Gold Standard for the Global Goals

PILOT – VVB REQUIREMENTS

VALIDATION AND VERIFICATION REQUIREMENTS

PUBLICATION DATE **15.02.2025**
VERSION **Pilot 0.1**

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SUMMARY

These requirements establish essential qualifications, competencies, and professional experience for Validation and Verification Bodies (VVBs) assessing Digital Monitoring, Reporting, and Verification (DMRV) solutions under the dMRV pilot programme. The requirements are designed to ensure rigorous quality assurance in validation and verification, thereby maintaining the credibility of DMRV implementations and emission reductions/removals.
These requirements complement the current GS4GG Validation and Verification Standard (VVS) and Validation and Verification Body requirements, specifically addressing requirements for dMRV solution validation and verification.

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1| GENERAL REQUIREMENTS

1.1 | Auditor Qualifications and Competencies

1.1.1 | The audit team must include at least one member with proven expertise in assessing dMRV technologies.

1.1.2 | VVBs may engage external subject matter experts (SMEs) for specialized technical expertise beyond the core team's capabilities. Such engagements require documentation, and SMEs must fulfill relevant qualification requirements in their areas of expertise.

1.1.3 | The audit team must collectively possess technical competencies to evaluate the DMRV system, including:

a. Assess monitoring equipment suitability and data collection accuracy

b. Evaluate data management systems and ensure data integrity

c. Verify and validate emission reduction/removal calculations, and assess its accuracy and validity

d. Analyze technical documentation related to the DMRV system

1.2 | Key Areas of Expertise

1.2.1 | The following key areas of expertise are essential for VVBs to effectively assess and validate DMRV solutions, ensuring comprehensive evaluation of both technical and operational aspects:

a. **Sensor Technology:** Expertise in evaluating the functionality, calibration accuracy, and potential vulnerabilities of diverse sensor systems utilized in dMRV implementations.

b. **Data Management and Security:** Proficiency in assessing robust security protocols, data integrity mechanisms, and safeguards against unauthorized manipulation within dMRV systems.

c. **Data Analytics and AI:** Proficiency in evaluating complex algorithms, machine learning models, and statistical methodologies, with emphasis on identifying potential biases and systematic errors.

d. **Blockchain and DLT:** Comprehensive knowledge of distributed ledger technologies, focusing on their application in ensuring data immutability and transparent verification processes.

e. **Understanding of Relevant Standards and Guidelines:** Comprehensive knowledge of current standards, protocols, and regulatory frameworks governing dMRV implementations and digital verification methodologies.

2| VALIDATION REQUIREMENTS

2.1 | Scope of Validation

2.1.1 | An initial onsite inspection is mandatory before the first verification, ideally during validation when the dMRV system is operational, to verify monitoring equipment installation and data collection procedures.

2.1.2 | The validation process encompasses several key aspects that must be thoroughly assessed to ensure the dMRV system's reliability and effectiveness:

a. **Confirm Conformance:** Validate and Verify that solution design and implementation meet D-MRV protocol requirements, methodology standards, and guidelines.

b. **Assess Functionality:** Confirm the solution's capability to accurately capture, transmit, store, and process performance data, and generate reliable calculations, if applicable.

c. **Evaluate Reporting and Verification Capabilities:** Confirm the solution can generate automated reports and facilitate streamlined verification procedures.

d. **Ensure Security and Integrity:** Assess the solution's data security measures to prevent manipulation and ensure data integrity.

2.2 | Requirements

2.2.1 | The auditor shall validate the dMRV system either as part of overall project validation or as an independent assessment.

2.2.2 | The auditor shall validate implementation of dMRV system and its compliance with approved dMRV proposal, conditions outline in the decision and applied methodology requirements.

2.2.3 | The validation can be completed through either:

a. An on-site visit when both the project and dMRV system are operational, or

b. A pre-issuance inspection before the submission of request for performance review.

2.2.4 | The VVB shall assess whether the proposed DMRV solution complies with the applicable GS4GG methodology requirements and is suitable for the specific project context.

2.2.5 | The VVB shall conduct a comprehensive risk assessment to identify and evaluate potential vulnerabilities and implementation risks associated with the DMRV system.

2.2.6 | The VVB shall evaluate all relevant technical documentation, including but not limited to monitoring plans, data management protocols, and quality assurance procedures to ensure compliance with applicable requirements.

3| VERIFICATION REQUIREMETNS

3.1 | Scope of verification

3.1.1 | Once the DMRV solution is validated, periodic remote verifications replace frequent on-site inspections. On-site visits are required only every three years or when there are material changes to monitoring arrangements that require physical inspection of the monitoring and data collection systems, or when alterations to the validated DMRV solution need to be verified in person. The site visit as required by applicable GS4GG requirements supersedes these requirements.

3.1.2 | The verification process encompasses several key aspects that must be thoroughly assessed to ensure ongoing reliability and effectiveness of the dMRV system as outlined in requirements below.

3.2 | Requirements:

3.2.1 | The auditor shall verify the accuracy and completeness of the reported data, including cross-checking data from different sources and performing independent calculations.

3.2.2 | The auditor shall perform various cross-checks within the dMRV system, comparing reported data with secondary data sources. This could involve comparing:

a. Meter readings with invoices or sales records.

b. Actual performance data with theoretical maximum output calculations.

c. Data from the main meter with data from secondary meters or sensors.

3.2.3 | The auditor may conduct the remote audit if remote access to the dMRV database enables VVBs to

a. analyse the flow of monitoring parameters, verifying how data is captured, transmitted, stored, processed, and used for calculations.

b. review uploaded supporting documents, such as purchase orders, commissioning certificates, etc., to assess project implementation, operation and compliance with requirements.

3.2.4 | The auditor shall verify the calibration and maintenance records of monitoring equipment, ensuring compliance with requirements.

3.2.5 | The auditor shall verify the dMRV system and calculation/algorithm to verify the accuracy of emission reduction/removal calculations and assumption validity.

3.2.6 | The auditor shall evaluate the system's built-in quality control and quality assurance procedures to ensure data integrity, identify potential errors, and assess the system's ability to flag inconsistencies and any updates rolled out during monitoring period.

3.2.7 | The auditor shall conduct interviews to question project personnel and assess their understanding and adherence to operational and data collection procedures.

3.2.8 | The auditor shall assess the performance of the DMRV system over time and identify any potential issues or areas for improvement.

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