><u>Electricity imported from the grid</u> The data will be continuously measured by the watt-hour meter and monthly recorded by the person in charge of CDM in New & Renewable Energy Department. And also, the data of electricity imported from KEPCO grid are monthly checked by receipt of KEPCO in the case of Yeosu. In the case of Ipo and Gangcheon, the data of electricity imported from KEPCO grid are monthly checked by each plant's jobsheet of K-water until 01/12/2016. From 02/12/2016 as using the watt-hour meter of KEPCO, the data of</p>

		electricity imported from the grid will be checked by receipt of KEPCO.
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Validation opinion :**(1) Monitoring frequency**

In regards to the electricity exported to the grid, as discussed in 1. $EG_{\text{export},y}$, the monitoring frequency has been changed from hourly to monthly.

The validation team found that this is still within the applied methodology AMS-I.D (ver.17.0)^{/04/} which required recording on a monthly basis. Hence, this change fell under section 5(g) of appendix of PS(ver.9.0)^{/03/}, which does not require prior approval by the EB.

In regards to the electricity imported to the grid, as discussed in 3. $EG_{\text{import},y}$, the location of the watt-meter for electricity consumption has been changed from the separated line of KEPCO to the single line, where the watt-hour meter of electricity generation has been installed in accordance with the PPA^{/11/} from KEPCO.

From 02/12/2016, the data recording has been changed from the job sheet to the receipt of KEPCO in the case of both Ipo, Gangcheon sites.

The person in charge of CDM in New & Renewable Energy Department will be recorded monthly by reviewing the receipt of KEPCO

The validation team confirmed that this change does not deteriorate the data quality.

Hence, this is acceptable.

During the on-site visits to Ipo and Gangcheon sites, the validation team found that installation scheme for the watt-meters for electricity consumption have been changed; the KEPCO meters previously installed on a separate line have been moved to the single line where the watt-hour meters for electricity generation are installed.

The validation team concluded that:

- The proposed permanent changes do not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan. The relocation of monitoring equipment (watt-hour meters) from the separated line of KEPCO to the single line where the watt-hour meters for electricity generation are installed does not deteriorate the monitoring quality and still within applied methodology AMS-I.D(ver.17)^{/04/}.
- The new introduced meter for electricity consumption has the same accuracy level with the one stipulated in the registered PDD(ver.04.0)^{/01/} and is still within the applied methodology AMS-I.D(ver.17)^{/04/}
- The title of CDM monitoring organization has been changed because of re-organization of K-water. However, the structure of monitoring organization responsible for the CDM project activity remained unchanged. These title changes are not likely to lead to a reduction in the accuracy of the calculation of emission reductions.

(2) Role and Responsibility

In line with the internal K-water QA/QC procedures^{/16/} and Clause B.7.3 (1. Monitoring Organization) of the revised PDD, amount of exported/imported electricity will be recorded by the person in the New & Renewable Energy Dept. This is a change in the monitoring plan to clarify the responsibility and the role for recording of the data^{/15/} on the amount of imported/exported electricity. As this change is to define the responsibility and the role more clearly, it is accepted.

The validation team concluded that:

- The title of CDM monitoring organization has been changed because of reorganization of K-water. However, the structure of monitoring organization responsible for the CDM project activity remained unchanged. These title changes are not likely to lead to a reduction in the accuracy of the calculation of emission reductions.

	<ul style="list-style-type: none"> - For the amount of electricity supplied to the grid, recording frequency from hourly to monthly has been changed, the validation team found that this is still within the applied methodology AMS-I.D (ver.17.0)^{04/}, which required recording on a monthly basis. Furthermore, the means to double-check the recorded data has been changed from receipt of electricity sales to the data of KPX. this change in cross-checking method does not deteriorate the quality of data and complied with the approved methodology. - Amount of exported/imported electricity will be recorded by the person in New& Renewable Energy Department. This is a change in the monitoring plan to define the responsibility and the role more clearly - The proposed changes do not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan and still within applied methodology AMS-I.D. (ver.17)^{04/}. <p>With reference to the findings above, these changes fall under appendix 1 of PS(ver.9.0)^{03/}, which do not require prior approval by the EB.</p>
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D.7. Changes to the project design of a registered project activity

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

D.8. Types of changes specific to afforestation and reforestation project activities

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

SECTION E. Internal quality control

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Internal quality control within the team is assured through a technical review process that takes place after the on-site assessment and after closure of findings. The internal quality control in the validation process affects the final decision.

When performing the technical review, the reviewer ensures that:

The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

The review encompasses all aspects related to the project, which includes project design, baseline, additionality, MPs and emission reduction calculations, internal quality assurance systems of the PP, as well as the project activity, closure of CARs and CLs during the validation exercise, review of sample document.

The finalized validation opinion will be accepted for further processing such as uploading via the UNFCCC interface.

SECTION F. Validation opinion

>> KTR has performed a validation of post-registration changes of K-water hydro power VI project, CDM Registration Reference Number 7140, which is located in Yeosu-gun, Gyeonggi-do, Republic of Korea. The validation was performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation consists of the following three phases: i) desk review of the project related document and additional background documents for the PRC; ii) following-up interviews with the PPs; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. KTR has performed The review of the revised PDD(ver.05.0)^{02/}, relevant additional information and the subsequent following-up interview with sufficient evidence to determine the fulfilment to stated criteria. In our opinion, the post-registration changes meet all relevant UNFCCC requirements for the CDM. KTR thus requests approval of post-registration changes addressed for the project activity.

Appendix 1. Abbreviations

Abbreviations	Full text
AMS	Approved small scale methodologies
CA	Corrective Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
CL	Clarification Request
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties
COP/MOP	The Conference of the Parties serving as the meeting of the Parties to the Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ER	External Resource
ER	Emission Reduction
FAR	Forward Action Request
IPCC	Intergovernmental Panel on Climate Change
IR	Internal Resource
KEPCO	Korea electric power corporation
KP	Kyoto Protocol
KPX	Korea power exchange
KTR	Korea Testing & Research Institute
K-Water	Korea Water Resources Corporation
MOC	Modalities of Communication
MP	Monitoring Plan
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
VVS	Clean Development Mechanism Validation And Verification Standard

Appendix 2. Competence of team members and technical reviewers

KTR

한국화학융합시험연구원

K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : LEE, Bongjae
 Date of Birth : August 6th, 1978
 Certificate Number : 2016CDM - 002

We, KTR, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.1	Thermal energy generation	Lead Validator/Verifier
1.2	Energy generation from renewable energy sources	Lead Validator/Verifier
3.1	Energy demand	Lead Validator/Verifier
4.1	Cement and lime production	Lead Validator/Verifier
13.1	Solid waste and waste water	Lead Validator/Verifier

Valid until : July 19th, 2019

July 19th, 2016



한국화학융합시험연구원장
 Korea Testing and Research Institute





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K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : CHOI, Jiseon
 Date of Birth : September 21th, 1984
 Certificate Number : 2016CDM - 003

We, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.1	Thermal energy generation	Full-time Validator/Verifier
1.2	Energy generation from renewable energy sources	Full-time Validator/Verifier
3.1	Energy demand	Full-time Validator/Verifier
13.1	Waste handling and disposal	Full-time Validator/Verifier

Valid until : July 19th, 2019

July 19th, 2016



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K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : SHIN, Woonchul
 Date of Birth : January 10th, 1957
 Certificate Number : 2014CDM - 014

We, KTR, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
10.1	Fugitive emissions from oil and gas	Part-time Validator/Verifier
11.1	Emissions of fluorinated gases	Part-time Validator/Verifier
11.2	Refrigerant gas production	Part-time Validator/Verifier

Valid until : December 27th, 2017

December 28th, 2014



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K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : KIM, Jonghoon

Date of Birth : June 11th, 1990

Certificate Number : 2017CDM - 002

We, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.2	Energy generation from renewable energy sources	Full-time Validator/Verifier

Valid until : January 31th, 2020February 1st, 2017

한국화학융합시험연구원장
Korea Testing and Research Institute





K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : KIM, Kihong
 Date of Birth : February 26th, 1979
 Certificate Number : 2014CDM - 006

We, KTR, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.2	Renewables	Lead Validator/Verifier
4.1	Cement and lime production	Lead Validator/Verifier
13.1	Solid waste and waste water	Lead Validator/Verifier

Valid until : December 27th, 2017

December 28th, 2014



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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	K-water	Registered PDD (ver.04.0)	N/A	PP
2	K-water	Revised PDD (ver.05.0) with clean version, Revised PDD (ver.05.0) with tracking version	N/A	PP
3	UNFCCC CDM	PS (ver.09.0)	N/A	Other
4	UNFCCC CDM	AMS-I.D (ver.17)	N/A	Other
5	UNFCCC CDM	CDM-SSC-PDD-FORM (ver.08.0)	N/A	Other
6	Korean Agency for Technology and Standards	Measures Act	N/A	Other
7	KPX	Rules on the operation of the electric utility market	N/A	Other
8	UNFCCC CDM	General guidelines to SSC CDM methodologies	N/A	Other
9	K-water	Re-organization rules of K-water on 22/11/2016	N/A	PP
10	K-water	Internal official letter dated on 22/11/2016	N/A	PP
11	KEPCO	Power Purchase Agreement (PPA)	N/A	PP
12	K-water	Single line diagrams (Ipo, Gangcheon)	N/A	PP
13	Manufacturer	specification of watt-hour meters (Ipo, Gangcheon)	N/A	Other
14	UNFCCC CDM	VVS(ver.09.0)	N/A	Other
15	K-water	Internal data sheet	N/A	PP
16	K-water	Internal CDM QA/QC procedures	N/A	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	xx	Section no.		Date: DD/MM/YYYY
Description of CL				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 2. CAR from this validation

CAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of CAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY