JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	Introduction of amorphous high efficiency transformers in power distribution systems in the southern part of Viet Nam
Reference number	VN004
Third-party entity (TPE)	Lloyd's Register Quality Assurance Limited (LRQA)
Project participant contracting the TPE	YUKO-KEISO Co., Ltd.
Date of completion of this report	22/03/2016

A.2 Conclusion of validation

Overall validation opinion	☒ Positive ☐ Negative

A.3. Overview of final validation conclusion

Only when all of the checkboxes are checked, overall validation opinion is positive.

Item	Validation requirements	No CAR or CL remaining
Project design document form	The TPE determines whether the PDD was completed using the latest version of the PDD forms appropriate to the type of project and drafted in line with the Guidelines for Developing the Joint Crediting Mechanism (JCM) Project Design Document, Monitoring Plan and Monitoring Report.	☒
Project description	The description of the proposed JCM project in the PDD is accurate, complete, and provides comprehension of the proposed JCM project.	☒
Application of approved JCM methodology (ies)	The project is eligible for applying applied methodology and that the applied version is valid at the time of submission of the proposed JCM project for validation.	☒
Emission sources and calculation of emission reductions	All relevant GHG emission sources covered in the methodology are addressed for the purpose of calculating project emissions and reference emissions for the proposed JCM project.	☒
	The values for project specific parameters to be fixed *ex ante* listed in the Monitoring Plan Sheet are appropriate, if applicable.	☒
Environmental impact assessment	The project participants conducted an environmental impact assessment, if required by the Socialist Republic of Viet Nam, in line with Vietnamese procedures.	☒

Item	Validation requirements	No CAR or CL remaining
Local stakeholder consultation	The project participants have completed a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed project.	☒
Monitoring	The description of the Monitoring Plan (Monitoring Plan Sheet and Monitoring Structure Sheet) is based on the approved methodology and/or Guidelines for Developing the Joint Crediting Mechanism (JCM) Project Design Document, Monitoring Plan, and Monitoring Report. The monitoring points for measurement are appropriate, as well as whether the types of equipment to be installed are appropriate if necessary.	☒
Public inputs	All inputs on the PDD of the proposed JCM project submitted in line with the Project Cycle Procedure are taken into due account by the project participants.	☒
Modalities of communications	The corporate identity of all project participants and a focal point, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories are included in the MoC.	☒
	The MoC has been correctly completed and duly authorized.	☒
Avoidance of double registration	The proposed JCM project is not registered under other international climate mitigation mechanisms.	☒
Start of operation	The start of the operating date of the proposed JCM project does not predate January 1, 2013.	☒

Authorised signatory:	Mr. ☒ Ms. ☐
Last name: Chiba	First name: Michiaki
Title: Climate Change Manager - Asia & Pacific	
Specimen signatu [redacted]	Date: 22/03/2016

B. Validation team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Michiaki Chiba	LRQA Ltd.	Team leader	☒	Technical competence authorised	☐
Mr. ☒ Ms. ☐	Stewart Niu	LRQA China	Team member	☒	N/A	☒
Mr. ☒ Ms. ☐	Nguyen Thang	External expert	Host country expert	☐	N/A	☒
Mr. ☒ Ms. ☐	Xianxin Yan	LRQA China	Internal reviewer	☒	N/A	☐

Please specify the following for each item.

* *Function: Indicate the role of the personnel in the validation activity such as team leader, team member, technical expert, or internal reviewer.*

* *Scheme competence: Check the boxes if the personnel have sufficient knowledge on the JCM.*

* *Technical competence: Indicate if the personnel have sufficient technical competence related to the project under validation.*

C. Means of validation, findings, and conclusion based on reporting requirements

C.1. Project design document form

<Means of validation>

The PDD was checked and confirmed as complete against JCM Guidelines for Developing PDD and MR No. JCM_VN_GL_PDD_MR_ver01.0. A valid form of the JCM PDD Form No. JCM_VN_F_PDD_ver01.0 is used for the PDD Version 1.0 dated 19/01/2016 (First Edition). It was re-checked for the revised PDD Version 2.0 dated 16/03/2016. The version is the final version on which the validation was completed.

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was identified to the requirement.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the PDD was completed using the valid form of the JCM PDD Form and in accordance with the JCM Guidelines for Developing PDD and MR.

C.2. Project description

<**Means of validation**>

The project is to reduce CO2 emissions by facilitating the utilisation of high efficient transformers in power distribution grid of Viet Nam. The project involves installation of high efficient amorphous transformers displacing conventional and more energy intensive transformers with silicon steel core.

The project transformers apply amorphous alloy core technology developed by Hitachi Metals Ltd., Japan and supplied by manufacturer Thibidi in Viet Nam. Amorphous transformer improves electrical characteristics and leads significant reduction of no load losses, i.e. stand-by electricity consumed regardless of the electricity load.

The project plans to install 1,618 amorphous transformers to the power distribution grid operated and maintained by EVN Southern Power Corporation (EVNSPC) in 18 Provinces and 1 province-level City in southern part of Viet Nam.

The project is participated by EVNSPC from the Socialist Republic of Viet Nam, and YUKO-KEISO Co., Ltd. from Japan (the PPs).

The start date of project operation is on 01/01/2016 and the expected operational lifetime of the project is for 18 years.

The project has been selected as one of the JCM model projects by the Ministry of the Environment, Japan (MOE) and receives financial support from the Government of Japan.

The validation team assessed the PDD and the supporting documents, conducted a physical site visit to validate the requirements concerning accuracy and completeness of the project description. Through the processes taken, 2 CLs were raised and subsequently closed as the resolution detailed below. The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

Grade / Ref: CL 1

Nature of the issue raised:

The PPs were requested to provide justification of the start date of the project operation with supporting evidence.

Nature of responses provided by the PPs:

The PPs clarified that the project transformers completed the installation by November 2015 and the start date was set on 01/01/2016 whereby the monitoring provisions became ready. The list of transformers indicating the installation dates and the operation certificates of the transformers were provided as the evidence.

Assessment of the responses:
The validation team confirmed the status of installation of the project transformer based on the list of equipment, the operation certificates and the physical on site survey. The start date was considered reasonable based on the implementation status as confirmed through the on site assessment and the interviews of the PPs. The CL was closed.

Grade / Ref: CL 2
Nature of the issue raised:
The PPs provided Statutory useful life for the calculation of depreciation and amortization for machinery and equipment issued by Japan's Ministry of Finance as the supporting document of the expected operational lifetime, but further justification is requested on how the regulation in Japan is applicable to the equipment manufactured and used in Vietnam.

Nature of responses provided by the PPs:
The PPs explained that the time of depreciation of transformers and electrical equipment determined based on the technical service life is 7-15 years according to the Ministry of Finance Circular No. 45/2013/TT-BTC Guiding Regulation on Management, use and depreciation of fixed assets dated 25/04/2013. Considering the actual service life of the type of equipment under a normal use of 20-25 years, the PPs selected the one specified in the regulation in Japan.

Assessment of the responses:
The validation team reviewed the regulatory documents in the host country and confirmed that the expected operational lifetime of project has been determined taking into consideration the regulations in Japan and the host country as well as the industrial practices and it is longer than crediting period included in the PDD. Therefore the CL was closed.

<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The validation team assessed the project description provided in the PDD with the supporting documents and conducted a physical site visit to validate the requirements on the accuracy and completeness. The CLs raised were successfully closed as the resolution above detailed. The validation team confirmed that the proposed JCM project in the revised PDD is described in accurate and complete manners that is understandable the nature of the proposed project activity.

C.3. Application of approved methodology(ies)

<**Means of validation**>

The project applied the approved methodology: JCM_VN_AM005_ver01.0 "Installation of energy efficient transformers in a power distribution grid". The methodology is approved by the JC on 03/09/2015 and valid as of the time of the validation.

The validation team assessed if the selected methodology is applicable to the proposed project. The project applicability was checked against each criterion in the approved methodology selected. The steps taken to validate each eligibility criterion and conclusions about its applicability to the proposed project are summarised as below.

Criterion 1: Single-phase and/or three-phase oil-immersed transformer with amorphous metal core is installed in the distribution grid.

Justification in the PDD: Distribution transformers installed by the project are either single-phase or three phase oil-immersed transformer with amorphous metal core.

Steps taken for assessment: The validation team assessed the project documentation, technical specification of the transformers, the test reports and conducted physical on site assessment.

Conclusion: The validation team confirmed that the project installs single-phase and three phase oil-immersed transformers with amorphous metal core in the distribution grid of EVN-SPC and the criterion is met by the project.

Criterion 2: Load losses of the project transformer determined in line with IEC 60076-1 or national/industrial standards complying with IEC 60076-1 is equal or smaller than the standard values or specification values of load loss, required by the power company of the grid where the project transformer is installed, corresponding to its capacity and number of phases.

Justification in the PDD: It has been confirmed that the load loss of the project transformers are smaller than the standard/specification values of load loss, required by the power company of the grid where the project transformer is installed, corresponding to its capacity and number of phases.

Load losses of the project transformer are determined in line with EVN SPC standard MBA-03_MBA 3P22/0,4kV(Code : EVN SPC-KTSX/QyĐ.114) and MBA-01_MBA 1P12,7/0,23kV(Code: EVN SPC-KTSX/QyĐ.114）

Steps taken for assessment: The validation team reviewed EVN-SPC standards MBA-01 and MBA-03, the tender specification, test reports, IEC60076-1 and TVCN6306-1.

Conclusion: The validation team confirmed that the load loss of the project

transformers is smaller than the values corresponding to the capacity and number of phases specified in the standard requirements of the power company taking into account the national and international standards, and the criterion is met by the project.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was raised to the requirements of this section.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed that the project applied the valid version of the approved methodology and the applicability was demonstrated to the eligibility criteria as appropriate.

C.4. Emission sources and calculation of emission reductions

<**Means of validation**>

The validation team assessed the documented evidence and by means of on site visit confirmed that all the relevant GHG emission sources covered in the applied methodology are addressed, and the steps taken and the equations applied to calculate project emissions and reference emissions for the proposed project comply with the requirements of the approved methodology.

The emission sources are no load losses of grid electricity by reference transformers and project transformers and CO2 is the GHG to be accounted.

The reference emissions are determined as a product of no load losses of the reference transformers determined on the capacity category and the energizing time, the blackout rate, and CO2 emission factor of the grid electricity.

The CO2 emission factor of the grid electricity is determined ex-ante and fixed for the project period based on the latest value published by the Ministry of Natural Resources and Environment of Vietnam (MONRE) at 0.5657 tCO2/MWh based on the data in year 2013.

The project emissions are calculated by no load losses of the project transformers determined on the capacity category, maximum allowable uncertainty for the no load losses of the project transformer, the energizing time, blackout rate, and the CO2 emission factor of the grid electricity.

The reference emissions are estimated ex-ante 1,005.1 tCO2 in a year.

The project emissions are estimated ex-ante 394.7 tCO2 in a year.

The total emission reductions are therefore estimated ex-ante 610 tCO2 in a year.

The details of the persons interviewed and the documents reviewed are shown in the

Section E of this report.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was raised to the requirement of the section.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed that:

- The methodology was applied correctly to calculate project emissions and reference emissions and no other significant emission source was identified that would be affected and reasonably attributed by implementation of the proposed project but not addressed by the applied methodology;
- The choice of whether an emission source or gas is to be included where the applied methodology allows was reasonably justified by the PPs;
- The Monitoring Plan Sheet (MPS) was not altered and the fields were filled in as required so that all estimates of the reference emissions could be replicated using the data and parameter values provided in the PDD;
- The values for the project specific parameters fixed ex ante listed in the MPS were appropriate with all the data sources and assumptions and the calculations were correct to the proposed JCM project;
- All assumptions and data used by the PPs were listed in the PDD, including their references and sources; and
- All values used in the PDD were considered reasonable in the context of the proposed JCM project.

C.5. Environmental impact assessment

<**Means of validation**>

The proposed project is to install energy efficient amorphous transformers in the power distribution systems of southern part of Viet Nam and the PDD stated that an environmental impact assessment is not required by laws of the host country. The project applies energy efficient amorphous transformers in place of silicon steel core transformers that does not result in a significant environmental impacts. The validation team assessed the applicable legal requirements in the host country using its local expertise.

The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was raised to the requirement of the section.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed by assessing the relevant documents and using the local expertise and confirmed that the project does not need an environmental impacts assessment to be conducted to meet the legal requirement of the host country and the PDD satisfies the requirements of the JCM.

C.6. Local stakeholder consultation

<**Means of validation**>

The PPs identified EVNSPC, the power distribution companies under EVNSPC who operate and maintain the power grid, and the related government bodies as the local stakeholders and collected comments on the proposed project through individual meetings and holding a stakeholder consultation meeting on 16/11/2015. The PPs also held meetings to collect comments from officials of MOF, MOIT and MONRE on 16&17/12/2015. The local stakeholders appreciate the project and provided positive comments. No negative issue was raised through the processes that require actions to be taken by the PPs.

The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was raised to the requirement of the section.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed that the PPs have invited comments to the proposed project from the relevant local stakeholders, the summary of the comments received is provided in the PDD in a complete manner and the PPs have taken due account of all the comments received from the local stakeholders as the processes described in the PDD.

C.7. Monitoring

<**Means of validation**>

The Monitoring Plan (MP) consisting of the MPS and Monitoring Structure Sheet (MSS) was based on the approved methodology. The monitoring parameter is energizing time of the project transformers.

Energizing time of the project transformers is monitored by counting of the number of

hours in the monitoring period less the outage hours. The outage hours such as power outage, repair/replacement and maintenance are monitored and recorded by the organization in charge of operation of the transformers.

The management structure has been designed and roles and responsibilities have been assigned to the JCM Project Manager, JCM Monitoring Manager and JCM Facilities Manager as specified in the MSS.
The validation team confirmed that the MP complied with the requirements in the approved methodology and that the PPs will be able to apply the MP following the monitoring arrangements described in it. The CARs and CLs were raised and resolved as below detailed. The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

Grade / Ref: CAR 2

Nature of the issue raised:

The Monitoring Plan Sheet was not completed with the estimated value of the parameters Hi,p, NLLRE,i,j,k, NLLPJ,i,j,k and UNCi. The PPs were requested to provide supporting evidence of each value applied.

Nature of responses provided by the PPs:

Estimated values of Hi,p, NLLRE,i,j,k, NLLPJ,i,j,k and UNCi. for each transformer were provided in the revised MPS with the supporting evidence.

Assessment of the responses:

The estimated value of the parameters Hi,p, NLLRE,i,j,k, NLLPJ,i,j,k and UNCi are to input on “MPS(input_separate)” sheet according to the form of the approved methodology.

The parameter Hi,p, is indicated as 8,760 hours/p for all the transformers. According to the justification of Measurement methods and procedures of the MPS (input sheet), the monitoring period is set to start after completion of installation of all the project transformers. The date of completion for installation of the project transformers can be confirmed by the operation certificates. The real installation day in the list of transformer is based on the installation and start of energizing/operation confirmed on the implementation completion report.

The values for the parameter NLLRE,i,j,k, is set in accordance with the standard no load loss required by EVNSPC as per the standards MBA-01 and MBA-03.

The values for the parameter NLLPJ,i,j,k is indicated not as confirmed in the manufacturer's performance test report measured at the time of pre-delivery test, but using the standard no load loss for amorphous metal core transformers as provided in the Additional information for the proposed methodology "Installation of energy efficient transformers in a power distribution grid". According to the PPs, the values of no load loss of the project transformers are defined in the tender specification of the EVNSPC and the test certificates of the individual transformers confirmed that the measured value of no load loss is less than the value required in the tender specification of the EVNSPC. The PPs applied the standard values in the ERs calculation instead of the measured values of the individual transformers but it is conservative for the ERs calculation.

The value of the parameter UNCi is 0.15 for all the transformers. The test reports for the manufacturer's performance test at the time of pre-delivery inspection do not indicate the values obtained by the performance test of the individual transformers but confirm the conformity with the requirements of TCVN6306 / IEC60076 wherein the maximum tolerance of losses is indicated as +15%.

The validation team reviewed the revised MPS and the supporing evidence and confirmed that the relevant values are provided for the parameters in the revised MPS to which the PPs provided justification respectively. The value applied for calculation of emission reductions is not The CAR was closed.

Grade / Ref: CAR 3
Nature of the issue raised:
The measurement methods and procedures did not include QA/QC procedures applied.

Nature of responses provided by the PPs:
QA/QC procedures have been included in the measurement methods and procedures for energizing time of the project transformers. The counting of the number of hours in the monitoring period will be done by designating the starting date of the monitoring period. As a QA/QC procedure, the PPs will ensure that the counting of the hours does not start before implementation and starting of operation of all transformers under the project are completed. The date of completion of transformer implementation and the

start of the operation will be confirmed by reviewing the implementation completion report for each transformer. The "real installation day" in the list of the project transformers is the date of implementation completion and the start date of the operation.

Assessment of the responses:
The PPs revised the description of the measurement methods and procedures in the MPS. The start and end days during the monitoring period will be cross checked by the PPs with the implementation completion report of each transformer and records of repair and replacement so that the counting of the energizing time can be assured not to start before actual operation and to be adjusted with outage time if occurred during the monitoring period. The CAR was closed.

Grade / Ref: CAR 4
Nature of the issue raised:
The Monitoring Plan Sheet did not include confirmation by the PPs to ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the final issuance of credits.

Nature of responses provided by the PPs:
The monitoring plan sheet has been revised. It is now indicates that data monitored and required for verification and issuance be kept and archived electronically for two years after the final issuance of credits.

Assessment of the responses:
The validation team confirmed that the revised MPS includes the above mentioned statement. The CAR was closed.

Grade / Ref: CAR 5
Nature of the issue raised:
The sheet MPS (input_separate) of the Monitoring Plan Sheet was not completed with the specific information of the individual transformers.

Nature of responses provided by the PPs:
MPS (input_separate) of the Monitoring Plan Sheet has been revised and now includes specific information of the individual transformers.

Assessment of the responses:
The PPs provided the sheet MPS (input_separate) completed with the information of the individual transformers and list of transformers as the supporting evidence. The unique identification number of the transformers Nos. 1 to 1,618 is corresponding to the manufacturer's equipment serial numbers. The type numbers of the transformers are corresponding to the type and capacity category numbers 1 to 19 shown in 3.1 of the Additional Information for the proposed methodology. The identification numbers of the power company are corresponding to the location numbers ① to ⑲ indicated in Section A.3. of the PDD. The information of individual transformers indicated in the MPS (input_separate) can be traced in the list of transformers. The validation team confirmed that the sheet MPS (input_separate) is completed with the relevant information of the individual transformers. Therefore the CAR was closed.

Grade / Ref: CAR 6
Nature of the issue raised:
The figure of the PDD Section C.2. does not indicate all the monitoring points for measurement with the monitoring point numbers and the type of equipment to be installed. The PPs should also clarify the most suitable positions of the monitoring points selected for collection of accurate data for the monitoring parameter.

Nature of responses provided by the PPs:
The project involves monitoring of the energizing time of the project transformers during the monitoring period. Counting of the number of hours in the monitoring period will be done at EVN SPC headquarter by the project participant. The PDD was revised to clearly indicate the monitoring point of the project.

Assessment of the responses:
The figure of the revised PDD Section C.2. shows monitoring points H1 to H1618.
The explanatory notes on the monitoring point clarified that the points are specified for individual transformers where the installation, operation, repair or replacement if conducted are confirmed and reported to EVN SPC for recording and determination of the energizing time. Energizing time of each project transformer will be adjusted based on the repair/replacement record if applicable. The CAR was closed.

Grade / Ref: CL 3
Nature of the issue raised:
The PPs were requested to clarify the measuring equipment to be used for the

parameter Hi,p. and to address how it will be calibrated.

Nature of responses provided by the PPs:
The counting of the number of hours in the monitoring period will be done by designating the starting date and the end date of the monitoring period. As a QA/QC procedure, project participants will ensure that the counting of the hours does not start before implementations and starting of the operation of all transformers under the project are completed. The date of completion of transformer implementation and the starting of the energizing of the transformers will be confirmed by reviewing the implementation completion report. The number of days in the monitoring period will be measured using the calendar and the number of hours in the monitoring period will be calculated by multiplying the number of days by 24hrs/day. No periodical calibration is required for calendar.

Assessment of the responses:
As above clarified by the PPs, counting of number of hours is made by determination of start and end days of energizing time during the monitoring period with interruptions to be adjusted if any based on the on-site confirmation of installation and operation of each transformer. Although the monitoring option is chosen as Option C in the approved methodology, no measuring equipment is involved and a calibration of the same is not applicable for the measurement methods. The counted number of days is multiplied by 24 hours/day to determine the number of hours during the monitoring period. Therefore, the number of operational days must be counted based on a full day of operation. The counting of day is conducted based on a calendar and there is no issue with accuracy of measurement. The validation team also referred to the similar monitoring methodology approved under the Clean Development Mechanism (CDM) AM0067 Version 02 for installation of energy efficient transformers in a power distribution grid, its application to the registered Programme of Activities (PoA) reference No. 9164 Installation of Energy Efficient Transformers (IEET) in Kenya and the Component Project Activity (CPA) No. IEET/CPA-001/KENYA/KPLC. The monitoring method is reasonble to the parameter as applied in the JCM methodology approved by the JC. The CL was closed.

Grade / Ref: CL 4
Nature of the issue raised:
The value of the blackout rate, the parameter Brp, is not obtained from the respective power company but the default value of the approved methodology is applied. The PPs were requested to clarify relevance of statement in the MPS.

Nature of responses provided by the PPs:
The applied methodology AM_005 fixes the blackout rate at 1.87% as the methodology default. The emission reduction calculation worksheet is not editable on this parameter. It is the understanding of the PPs that the default value provided within the methodology was established based on the data obtained from power companies. If there is any section in the PDD or in the MPS, the PPs will clearly states that the methodology default value of the blackout rate will be applied for the proposed project.

Assessment of the responses:
The Validation team considered the above clarification from the PPs and determined that application of the parameter Brp in the MPS follows the requirements of the approved methodology as the conservative default value is to reduce burden of the PPs to identify blackout rate for individual transformers and the value as well as the justification are fixed in the MPS form that cannot be altered by the PPs. The CL was closed.

Grade / Ref: CL 5
Nature of the issue raised:
The PPs were requested to clarify the organisational structures in the MSS for the implementation, monitoring and reporting of the JCM project.

Nature of responses provided by the PPs:
The MSS was revised to clearly describe the organizational structures for the implementation, monitoring, and reporting of the JCM project.

Assessment of the responses:
The PPs revised the MSS and clarified the organisational structures. The CL was closed.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed that the MP was described in compliance with the requirements of the approved methodology and the Guidelines for developing PDD and MR, and the PPs have demonstrated feasibility of the monitoring structure and their ability to implement the MP.

C.8. Modalities of Communication

<**Means of validation**>
The MoC was submitted to LRQA for review in the form JCM_VN_F_MoC_ver01.0 that nominates YUKO-KEISO Co., Ltd. as the focal point and was signed by the authorized representatives of all the PPs with the contact details. The form used is the latest one as of the time of validation.
The validation team assessed the personal identities including specimen signatures and employment status of the authorized signatories through directly checking the evidence for corporate and personal identity of the PPs and their authorized signatories. A CAR was raised since the relevant evidence was not submitted by the PPs at the start of the validation process that was subsequently closed as the resolution below detailed.
The validation team also confirmed through reviewing the corporate information of the PPs and by meeting the persons representing the PPs that the information provided in the MoC is correct.
<**Findings**>
Please state if CARs, CLs, or FARs are raised, and how they are resolved.
Grade / Ref: CAR 1
Nature of the issue raised:
Evidence for authorized signatories of the MoC was not presented for EVNSPC.

Nature of responses provided by the PPs:
The PPs provided supporting evidence for authorised signatories of EVNSPC.

Assessment of the responses:
The Validation team reviewed the supporting evidence provided by the PPs and confirmed that the signatories of EVNSPC are correctly indicated in the MoC that is completed with the personal identification and the signatures. The CAR was closed.
<**Conclusion based on reporting requirements**>
Please state conclusion based on reporting requirements.
The validation team confirmed that the MoC was completed using the latest form. A CAR was issued as above detailed and subsequently closed after assessment conducted on relevance of the MoC in compliance with the requirements of the JCM Guidelines.

C.9. Avoidance of double registration

<**Means of validation**>
The validation team assessed and confirmed relevance of the written confirmation in the MoC from the PPs that the proposed JCM project was not registered under the

other international climate mitigation mechanisms.
The team in addition to the interviews with the PPs checked publicly accessible information of Clean Development Mechanism (CDM), Joint Implementation (JI), Verified Carbon Standard (VCS), Gold Standard (GS) and the other schemes, and found no identical project as the proposed JCM project in terms of the name of entities, applied technology, scale and the location. The result of researches confirmed that the proposed project was not registered under the other international climate mitigation mechanisms than JCM and it will not result in a double counting of GHG emission reductions.
Particular attention was given to that there is an approved CDM methodology, AM0067 Methodology for installation of energy efficient transformers in a power distribution grid that might be applicable to the type of project. There was one CDM Programme of Activity (PoA) registered applying the methodology but it is implemented in Kenya and no similar project located in Vietnam.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was raised to the requirement of the section.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed that the proposed JCM project was not registered under the other international climate mitigation mechanisms.

C.10. Start of operation

<**Means of validation**>

The start date for the operation of the proposed JCM project is indicated as 01/01/2016 in the PDD.
The validation team confirmed correctness/relevance of the information by reviewing the supporting evidence and on site visit, including but not limited to assessing of the contracts, test reports and operation certificates, and that the date is not before 01/01/2013 as required to be eligible as a JCM project.

<**Findings**>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No issue was raised to the requirement of the section.

<**Conclusion based on reporting requirements**>

Please state conclusion based on reporting requirements.

The validation team confirmed through the on site assessment that the start date of operation of the proposed JCM project is 01/01/2016 and not before 01/01/2013 as

required to be eligible as a JCM project.

C.11. Other issues

<**Means of validation**> No issue was identified as relevant element not covered above. <**Findings**> *Please state if CARs, CLs, or FARs are raised, and how they are resolved.* Not applicable <**Conclusion based on reporting requirements**> *Please state conclusion based on reporting requirements.* Not applicable

D. Information on public inputs

D.1. Summary of public inputs

In line with the JCM Project Cycle Procedure, the PDD is to be made publicly available for 30 days to invite public comments. The PDD was made publicly available in line with the requirements of the procedure for the period of 19/02/2016 to 19/03/2016 as per https://www.jcm.go.jp/vn-jp/projects/15.

D.2. Summary of how inputs received have been taken into account by the project participants

A comment was received during the above period to receive public inputs. The PPs took account the comment to the validation requirements as below. Comment No. 1 Name: Mayur Karmarkar Affiliated Organization: ICA, Asia E-mail: mayurkarmarkar@copperalliance.asia Country: India Part of the document (A/B/C/etc): B Application of an approved methodology (ies) Page of the document: B2 Page 4 of 10 Input on the page: Criteria 3 – As the period of the project is for 18 years, there could be chances of transformer failures, disturbing core even during rewinding. This may change transformer losses, so propose to discount CO2 emission savings for repaired transformers for remaining period of the project. Propose to discount emission

reductions of 10% (As per tolerance limits specified in IEC60076 standard).

How the PPs took account the comment:
The public input suggests adding a new eligibility criterion to the applied methodology JCM-VN-AM005 in order to account for the uncertainty of the transformer losses associated with the long project life and the effects of repairs or the degradation over time.
Although the project proponent is not in the position for judging whether the current version of the methodology requires the revision in order to further address the uncertainty, the attached research paper "Development of distribution transformer based on new amorphous metals" indicates that the chance for the amorphous core to be degraded within the project life of 18 years is quite slim. According to the study, the lifetime of amorphous alloy used in the amorphous transformer is 550 years. The project proponent contacted the author of the research paper and confirmed that the possible damage of the transformer through repair can be detected at the time of testing after the repair and it is unlikely that the degraded transformer will be installed after the repair.
In addition, the current approved methodology ensures the conservative emission reduction by adopting conservative blackout rate for the methodology.
Furthermore, the project proponent is taking extra step to ensure net emission reduction by adopting following two approaches:
- Instead of individual test result of the no-load loss value, the project applies the maximum no-load loss allowed in the procurement requirement.
- The project applies the maximum uncertainty of 15% as per the IEC60076 standard for the allowable uncertainty for the no-load losses of the project transformers.

Assessment and conclusion: The validation team judged there is no doubt on authenticity of the public input and reviewed the contents of the public input and the response of the PPs with supporting evidence. The amorphous metal core has a lifetime of 550 years and its performance deterioration is very little over the time according to the research paper the clarification from the author of the same. The author also mentioned that in case a transformer is damaged, the transformer needs to be tested again to satisfy the quality standard before it is re-installed. The approved methodology provides a conservative default blackout rate and the maximum allowable uncertainty of IEC60076 at 15% is applied under the project so that the emission reductions are calculated in a conservative manner. Therefore, the validation team confirmed that the project design has taken account the points of the public input as

appropriate.

E. List of interviewees and documents received

E.1. List of interviewees

List of persons interviewed

YUKO-KEISO Co., Ltd.
Mr. Shiro Tokura, Director, System Service Department
Ms. Hiromi Kuroyanagi, System Service Department
TAKEO MATSUDA, Director, Yuko Vietnam Co. Ltd.

Mitsubishi UFJ Morgan Stanley
Ms. Chisato Nakade, Consultant, Clean Energy Finance Division

EVN-SPC
NGUYEN DAC THANG, EVN SPC Technical – Production Dept. Deputy Manager
HOANG TUAN ANH, EVN SPC Technical – Production Dept. Specialist
HO NGUYEN BICH NGAN, EVN SPC International Relation Specialist
TRUONG XUAN QUY, EVN SPC International Relation Specialist
TRAN THE DU, EVN SPC Investment Management Specialist

Long An PC
NGUYEN VAN LAM, Long An PC, Planning – Technical Dept., Deputy Manager
CAO NGUYEN BINH, Planning – Technical Dept., staff
HOANG TUAN LICH, Tan An Power Branch, Planning – Technical Dept Manager

THIBIDI
CAO HOANG PHAT, Vice General Director
PHAM NGOC BICH, Vice General Director
TRAN THI NGOC HANH, Specialist in Design Department
DANG MINH TRI, Deputy of QC Manager

E.2. List of documents received

Category A documents (documents prepared by the PP)
- PDD Version 1.0 dated 19/01/2016 with MPS/MSS
- PDD Version 2.0 dated 16/03/2016 with MPS/MSS
- Project outline
- Project idea note
- Outline of the electricity distribution grid and the map
- Information of 19 power distribution companies
- Monitoring and reporting structure
- Schedule for project implementation
- EVN SPC standard MBA-03_MBA 3P22/0,4kV (Code: EVN SPC-KTSX/QyD.114) and MBA-01_MBA 1P12,7/0,23kV (Code: EVN SPC-KTSX/QyD.114)
- Statutory useful life for the calculation of depreciation and amortization for machinery and equipment issued by Japan's Ministry of Finance
- Ministry of Finance Circular No. 45/2013/TT-BTC Guiding Regulation on Management, use and depreciation of fixed assets dated 25/04/2013
- Grid emission factor of Vietnam in 2013
- Law on Environmental Protection No. 55/2014/QH13 dated 23/06/2014
- Decree on Environmental Protection Planning, Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Plans
- Records of Local Stakeholders Consultation
- IEC60076-1 Power Transformers Part 1 General
- TCVN6306-1:2006 / IEC60076-1: 2000 Power Transformers Part 1 General
- List of transformers
- Test reports
- Operation certificates
- Response to the public input by the project participant
- Development of distribution transformer based on new amorphous metals, Paper to 20th International Conference on Electricity Distribution 2009
- Views of author of the research paper "Development of distribution transformer based on new amorphous metals"
- EVN-SPC Technical Specification for Amorphous Transformers
- Tender Specification MBA1P-G01-1
- Organisation Chart of EVN-SPC

Category B documents (other documents referenced)
- Approved Methodology VN_AM005 "Installation of energy efficient transformers in a

power distribution grid" Version 1.0

- Additional information for the proposed methodology "Installation of energy efficient transformers in a power distribution grid"
- Brochures for Amorphous Alloy Ribbon Metglas®. Hitachi Metals, Ltd.
- Company information of Tong Cong Ty Thiet Bi Dien Viet Nam Cong Ty Co Phan Thiet Bi Dien (THIBIDI)
- Standard for energy consumption performance by equipment manufacturers of transformers, the Ministry of Economy, Trade and Industries, Japan
- Decree No. 38/2015/ND-CP dated April 22, 2015 of the Government on the management of wastes and scraps
- Ministry of Natural Resources and Environment Circular No. 36/2015/TT-BTNMT on Management of Hazardous Wastes dated 30/06/2015
- Standards for judgment on manufacturers of energy consuming equipment concerning the improvement of the energy consumption performance of the transformer dated 27/12/2013, Ministry of Economy, Trade and Industry of Japan
- Feasibility Study Report for project to reduce transmission loss and greenhouse gas emissions by diffusion of high efficient amorphous transformers dated March 2011, Mitsubishi UFJ Morgan Stanley Securities Inc.
- Approved CDM Methodology for installation of energy efficient transformers in a power distribution grid AM0067 Version 02
- Programme of Activities Design DOcument (PoA-DD) for reference No. 9164 Installation of Energy Efficient Transformers (IEET) in Kenya and the Component Project Activity Design DOcument (CPA-DD) for reference No. IEET/CPA-001/KENYA/KPLC
- Approved Small Scale CDM methodology AMS II.A. Supply-side energy efficiency improvements – transmission and distribution Version 10
- J-Credit methodology for renewal of transformers EN-S-008 Version 1.0

Annex Certificates or curricula vitae of TPE's validation team members, technical experts and internal technical reviewers

Please attach certificates or curricula vitae of TPE's validation team members, technical experts and internal technical reviewers.

Certificate of Appointment is attached to this report.

Lloyd's Register
LRQA

Joint Crediting Mechanism Certificate of Appointment

Title of Project: Introduction of amorphous high efficiency transformers in power distribution systems in the southern part of Viet Nam

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the JCM project.

Name of Person	Assigned Roles
Michiaki Chiba	Team Leader
Stewart Niu	Team Member
Nguyen Tri Thang	Team Member
Xianxin Yan	Technical Reviewer

Signed by

[redacted]

Michiaki Chiba
Climate Change Manager – Asia & Pacific
25/11/2015