No. 233/1/2018-Wind
Government of India
Ministry of New and Renewable Energy
Wind Energy Division

Atal Akshaya Urja Bhawan,
CGO Complex, Lodi Road, New Delhi-110003
Dated: 29th October, 2025

OFFICE MEMORANDUM

Subject: Standard Operating Procedure (SOP) for Approved List of Models and Manufacturers – Wind (ALMM-Wind) and Approved List of Models and Manufacturers - Wind Turbine Components (ALMM-WTC) -reg.

In continuation of MNRE's O.M. of even no. dated 31.07.2025 regarding amendment to 'Procedure for inclusion/updating Wind Turbine Model in the RLMM (renamed as ALMM(Wind)), the Standard Operating Procedure (SOP) on the above cited subject is hereby issued for benefit of stakeholders and compliance.

2. This issues with the approval of competent authority.

(Rishikesh Vaishnav)
Scientist 'C'

To
All concerned

Copy to:

i. Sr. PPS to Secretary, MNRE
ii. PPS to Joint Secretary (Wind), MNRE
iii. PA to Director (PKD), MNRE

Standard Operating Procedure

for

Approved List of Manufacturers and Models for Wind Turbines (ALMM-Wind)

and

Approved List of Manufacturers and Models for Wind Turbine Components (ALMM-WTC)

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SOP for ALMM-Wind and ALMM-WTC

1.0 Introduction

The Approved List of Models & Manufacturers for Wind (ALMM-Wind) is a list of type and quality certified wind turbine models that are eligible for installation in the country. This list is issued to facilitate State Nodal Agencies (SNAs), investors, lenders, and developers. The ALMM-Wind is based on type testing, type certification and quality assurance of wind turbines, as per the Guidelines for Development of Onshore Wind Power Projects issued by this Ministry on October 22, 2016 and Procedure to apply for inclusion of a Wind Turbine Model in the Revised List of Models and Manufacturers of Wind Turbines (RLMM) dated 1st November, 2018 along with subsequent amendments.

As per the amendment to 'Procedure for inclusion/ updating Wind Turbine Model in the Revised List of Models and Manufacturers of Wind Turbines (RLMM)' dated July 31, 2025, the RLMM is renamed as Approved List of Models and Manufacturers (Wind) i.e. ALMM (Wind) and the Type Certificate of a wind turbine model must mandatorily include the vendors and sources for blade, tower, generator, gearbox, and special bearings (Main, Pitch, and Yaw Bearing). Further, this amendment mandates data control and research centre within India to address the cyber security issues. A separate list named Approved List of Models & Manufacturers for Wind Turbine Components (ALMM-WTC), will be issued for these components after a comprehensive inspection of the manufacturing facilities of the component suppliers. This inspection will verify the manufacturing Infrastructure, Capacities, capabilities and quality assurance processes to ensure they meet the standards required for inclusion in the ALMM-WTC list.

2.0 Scope

This Standard Operating Procedure (SOP) governs the process for all entities applying for enlistment in either the ALMM-Wind or ALMM-WTC.

The Type Certificate of a wind turbine model, issued by an accredited Type Certification Body (CB), serves as the foundational scientific and technical

documentation for a wind turbine's eligibility for enlistment in the ALMM-Wind. This Type Certificate must explicitly include an approved and the associated list of major components, including the blade, tower, generator, gearbox, and special bearings (Main, Pitch, and Yaw Bearing).

Enlistment of components in the ALMM-WTC list is dependent upon inclusion in an approved wind turbine Type Certificate & RLMM-Wind, submission of a valid, independent component certificate and subsequent inspection by a designated team. This ensures a direct and verifiable link between the component and its certified performance within a specific wind turbine model.

3.0 Pre-Application Requirements by the Applicant

- **Type Certification:** The applicant must possess a Full Type Certificate or a Provisional Type Certificate without any safety related outstanding issues for the wind turbine model and all associated documents.
- **ISO Certification:** The applicant must demonstrate compliance with relevant ISO standards.
- **Technical Documentation:** The applicant is required to submit all relevant technical documents that have been issued by the accredited Type Certification Body.

4.0 The ALMM-Wind and ALMM-WTC Enlistment Process:

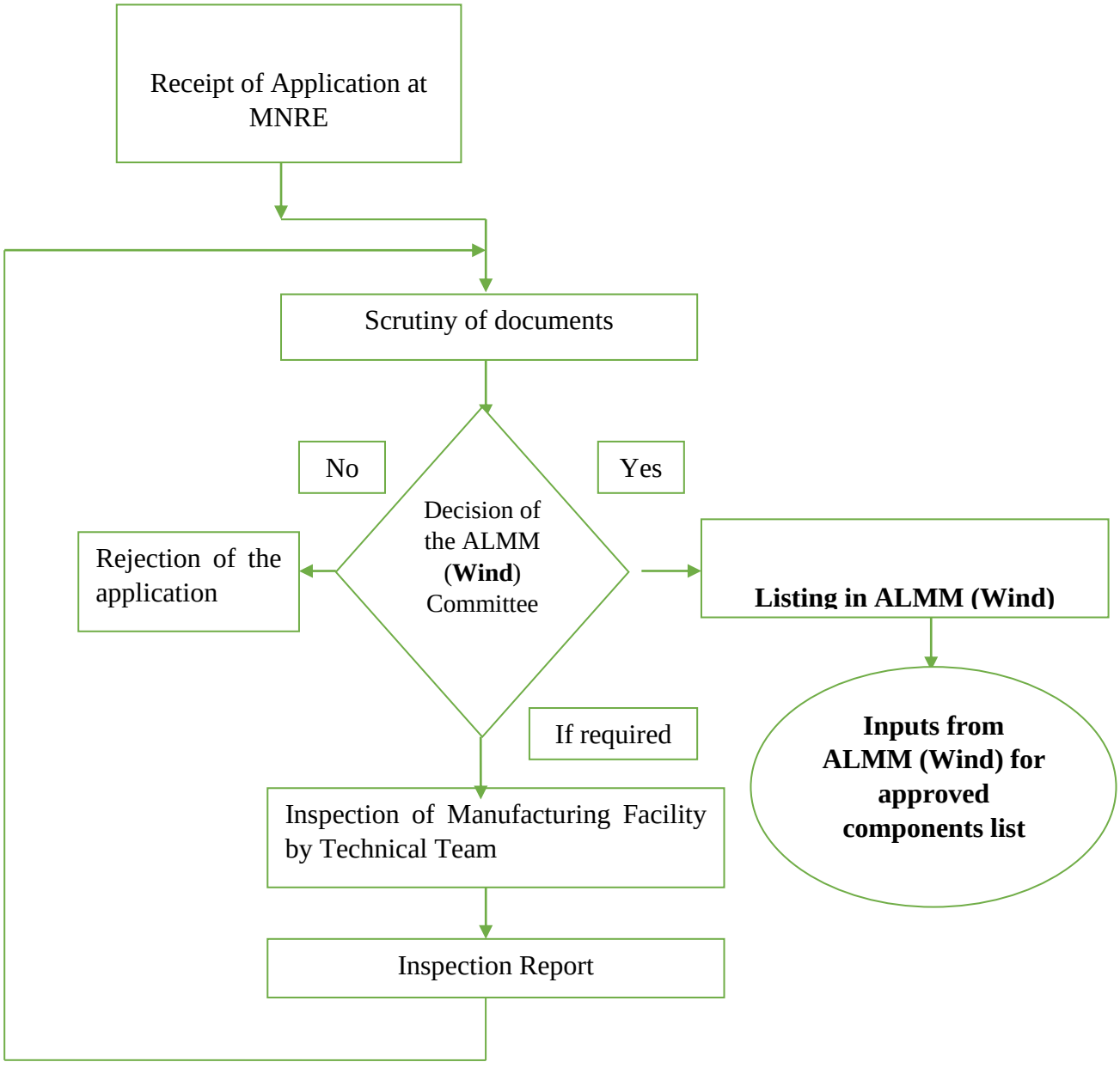
This section outlines the complete process flow, from initial application to final enlistment, for both wind turbine models (ALMM-Wind) and major components (ALMM-WTC). This multi-stage procedure is designed to ensure technical compliance and quality assurance to safeguard interest of various stakeholders including consumers, Grid operators, Funding agencies, State & Central Govt. Agencies etc.

4.1 The ALMM-Wind Enlistment Process

The process for a wind turbine model to be listed in ALMM-Wind will be initiated with receipt of a complete application from a manufacturer, which includes the valid Type Certificate issued by Accredited Type Certification Body, Conformity Statements, Final Evaluation Report and Certified Power Curve, and ISO Certificates. The

ALMM-Wind Committee will conduct a thorough scrutiny of these documents against the requirement of Applicable guidelines and Standards.

- **Committee Decision:** Based on the document scrutiny, the committee will make a recommendation for;
    - **Listing:** If the application is compliant in all respect.
    - **Submission of additional documents/clarification:** If, the minor noncompliance can be closed by the applicant within a weeks' time.
    - **Rejection:** If the application is incomplete or non-compliant having major deficiency or compliance requirements.



A wind turbine model's enlistment in ALMM-Wind is valid in conjunction with its approved list of components in ALMM-WTC, except for projects that qualify for exemption under the OM No. 233/1/2018- Wind dated 31st July 2025, Para 2(a), 2(b) and 2(c)(i).

The approved component list from the Type Certificate of the listed wind turbine model will serve as the official input to the ALMM-WTC process.

4.2 The ALMM-WTC Enlistment Process

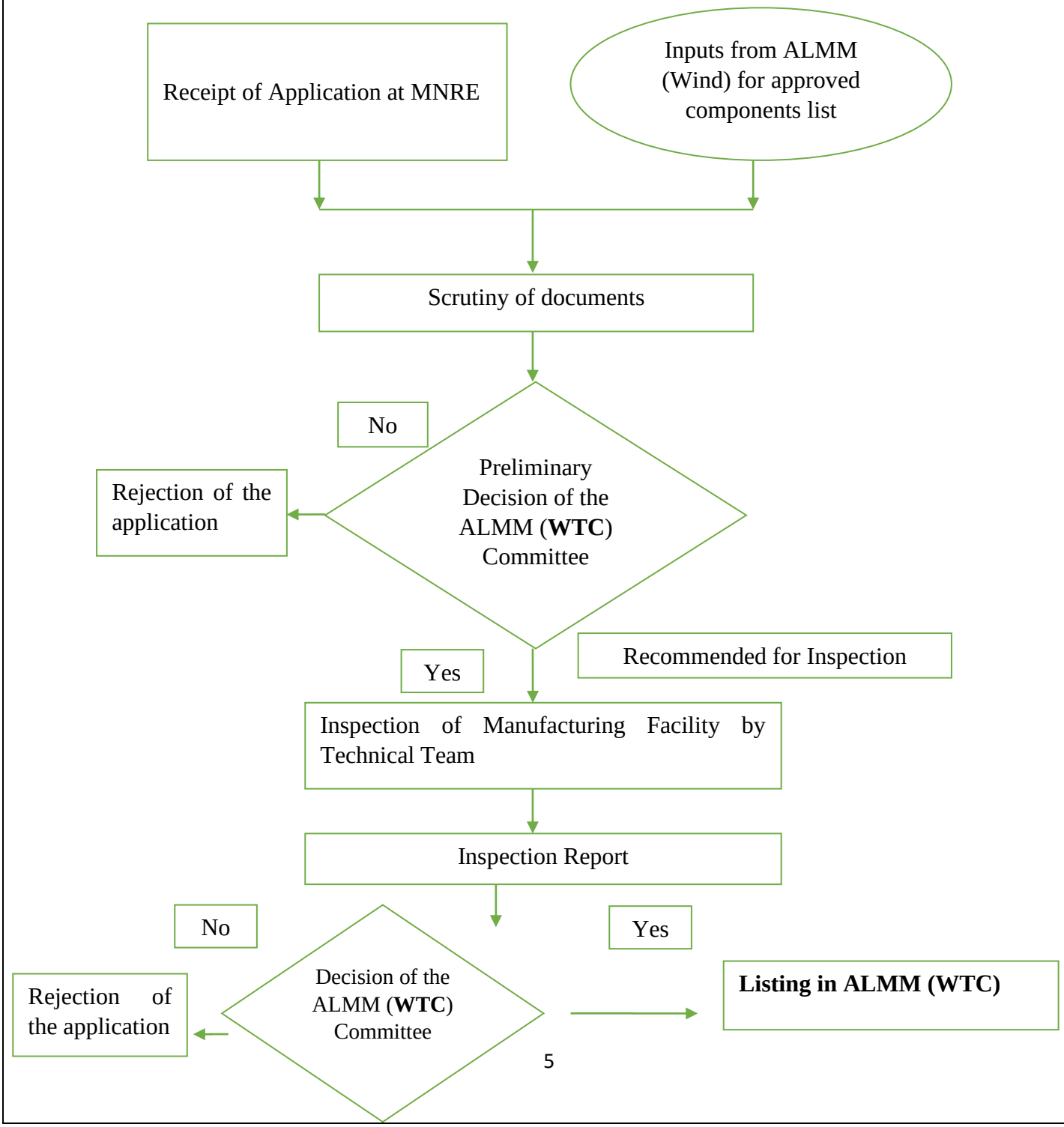
This process governs the enlistment of major wind turbine components, including blades, special bearings (main, pitch and yaw bearing), gearboxes, generators, and towers, into the ALMM-WTC (List 2). The objective is to verify that the manufacturing and assembly facilities of these components to meet the required standards.

- **Application & Document Scrutiny:** The process begins with the receipt of an application, which includes Wind Turbine Type Certificate, Component Certificate, ISO Certificate and documentation (as per annex-2), at MNRE with a copy to NIWE. The ALMM-WTC Committee will scrutinize the documents and review the inputs received from the approved component list of ALMM-Wind.
- **Preliminary Decision of the Committee:** Based on the document scrutiny, the committee will make a recommendation for;
    - **Factory Inspection:** If the application is compliant from documentation angle.
    - **Submission of additional documents/clarification:** If, the minor noncompliance can be closed by the applicant within a weeks' time.
    - **Rejection:** If the application is incomplete or non-compliant having major deficiency or compliance requirements.

- **Inspection:** A physical inspection is a critical regulatory verification step. It is conducted by a Technical Team (Inspection Team) constituted by MNRE in addition to the manufacturing evaluation performed by the accredited Type Certification Body (CB). The inspection team verify that the manufacturing facility consistently adheres to the certified processes and quality controls.

The inspection shall be carried out as per the requirements of ISO/IEC 17020 & relevant standards. In addition, the inspection team may record the key value addition steps, as deemed appropriate, that are being carried out by the manufacturer.

- **Final Review & Listing:** Following a successful inspection, the Technical Team submits a detailed report. The ALMM-WTC Committee will review this report provide recommendation for listing of the component's manufacturer and model in the ALMM-WTC.



A component of any wind turbine model (i.e., blade, special bearings (Main, Pitch, and Yaw Bearing), gearbox, generator, and tower) shall be authorized for installation in the country only after its manufacturer and model have been formally listed in ALMM-WTC, except for projects that qualify for exemption under the OM No. 233/1/2018- Wind dated 31st July 2025, Para 2(a), 2(b) and 2(c)(i).

To facilitate all stakeholders, the MNRE will publish and regularly update the approved list of components for all models listed in ALMM-Wind. The list will be updated on MNRE website. The inspection team may also carry out surveillance inspection post enlistment of the component in the ALMM-WTC.

5.0 Application Submission

The formal process for enlistment in the ALMM-WTC list is initiated by the applicant's submission of an application to Ministry of New & Renewable Energy (MNRE). MNRE may also develop a portal for such applications. This submission must be completed in its entirety and include all required technical and administrative documents as specified in the application checklist. A non-refundable application fee, as detailed in the Section 10.0, is also required at the time of submission. The successful submission and payment mark the official commencement of the review process.

6.0 Document Scrutiny

The ALMM-WTC Committee, a dedicated body appointed by the MNRE, will conduct a comprehensive review of all submitted application and documents to verify their completeness and compliance with the specified requirements. This scrutiny serves as the basis for a preliminary decision on the application.

During this stage, the committee will perform the following actions:

1. **Verification of Prerequisites:** The committee will first verify that a valid Type Certificate for the wind turbine model, issued by an accredited Type Certification Body (CB), has been submitted. This Type Certificate is a mandatory prerequisite for any component to be considered for listing.
2. **Compliance Check:** A detailed technical and administrative check will be performed to ensure all documents, including the Type Certificate, ISO

certifications, and other technical data, are complete and align with the technical specifications and standards outlined in this SOP.

3. **Preliminary Decision:** Based on the outcome of the document scrutiny, the ALMM-WTC Committee will make a preliminary decision. If all documents are complete and compliant, the committee will recommend for a physical inspection of the manufacturing facility. An inspection team will be formally constituted to conduct the on-site verification.

The application will then proceed to the next stage of the process as per the committee's decision.

7.0 Types of ALMM-Wind Applications: New Enlistment and Variants

The ALMM framework distinguishes between a "New Model" and a "Variant" to ensure the list reflects substantive technological differences and to prevent the unnecessary proliferation of entries based on minor design modifications.

7.1 New Enlistment: Definition of a New Wind Turbine Model

A **New Wind Turbine Model** is defined as a specific turbine design that requires its own distinct enlistment in the ALMM-Wind list. A single wind turbine model may, however, be certified under the same Type Certificate (TC) even with alternate components and configurations. These permissible variations include changes to hub height, wind class, tower type, power converter type, output voltage, cut-in and cut-out wind speeds, survival wind speed, ambient temperature range, power de-rating, noise emission levels, and grid compliance settings.

Notwithstanding these acceptable variations, a wind turbine model shall **not** be considered for registration as a new model in the ALMM-Wind list if it meets the following criteria:

- **Rotor Diameter and Rated Power:** It exhibits a rotor diameter variation of less than 2% and/ or a rated power variation of less than 10% when compared to an already-listed wind turbine model under the same manufacturer or designer, within a similar range of rotor diameter and rated power.

However, a wind turbine model may be considered for registration as a new model if it incorporates a distinctly different design architecture. This includes, but is not limited to, a significant change in:

- **Aerodynamic Design:** A significant change in the blade's aerodynamic profile, material composition, or structural design that substantially alters the power curve, noise emissions, or certified load conditions.
- **Generator Technology:** e.g., Direct-Drive Permanent Magnet Synchronous Generator (PMSG) versus Doubly-Fed Induction Generator (DFIG).
- **Control Strategy:** e.g., Pitch-controlled versus Stall-controlled systems.
- **Drive Train Configuration:** e.g., Geared versus Direct-Drive systems.
- **Design Lifetime on account of design change in the components:** e.g., a change from a 20-year to a 25-year design lifetime.

This determination must be supported by complete and independent design documentation as validated by an accredited Type Certification Body.

New Wind Turbine Model will be given exemption for meeting the requirements related to sourcing of major components, including the blade, tower, generator, gearbox, and special bearings (Main, Pitch, and Yaw Bearing) from the ALMM (WTC) list, limited to 800 MW within a maximum period of two years from the date of enlistment in ALMM (Wind) list. Further, the models of major wind turbine components, including the blade, tower, generator, gearbox, and special bearings (Main, Pitch, and Yaw Bearing) already given exemption for a particular new wind turbine model will not be considered for re-exemption in a separate new wind turbine model enlisted/to be enlisted by the same manufacturer.

7.2 Variants (Updation of Existing Wind Turbine Models)

A **Variant** is defined as any modification to an existing, enlisted wind turbine model that does not meet the stringent criteria for a "New Model" as defined in Section 7.1.

Notwithstanding the issuance of a new Type Certificate for a minor change, any modification that falls below the following thresholds will be mandatorily classified as an updation of an existing model:

- **Rated Power and Rotor Diameter:** A rated power variation of less than 10% and/ or a rotor diameter variation of less than 2% when compared to an already-listed wind turbine model under the same manufacturer, within a similar range of rotor diameter and rated power.

Changes that fall under the "permissible variations" within the same Type Certificate (e.g., hub height, wind class, etc.) will also be treated as an updation to the existing model entry. The committee reserves the right to re-classify an application as a variant if it determines that the changes are not substantive enough to qualify as a new model based on the technical criteria in Section 7.1, regardless of the new Type Certificate.

8.0 Types of applications for ALMM (Wind)

8.1 Application for New Enlistment of Wind Turbine Model and Manufacturer

When a new wind turbine manufacturer applies for enlistment in ALMM-Wind, the Type Certificate (TC) issued by an accredited Type Certification Body (CB) serves as the primary basis for the new enlistment with an approved list of associated components. The wind turbine model will be recommended for listing in ALMM-Wind only after a successful review of the documents attached as Annexure 1 by the ALMM-Wind Committee.

The committee's deliberation will focus on a comprehensive technical and qualitative review of the proposed wind turbine model, based on the documents submitted by the applicant. This deliberation is structured around three key areas:

- **Technology & Design Architecture:** The committee will examine critical aspects of the technology type, including the generator type, drive train configuration, control systems, tower type, wind turbine class, and other relevant technical parameters.
- **Innovation & Documentation:** The committee will evaluate any innovative features, consider references to intellectual property or patent filings, and

scrutinize any deviations from the type-certified design to ensure they are clearly explained and supported by the application.

- **Manufacturing & Quality Assurance:** The committee will verify the ISO certifications for the manufacturing and assembly facilities of all major components including the hub, nacelle, blade, tower, generator, gearbox, and special bearings (main, pitch, and yaw bearings) as documented in the Type Certificate and supported by the relevant ISO certificates submitted by the applicant.
- **Performance Efficiency and Safety Issues:** The committee will deliberate on the turbine's performance, ensuring the power curve has been tested and certified by an accredited laboratory in accordance with IEC 61400-12-1 and that all supporting performance data aligns with regulatory expectations including performance in representative geographical conditions. Mandatory prototype testing within India.

The new turbine model may be considered for enlistment based on the committee's recommendations and a successful review of the inspection report submitted by Technical Team, where an inspection is required.

8.2 Application for Enlistment of a New Wind Turbine Model by a Manufacturer Already on the ALMM-Wind List

When a wind turbine manufacturer already having models enlisted in ALMM-Wind applies for the enlistment of a new wind turbine model, the committee will deliberate on the application based on the criteria for "New Enlistment" as stated in Section 8.1.

In addition, the ALMM-Wind Committee shall specifically evaluate the application to distinguish between a new wind turbine model and a variant, with reference to the definitions provided in Section 7.1 and 7.2 of this SOP. The committee will ensure that the proposed model adheres to the following principles:

- **Distinguishing a New Model from a Variant:** The committee will verify that the proposed model is not a minor configuration change. As per Section 7.1, a new model will not be registered if it exhibits a rotor diameter variation of less than 2% *and/ or* a rated power variation of less than 10% when compared to

an already-listed wind turbine model from the same manufacturer, within a similar range of rotor diameter and rated power.

- **Review of Design Architecture:** The committee will assess if the model incorporates a distinctly different design architecture, such as a change in generator technology (e.g., DFIG vs. PMSG), control strategy (e.g., pitch vs. stall), drive train configuration, or design lifetime (e.g., 20 to 25 years). This determination must be supported by complete and independent design documentation.

The committee will also review the "permissible variations" (e.g., changes to hub height, wind class, tower type, etc.) as outlined in the Type Certificate to ensure they are appropriately classified as a variant and do not meet the criteria for a new model.

8.3 Application for Updation of a Wind Turbine Model

When a manufacturer already enlisted in ALMM-Wind applies for an updation, the revised Type Certificate (TC) for the wind turbine model, issued by an accredited Type Certification Body (CB), serves as the basis for the application. The ALMM-Wind Committee will deliberate on the application, referring to the definitions for a "New Model" and "Variant" as outlined in Sections 7.1 and 7.2 to ensure the modification is appropriately classified.

The committee's deliberation will specifically focus on a comparative review of the revised Type Certificate against the previously submitted documentation. The key aspects to be reviewed include:

- **Certification and Accreditation:** Any change in the Type Certification Body and its accreditation status.
- **Component Changes:** Any changes to major components or their vendors/sources, including blades, towers, generators, gearboxes, and special bearings (main, pitch, and yaw bearings).
- **Manufacturing Facility Status:** The status of the manufacturing and assembly facilities for the hub, nacelle, and all major components as reflected in the revised Type Certificate documentation.

- **Performance Changes:** Any changes made to the certified power curve documentation or other performance parameters that were previously submitted.

Based on this review, the committee will determine if the updation is compliant and whether it meets the criteria as defined in Section 7.1/ 7.2 of this SOP.

8.4 Application for updation of revised documents including ISO certificate (Other than type certificate documents)

This process applies when a manufacturer already enlisted in ALMM-Wind submits revised documentation other than a Type Certificate (TC). This typically includes updated ISO certificates or other administrative and technical documents.

The ALMM-Wind Committee will deliberate on the application with the following key objectives:

- **Comparative Review:** A detailed review of the revised documentation will be conducted and compared with the documents previously submitted to the committee.
- **ISO Certificate Verification:** In the case of a revised ISO certificate, the committee will verify its impact on the status of the manufacturing and assembly facilities for all major components, including the hub, nacelle, blades, towers, generators, gearboxes, and special bearings (main, pitch, and yaw bearings), against the details in the original Type Certificate documentation.
- **Accreditation Status:** The committee will deliberate on any changes to the ISO certification body, including its accreditation status, to ensure continued compliance with established standards.

The committee's final decision will be based on a verification that the updated documents do not introduce any non-conformities and that the manufacturer continues to meet all quality and procedural requirements.

9.0 Types of Applications for ALMM-WTC

a. ***New Enlistment of a Component:***

This category applies when a new manufacturer applies for enlistment of a component in the ALMM-WTC list. The Type Certificate of a wind turbine model, issued by an accredited Type Certification Body (CB), serves as the basis for the application. The associated components listed in the TC are reviewed for potential enlistment in ALMM-WTC. The recommendation is subject to a successful review of the documents (as per Annexure 2) by the ALMM-WTC Committee and successful review of the inspection report submitted by the technical team.

b. ***Updation of a Component:***

This applies when a manufacturer already enlisted in ALMM-WTC seeks to update a component. The revised Type Certificate of a wind turbine model issued by an accredited CB is the basis for the updation. The associated components mentioned in the revised TC will be recommended for listing in ALMM-WTC subject to a successful review of the documents (as per Annexure 2) by the ALMM-WTC Committee and successful review of the inspection report submitted by the technical team.

9.1 Verification of Documents and Non-Conformities

The ALMM-WTC Committee will conduct a thorough review of all submitted documents. Any non-conformities identified during this review will be formally communicated to the manufacturer and the technical team. The manufacturer and technical team is responsible for closing all non-conformities and submitting a closure report. The final closure report will be submitted to the committee for a final review and recommendation for listing.

10.0 ALMM-WTC Inspection of a Manufacturing/Assembly Facility

The inspection of a manufacturing or assembly facility is conducted by a technical team in accordance with the requirements of ISO/IEC 17020 and other relevant national and international standards. This inspection is a critical regulatory step to verify that the facility is capable of consistently producing components to certified

standards. The fee for the inspection of a single wind turbine component type is ₹1.5 lakhs plus taxes, excluding travel and logistics expenses.

The inspection requirements for the manufacturing and assembly facilities of major wind turbine components, including hub and nacelle assembly, blades, towers, generators, gearboxes, and special bearings (main, pitch, and yaw bearings), are as follows:

- **General Facility Details:** The inspection will confirm the facility's legal and operational status, including its address, valid factory license, ownership, monthly production capacity, number of shifts, manpower strength & Capabilities land and shop floor area, and safety practices. The specific wind turbine models being produced and the list of in-house versus bought-out components will also be verified.
- **Production Capabilities:** The inspection will assess the availability and adequacy of manufacturing equipment, tools, jigs, fixtures, and material handling systems. Component-specific processes such as welding, machining, heat treatment, surface treatment, or composite layup will be evaluated as applicable.
- **Quality Control and Assurance:** The facility must demonstrate the presence of robust quality control instruments and processes. This includes verifying procedures for dimensional inspection, non-destructive testing (NDT), material traceability, and process control. All relevant ISO certifications and quality protocols will be examined.
- **Testing Infrastructure:** The technical team will review the facility's component-specific testing capabilities, such as static, dynamic, and functional tests conducted in-house. Test procedures, reports, and the calibration of all testing equipment will be examined.
- **Lifting and Handling Systems:** The availability and operational status of adequate lifting equipment, including overhead cranes, mobile cranes, and forklifts, will be verified to ensure they are appropriate for component weight and geometry.