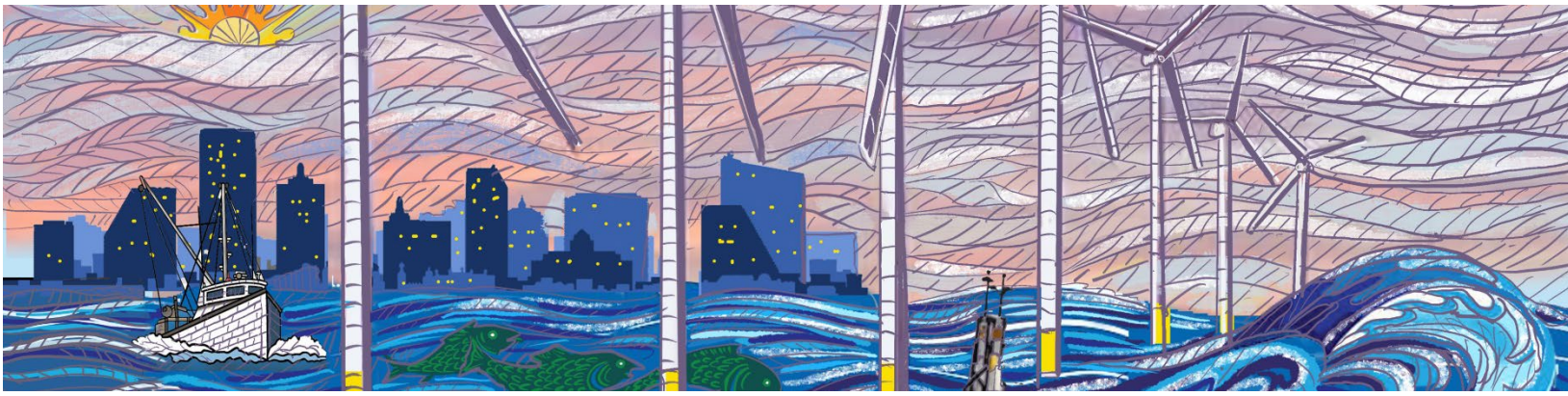


Appendix I-F2

Project 1 CVA Statement of Qualifications

May 2024

CVA Statement of Qualifications

For Atlantic Shores Wind Project

Bureau Veritas North America

Rev.01 – 08/15/2023

INTRODUCTION

Atlantic Shores Offshore Wind, LLC (the "Customer") has invited Bureau Veritas North America (BVNA) to present this Statement of Qualifications (SOQ) for Certified Verification Agent (CVA) services for the Atlantic Shores Wind Project (the "Project").

To gain approval for an offshore wind farm, United States (U.S.) regulations require that an independent third party is appointed to certify the design, fabrication, installation and commissioning to the Bureau Of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE). BV's Renewables Certification (RC) division has been active as a certification agency from the very beginning of the European offshore wind industry.

The offshore wind facility's developer for approval by BOEM/BSEE nominates the CVA, on behalf of which the CVA performs its activities. The CVA duties outlined in the U.S. Code of Federal Regulations (CFR) match very well with the systems and schemes applied for in the approval and certification of offshore wind farms in Europe. This is not a coincidence as the CFR and European regulations on offshore wind both evolved from the offshore oil and gas industry.

Bureau Veritas (BV) proposed approach will focus on verification of design, fabrication, and installation phases in accordance with applicable codes and standards and with a focus on the International Electrotechnical Commission (IEC) 61400-22 standard and applicable codes and standards as required in the recently published ANSI/ACP OCRP-1-2022, The American Clean Power Association Offshore Compliance Recommended Practices (OCRP) Edition 2.

BV has a strong presence across the U.S. with offices on the east and west coasts as well as a Houston office with U.S.-based offshore experience and trained offshore surveyors. These U.S. personnel are strongly supported by BV's RC team in Europe, which provides experience from certification activities performed for most offshore wind farms under design, fabrication, installation, commissioning and operation phases.

BV is staffed with many technical experts working with certification of offshore wind farms and normally engages in more than 10 offshore wind farms simultaneously. Hence, BV can run multiple CVA projects simultaneously. A similar approach could be applied to the fabrication and execution phases as BV also has a large pool of surveyors spanning many countries.

With reference to 30 CFR 285.706 (b) (1 – 7), as well as (c) and (d), below is the required information for the CVA nomination of BVNA towards BOEM/BSEE for the Atlantic Shores

Offshore Wind Project. This information is complemented by the CVA Verification Plan submitted in the COP application as a separate document.

As a pre-requisite for the understanding of the project team set-up and organization, a description of BV's structure including its affiliates relevant for the CVA work as well as Marine Warranty Surveyor is included in Appendix 1.

A qualification statement demonstrating that BV has a formal structure in place to conduct Project Certification activities is given in Appendix 2. Certificates referenced in Appendix 2 are given Appendices 2.1 to 2.3, namely BV's accreditation according to ISO/IEC 17065 and the ISO 9001 certificate as well as the Certificate of Acceptance to participate in the IECRE - IEC System for Certification to Standards relating to Equipment for use In Renewable Energy Applications.

Finally, BV's corporate Environmental, Health and Safety Policy is provided in Appendix 2.4.

CVA QUALIFICATIONS:

Bureau Veritas' compliance with CVA qualification requirement according to 30 CFR 285 Subpart G § 285.706 (b) (1 – 7), as well as (c) and (d), is demonstrated as following:

Previous experience in third-party verification or experience in the design, fabrication, installation, or major modification of offshore energy facilities:

BV and its subsidiaries have more than 190 years of experience in the Marine industry, 40 years in the Offshore Oil & Gas industry, and 20 years in the wind industry, which includes certification of offshore wind projects installed or under construction worldwide. A summarized overview about our project certification experience can be found in Appendix 3.1.

Technical capabilities of the individual or the primary staff for the specific project:

BV plans to draw from our deep bench of highly qualified engineers to provide a team of technical experts with extensive experience in offshore wind, wind turbine technology, structural engineering, offshore oil & gas engineering, maritime surveying, and other relevant disciplines. The proposed CVA team will include personnel and project managers who have been actively involved in CVA Projects for offshore wind. BV intends to manage the Project with U.S.-based staff and the technical work will be conducted by a team consisting of staff from France, Germany and the U.S., providing local service while ensuring BV's work is informed by our extensive experience from Europe.

The proposed CVA Team includes staff qualified in the range of disciplines that will be required for completing the proposed scope of work. The following technical areas are covered by the CVA team:

- Wind conditions and site assessment

- Metocean conditions and hydrodynamic loads and scour
- Wind turbine wind loads and load cases, assessment and load validation, power performance testing, noise measurements
- Control and protection system
- Fiber reinforced plastic (FRP) structures (blades and hub and nacelle covers) incl. testing
- Main gear
- Mechanical systems
- Mechanical structural components
- Geotechnical assessment and foundation/soil interaction
- Electrical system including testing of power quality, electromagnetic compatibility (EMC)
- Grid code compliance including testing
- Steel support structures including corrosion protection
- Manufacturing evaluation / manufacturing surveillance
- Transportation & Installation surveillance
- Commissioning surveillance incl. safety and function test
- Inspection of wind turbines
- Offshore substation risk assessment, HAZID, fire protection and safety
- Project management level and manuals
- Condition monitoring systems, fire protection (wind turbine), training systems, service providers

Size and type of organization or corporation:
A description of BV's structure relevant for the CVA and Marine warranty Surveyor work is included in Appendix 1. Some information about the BV Power & Utilities division as well as its standing within the corporate structure of BV can be found in Appendix 5.

In-house availability of, or access to, appropriate technology (including computer programs, hardware, and testing materials and equipment):
BV has access to several computer programs for undertaking any complex independent analysis. Software validation and documentation information are provided below.

- SAMCEF Equivalent to HAWC and Bladed
- Isymost NSO Equivalent to SESAM
- ANSYS Classic/Workbench

Further tools and equipment required for the fabrication and installation review are available. These are mainly:

- Personnel Protective Equipment such as safety shoes, glasses and gloves, high visibility vests, helmets, fall protection, ear protection as well as survival suits and life vests for offshore activities (typically rented for the specific activity).
- Smaller equipment and measuring tools such as cameras, construction survey equipment, measuring tapes, weld gauges, pocket lamps, etc.

Ability to perform the CVA functions for the specific project considering current commitments:
The proposed project team has been chosen under due consideration of the proposed project timeline as well as other project commitments and the ongoing business. Therefore, we have accounted for redundancy for the different required skills and can reinforce the team with additional technical resources as needed to cover potential busy project times such as the facility design review. As also shown, the senior management is fully supporting the CVA work and can prioritize tasks towards project review activities if required. Finally, we are prepared to include further resources, especially local inspectors for the fabrication and installation review in due course.

Previous experience with BOEM requirements and procedures:
BVNA's US based team is well connected to BOEM and provided CVA services for the US Oil & Gas industry per 30 US CFR 250. BV was nominated CVA by BOEM for another Offshore Wind Project in the US East coast.

BV has met with BOEM representatives over the last calendar year to present our capabilities and to understand requirements for CVA nomination. We further aligned on the basic expectations of BOEM for the scope of work and CVA deliverables.

Finally, specific senior team members have participated in the U.S. Offshore Wind Standards Initiative. The goal of this initiative is to establish a set of U.S. National standards/guidelines for offshore wind that BOEM/BSEE could use to help provide more guidance and transparency to the regulatory process.

The level of work to be performed by the CVA:
Detailed descriptions of the level of work to be performed to fulfil the duties of the CVA as outlined in 30 CFR 285 Subpart G §§ 285.707 – 708 are given in the CVA Verification Plan.

Conflict of Interest
Regarding "***Rule c) CFR §285.706: Individuals or organizations acting as CVAs must not function in any capacity that will create a conflict of interest, or the appearance of a conflict of interest"***

It is noted that outside of the contract to provide CVA services for the Atlantic Shores Wind Project, BV or any of its employees and or family members is not affiliated with Atlantic Shores Offshore Wind, LLC in any capacity. Atlantic Shores Offshore Wind, LLC is not aware of any function performed by BV that would create a conflict of interest or the appearance of a conflict of interest. BV has successfully met this requirement on all the past independent engineering and certification projects.

Qualification Matrix and Professional Engineer Supervision:

Regarding "***Rule d) CFR §285.706: verification must be conducted by or under the direct supervision of registered professional engineers***", it is noted that:

- The proposed CVA team includes several BV employees who are registered professional engineers in the Civil, Structural, Mechanical, Electrical and Safety disciplines.
- BV has its own Quality System Certification Scheme (QSCS) in accordance with IACS Procedures, Volume 3, which requires the assignment of professionals with required competence to oversee and/or execute the project activities. The BV internal procedure "PRT WT 001 - Qualification of evaluators for Certification of Wind Turbines, Wind Turbine Components and Wind Turbine Projects" that fulfils the general requirements relative to product certification bodies mentioned in the standard NF EN ISO/IEC 17065, can be found in Appendix 6.
- Verification work will be performed analogous to an accredited service with staff qualified through a qualification matrix. The requirement per §285.706 (d) for the verification to be conducted by or under direct supervision of a registered PE, will be executed in addition to the requirement by the accreditation.
- The CVA will issue Evaluation Reports for the FDR and FIR. Drawings, BV's Comment Sheets and Evaluation Reports will be reviewed by PE's. Supplementary background information will be provided to the PE if required and updates to the Evaluation Reports and verification will be made if deemed necessary.
- The organization has numerous US based professional engineers. A listing (non-comprehensive) is shown in the table below, with the appointed PE per discipline and asset.

		ASSET			
Discipline	**PEs**	**WTG**	**WTG Foundation**	**OSS**	**Cables**
Civil **Structural**	• **David Menzies** • Richard Daoud • Daniel Lee • Ryan Guerrero • Mohammad Heivand	• David Menzies	• David Menzies	• David Menzies	• David Menzies
Mechanical	• **Cristian Rosca** • Richard Henrikson • Josh Miller • Saman Halabian • Sam Sampat • Jeff Comparato	• Cristian Rosca	N/A	• Cristian Rosca	N/A
Electrical	• **Cristian Son** • Steven Hooper • Hussein Boudiab • Michael Hill • Joe Chao • Saman Parsi	• Cristian Son	N/A	• Cristian Son	• Cristian Son
Safety	• **Bikash Ghosh** • Doug Evans • Lisa Beaver	• Bikash Ghosh	N/A	• Bikash Ghosh	N/A

- The organization also has numerous local technical resources for the fabrication phase:

Technician	CWI	ASNT		NACE	
		Level II	Level III	Level II	Level III
Albert Carr	X		X		
Dale Cheek	X		X		
Jeff Ciezki	X	X			
Luis Cordero	X		X		
Matthew Dagget	X				
John Delk, CWI	X	X			
Jeffery Eckwright	X	X		X	
Kerry Hahn	X	X			
Don Heiter	X	X			X
Timothy Hinman	X	X		X	
Michael Hotaling	X	X			
Mark Irwin	X		X		
Jack Ivey	X	X			
Darrel Jones	X	X			
Scott Kennedy	X	X			
Thomas Koepl	X	X			
Duane Kothlow	X	X			
Timber Loveland	X	X			
Paul Mafla	X	X			
Chris Odom	X				
Kevin Prestude	X	X			
Brian Treveer	X	X			
Eric Thompson	X	X			
Jordan Wind	X	X			
Dean Urbanek	X	X			

- The following additional local technical resources holding SOMWS certification. These resources are for the transportation and installation phases.

Technician	SOMWS		
	Renewables	Project Cargo	Oil & Gas
Chris Bintcliffe	X	X	X
James Vavasour	X	X	X
Danny Biancato	X	X	X
Christopher Bowman		X	X
Miguel Hernandez		X	X
Duane Mendoza		X	X
Leonard Nguyen		X	X
Don Whelan		X	X

David Menzies		X	X
David Cisneros		X	X
Mauricio Saenz		X	X

- The following safety professionals will also be on the project:
  - Juan Marcano
  - Scott Sibillia
  - Henry Smahlik
  - Doug Alvey

PROJECT ORGANIZATION

An overview of the proposed project team is included in Appendix 4.1. Executive summaries of the team member's professional backgrounds are listed in Appendix 4.2.

BV's project organization is shown in the organograms in Appendix 4.1. BV's organizational structure follows the structure of the project phases (Design, fabrication and Installation) with a project organization for the Design phase and the Execution phases. In each of these phases there will be project teams for each of the four assets (WTG's, Foundations, OSS, and Submarine Cables); where possible the same team members are involved in more than one asset to ensure information transfer between the assets.

There is a single project manager for the entire project to ensure coordination; further the project manager is U.S. based and the primary contact to the authorities.

PROJECT MANAGEMENT

Main project management tasks during the execution of the scope of work shall include:

- Preparation and follow up on project management plans. Particularly, a communication plan will be worked out with the developer specifying communication lines between BV project team and the counterpart project team of Atlantic Shores Offshore Wind, LLC.
- Furthermore, BV will provide Atlantic Shores Offshore Wind, LLC with an overview of the design verification and surveyor teams and key contact information. This facilitates efficient contact between Atlantic Shores Offshore Wind, LLC's office-based and site teams and BV's office-based engineers and site surveyors.
- To set up of internal agreements with BV units.
- Facilitate lessons learned workshop with team members in connection with project kick-off, based on previous learnings. This can ideally be organized in corporation with the Developer such that interaction and team spirit is established at the beginning.
- Ensure transfer of knowledge across the interfaces between the design and execution phases. A physical meeting between PM and Coordinators of the Design Phase and the Execution phases (manufacturing and installation) including relevant project personnel will be held.

- Assist the Designer and Atlantic Shores Offshore Wind, LLC in decision making if the as-built documentation is found to deviate from the certified design.

MANAGEMENT SYSTEM

The BV management system is an integrated quality health, safety and environment, and business administration management system.

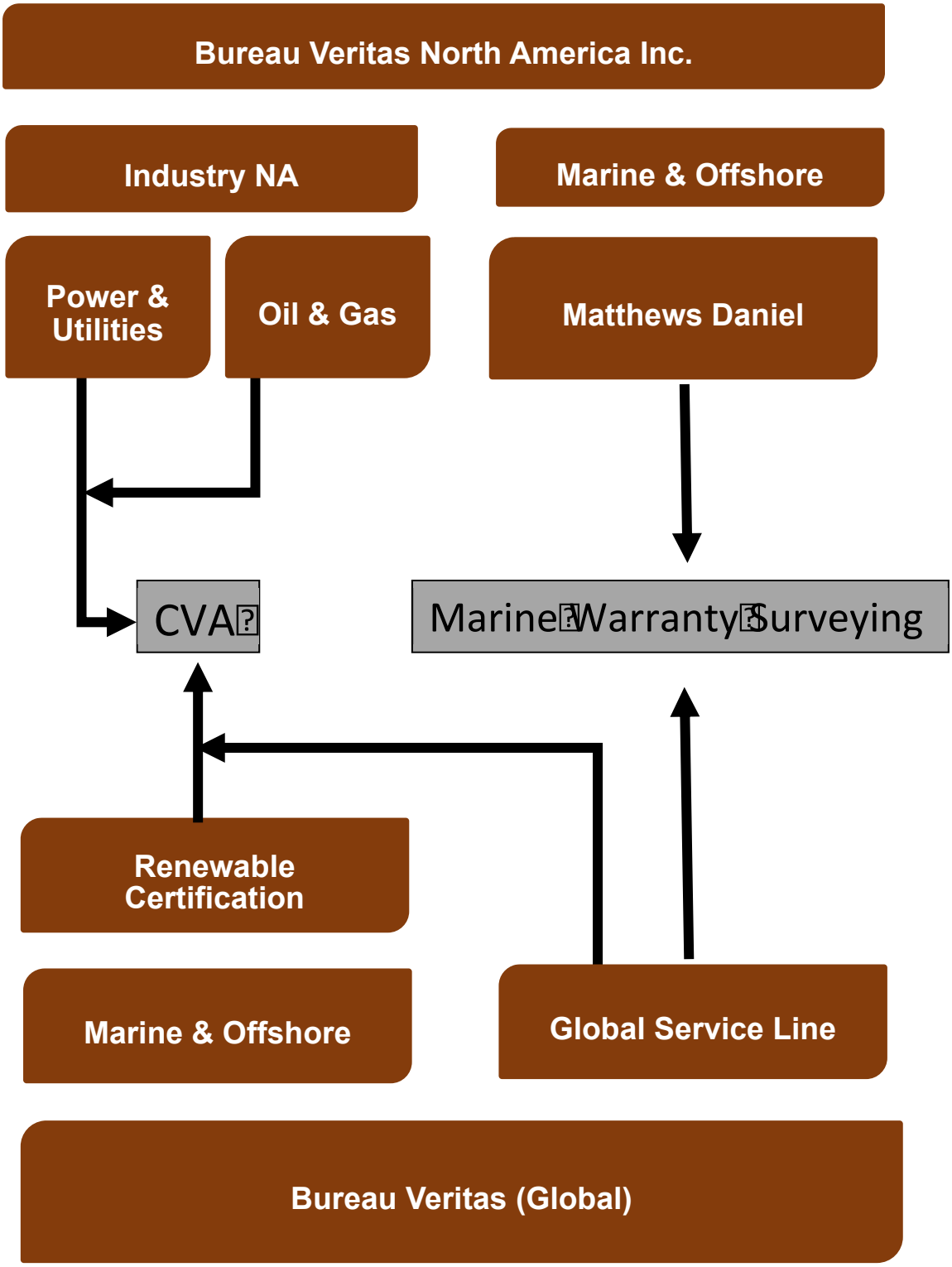
Bureau Veritas Certification France is accredited by COFRAC for certification of management systems according to ISO 17021. As a consequence, Bureau Veritas Certification France's quality management system cannot be certified, as stated by the accreditation: "A certification body shall not certify another certification body".

However, the requirements of the accreditation standard ISO 17065 for project certification are more stringent than the ISO 9001 requirements. The Bureau Veritas Certification France quality management system is therefore regularly audited by COFRAC. A description of BV's quality, health, safety and environment policy and management system is provided in Appendix 2.4.

APPENDICES:

Appendix 1:	BV's Structure, including its affiliates, relevant to the CVA work
Appendix 2:	Project Certification Qualifications
Appendix 2.1:	Accreditation Certificate according to ISO/IEC 17065
Appendix 2.2:	ISO 9001 Certificate
Appendix 2.3:	Certificate of Acceptance to participate in the IECRE - IEC System for Certification to Standards relating to Equipment for use In Renewable Energy Applications
Appendix 2.4:	BV's Corporate Quality, Environmental, Health and Safety Policy
Appendix 3.1:	Summarized Overview about Current Project Certification Activities
Appendix 4.1:	Proposed Project Team
Appendix 4.2:	Executive Summaries of Team Member's Professional Backgrounds
Appendix 5:	Information on BV's Renewables Division
Appendix 6:	PRT WT 001 - Qualification of evaluators for Certification of Wind Turbines, Wind Turbine Components and Wind Turbine Projects

Appendix 1: BV's Structure, including its affiliates, relevant to the CVA work



Appendix 2: Project Certification Qualifications

Appendix 2.1: Accreditation Certificate according to ISO/IEC 17065

Bureau Veritas Certification France is accredited according to ISO/IEC 17065 for type certification of wind turbines, component certification, prototype certification and project certification. The corresponding certificate is available on the IECRE – Renewable Energy site at the following address:
https://www.iecre.org/dyn/www/f?p=110:9:0::::P9_ORG_ID:26106

The accreditation is delivered on a flexible scope basis, meaning that Bureau Veritas Certification France is responsible for managing itself its list of standards under accreditation and is allowed to include additional activities in their scope of accreditation. The rationale behind is that competence has been evaluated by COFRAC not only to carry out activities in accordance with previously evaluated procedures, but also for the development and validation of their procedures in accordance with a pre-established system. The flexible scope accreditation principles and requirements are defined in EA 2-15 document which is available at the following address:
http://www.european-accreditation.org/publication/ea-2-15-m

The list of standards for which Bureau Veritas Certification France can deliver accredited certificates (among which IEC 61400-22 certification scheme) is available on the Bureau Veritas website at the following address:
https://www.bureauveritas.fr/accreditation

Appendix 2.2: ISO 9001 Certificate

CERTIFICATE

Management system as per
EN ISO 9001 : 2015

The Certification Body TÜV NORD CERT GmbH hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

Bureau Veritas
8, cours du Triangle
92800 Puteaux
France

with the locations according to the annex 2

operates a management system in accordance with the requirements of ISO 9001 : 2015 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Please see scope annex 1

Certificate Registration No. 44 100 160145
Audit Report No. 3500 0000

Valid from 2022-02-01
Valid until 2025-01-31
Initial certification 1996

Certification Body
at TÜV NORD CERT GmbH

Essen, 2022-01-25

Validity can be verified at https://www.tuev-nord.de/de/unternehmen/zertifizierung/zertifikatsdatenbank.

TÜV NORD CERT GmbH Am TÜV 1 45307 Essen www.tuev-nord-cert.com

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-01-00

Appendix 2.3: Certificate of Acceptance to participate in the IECRE - IEC System for Certification to Standards relating to Equipment for use In Renewable Energy Applications

Certificate of Acceptance

To participate
in the IECRE – IEC System for Certification to Standards relating to Equipment for use In Renewable Energy Applications

Bureau Veritas Certification France
Le Triangle de l'Arche, 9 Cours du
Triangle
92800 Puteaux
France

has been assessed and determined to fully comply with the requirements of ISO/IEC 17065: 2012, The Rules and Procedures of the IECRE System.

Bureau Veritas Certification France

is therefore entitled to operate as a French Certification Body within the IECRE the Scope and Standard(s) as listed in the relevant part of the IECRE Web Site at www.iecre.org, and is subject to all other terms as set forth in the IECRE Basic Rules and Rules of Procedure.

The IECRE membership status of this RECB can be verified on the aforementioned site.

Geneva, Switzerland, January 2022

Wolfram Zeitz
IECRE Executive Secretary

Appendix 2.4: BV's Corporate Environmental, Health and Safety Policy

Health, Safety & Environmental Statement

BUREAU VERITAS

Bureau Veritas' HSE vision is an accident free workplace, that causes no harm to people and that minimizes the environmental impacts of business activities.

Bureau Veritas is specialized in testing, inspection and certification services in the fields of quality, health & safety, environment and social responsibility. Present in 140 countries, with a strong acquisition policy, an increasing number of test laboratories and of sub-contractors, we face significant challenges to ensure a consistent level of HSE throughout the Group.

The following elements constitute the heart of our commitment to continuously enhance our HSE performance and to add value for our clients.

OUR PRINCIPLES

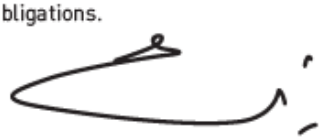
- Safety is an absolute;
- Health and Safety at work is our responsibility:
  - Line management demonstrates leadership and is accountable for compliance
  - Each employee, sub-contractor and visitor must comply and be alert

OUR MANAGEMENT SYSTEM

- Risks and opportunities are identified and managed especially where they have the potential to cause an accident, injury to people, or unacceptable impacts on the environment or the community
- Employees and sub-contractors are empowered to address unsafe or hazardous situations
- Sub-contractors are required to comply with this Statement

OUR COMMITMENTS

- Provide a safe workplace and systems of work to prevent accident and injury to people.
- Prevent pollution, minimize energies consumption and waste generation.
- Increase employees HSE awareness and safe behaviour;
- Comply with relevant HSE legislation, Group, clients and other applicable obligations.



Didier Michaud-Daniel - Chief Executive Officer
April 2017

Appendix 3.1: Summarized Overview about BV's Current Project Certification Activities

Client	Year	Client Country	Projects	Services
Moray West Offshore Windfarm	2021-Ongoing	United Kingdom	Moray Offshore Windfarm (West) Limited	• Project Certification including Site Conditions, Design Basis, Integrated Load Analysis and Design Evaluation • Certification of Offshore Substation including Design Basis and Design • Jacket substructures
US Wind	2021-Ongoing	USA	MarWin	• CVA per 30 CFR 285
EnBW	2021-Ongoing	Germany	Hedreiht Offshore Wind Farm	• Complete Project Certification according to IEC 61400-22 • Includes RNA, site-specific tower and WTG foundations
TenneT TSO B.V.	2020 - Ongoing	The Netherlands	Hollandse Kust Noord Offshore Wind Farm	• Certification of Offshore Substation including Design Basis and Design • Jacket substructures
TenneT TSO B.V.	2020 - Ongoing	The Netherlands	Hollandse Kust West Alpha Offshore Wind Farm	• Certification of Offshore Substation including Design Basis and Design • Jacket substructures
TenneT TSO B.V.	2021 - Ongoing	The Netherlands	Hollandse Kust West Beta Offshore Wind Farm	• Certification of Offshore Substation including Design Basis and Design • Jacket substructures
EDF Energies nouvelles	2016 – Ongoing	France	Fécamp, Courseulles and Saint-Nazaire OWF	• Complete Project Certification according to IEC 61400-22 • Includes RNA, site-specific tower and WTG foundations
Ørsted	2017-2021	The Netherlands	Borssele 1 & 2 OWF	Project certification according to IEC 61400-22 • Site Conditions Assessment • WTG Manufacturing surveillance • Transport and Installation surveillance • Commissioning surveillance • Final Evaluation and Project Certificate
MORAY East Offshore Windfarm	2017-2021	United Kingdom	Moray Offshore Windfarm (East) Limited	• Project Certification including Site Conditions, Design Basis, Integrated Load Analysis and Design Evaluation. • Certification of Offshore Substation including Design Basis and Design
Iberdrola	2016-2019	Spain	East Anglia One Offshore Wind Farm	• Certification of Offshore Substation including Design, Manufacturing, Installation and Commissioning • Jacket substructure
STX France	2016-2019	Belgium	Rentel Offshore Wind Farm	• Complete certification of Offshore Substation including Design, Manufacturing, Installation and Commissioning • Stress-skin topside and monopile substructure
Ørsted	2015-2018	Germany	Borkum Riffgrund 2 OWF	Project certification acc. BSH and IEC 61400-22 • Design Evaluation of Offshore Substation • Wind turbine manufacturing surveillance • Manufacturing surveillance of 20 Suction Bucket Jackets in Poland • Suction Bucket Jacket substructure Transport & Installation surveillance • Offshore Substation Commissioning surveillance • Final Evaluation and Project certificate

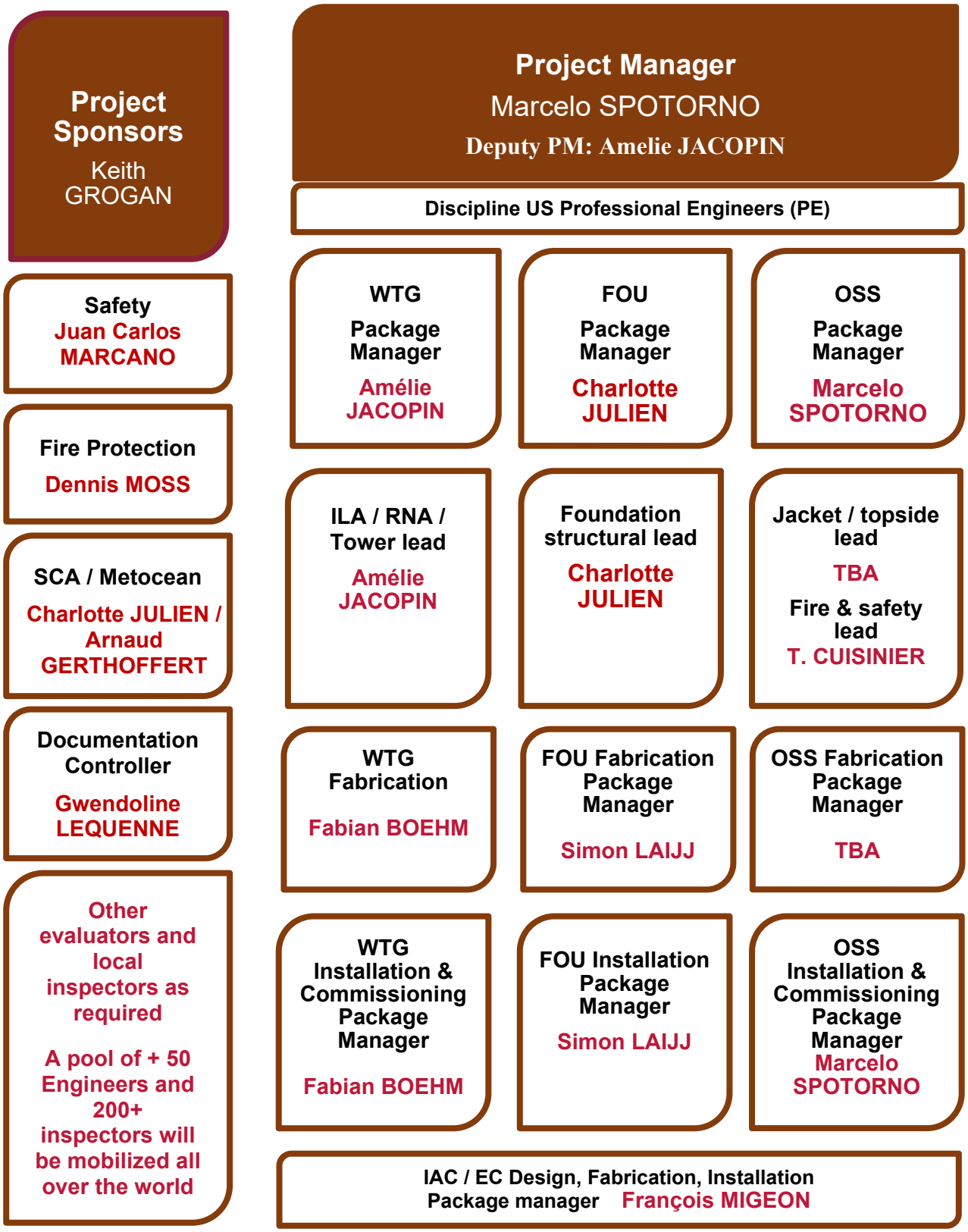
EDF Energies nouvelles	2017	France	Faraman Provence Grand Large	• Complete Project certification according to IEC 61400-22
E-On Climates Renewables	2013- 2016	UK	Rampion DWF WTG Vestas V112-3.45 MW	• Project Certification according to IEC 61400-22 • Evaluation of the modules Site assessment, Design Basis, Integrated Load Analysis, Design Evaluation • All structure & substructure including RNA, WTG tower, monopile foundations, ESP topside & jacket substructure
WindMW	2013-2014	Germany	Meerwind Südost OWF (WTGs & ESP)	• Offshore supervision of WTG erection • 24/7 QC • Commissioning control of WTGs

Experience with ILA with top Turbine Suppliers

Bureau Veritas has already had experience with most of the contractors of the wind industry:

- In collaboration with SGRE the following activities:
  - For Provence Grand Large offshore wind farm (floating wind turbine), BV has performed site conditions assessment, design basis evaluation, integrated load analysis and design evaluation. BV is currently performing WTG and tower manufacturing surveillance with SGRE for Provence Grand Large
  - For Borssele 01&02 offshore wind farms BV is currently carrying WTG and tower manufacturing surveillance.
  - For Fécamp offshore wind farm (gravity base structure) BV has performed Integrated load analysis and design evaluation.
  - For Courseulles offshore wind farm (monopile) Independent load Analysis is on-going.
- In collaboration with MHI Vestas the following activities:
  - For Moray offshore wind farm (jacket) BVC has performed Design basis Integrated load analysis and Design of the foundation and tower.
  - For Borkum Riffgrund II, BVC has performed manufacturing surveillance of the Wind Turbine.
  - For the Rampion (monopile), BVC was in charge of the project and performed design basis evaluation and Integrated load Analysis.
- In collaboration with GE the following activities:
  - For Fécamp and Saint Nazaire offshore wind farm (gravity base structure), BV has performed Integrated load analysis and design evaluation. SGRE has taken over GE.
  - For Courseulles offshore wind farm (monopile) BV has performed integrated load analysis.

Appendix 4.1: Proposed Project Team



Appendix 4.2: Executive Summaries of Team Member's Professional Backgrounds

Role Description:

Project Sponsor

A designated company executive with overall responsibility for the project on behalf of Bureau Veritas management.

Project Manager

The Project Manager is the main interface point with the Client. The PM is responsible for all aspects of delivery, ensuring that the project delivers the right outputs, to the required level of quality and within the constraints of time, cost, resources and risk. The Project Manager is responsible for day-to-day management of all aspects of project delivery.

Professional Engineers (PE)

US based engineers, licensed from their state's licensure board, that will conduct or direct supervise the verification performed.

Package Manager

The Package Manager is the main interface point with the Project manager. He is responsible for all aspects of delivery, ensuring that the package delivers the right outputs, to the required level of quality and within the constraints of time, cost, resources and risk. The Package manager is responsible for day-to-day management of all aspects of package delivery. He is a senior expert in the field of the package.

Technical Support

The Technical support is a technical expert with strong experience in a similar project scope. He supports the project to ensure smooth and efficient delivery.

Experienced Key People

Bureau Veritas understands that offshore wind projects are complex and time pressured.

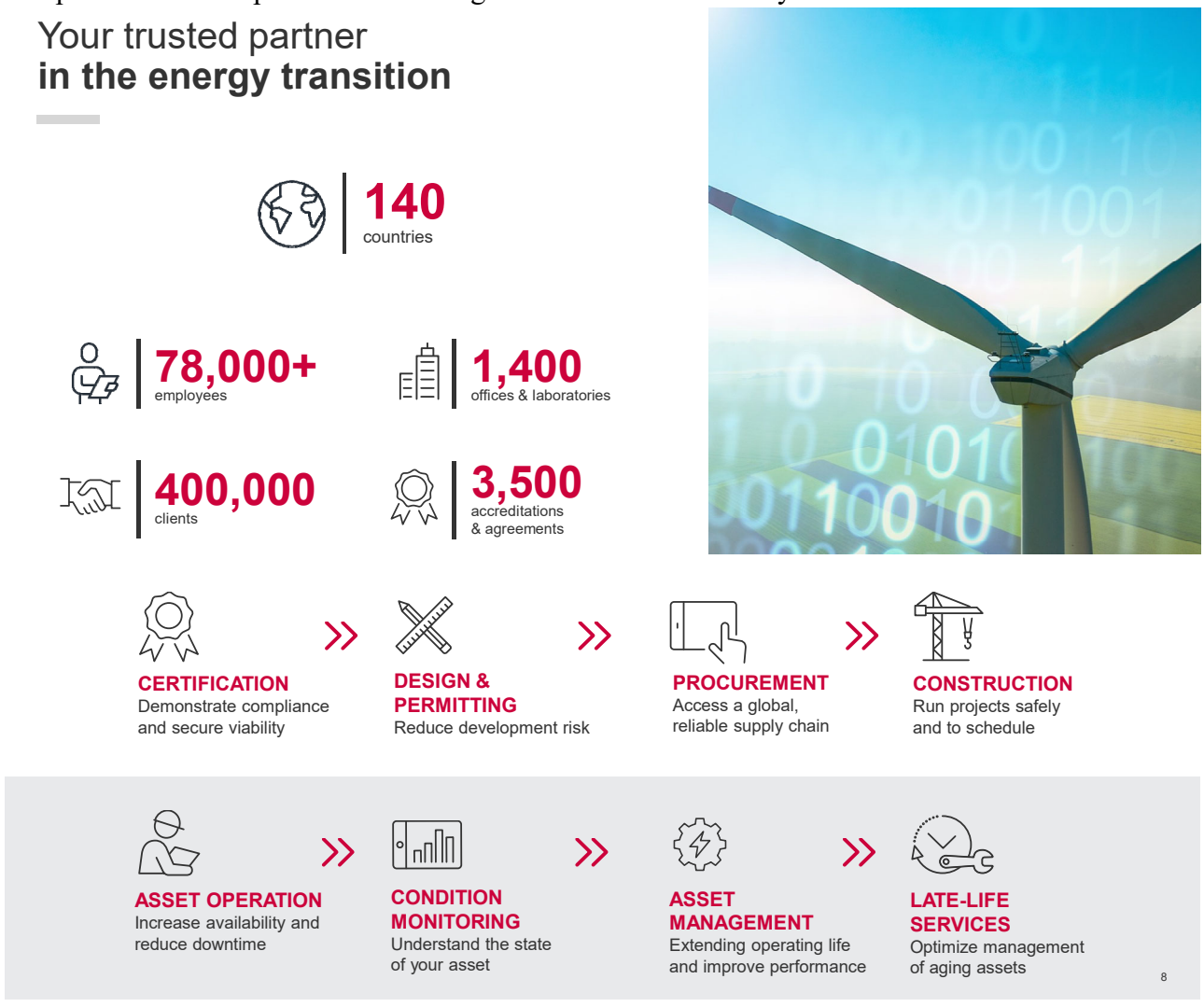
For this reason, the "key people" are offshore wind experienced and are in charge of ensuring that each inspector/engineer is properly briefed internally at the start of any assignment so that all the Atlantic Shores expectations are met.

Personnel	Project Role	Responsibilities/Key Experience
Key personnel from the organigram		
Keith Grogan	Project Sponsor	Vice President Industrial Inspection Division, Overall responsibility for the project on behalf of Bureau Veritas management.
Marcelo Spotorno	Project Manager/ OSS Package Manager	Marcelo has more than 30 years of experience in offshore Oil & Gas and marine projects. He has been involved in a variety of roles including: design, engineering, construction, commissioning, technology development, surveying in operation, independent verification, as well as project and general management. He has over 25 years of experience working in classification / certification with extensive knowledge of regulatory regimes and international standards.
Amélie Jacopin	Deputy Project Manager/WTG Package Manager	Amélie is currently project manager for the certification of offshore wind farms, from design to transport, installation and commissioning. She is also working on loads and structural review. Amélie was previously working as loads engineer for a wind turbine supplier, and as structural engineer in the Oil&Gas subsea industry.
Arnaud Gerthoffert	SCA / FOU Package Manager	Arnaud has accumulated 10 years' experience in the offshore sector, with focus on geotechnics, offshore structures and hydrodynamics. He has acquired a deep experience on a wide range of soil conditions and foundation types, be it anchors, suction buckets, monopiles or jack-ups. Regarding offshore wind specific experience, he has been involved in the certification of the Rampion Offshore Wind Farm for E.ON.
François Migeon	ACP Package Manager & ACP lead evaluator	François has been involved in the design review and certification of Umbilicals, Power Cables and SURF projects for 20 years. He has a significant experience in design appraisal, independent calculations and manufacturer's qualification, both for static and dynamic cables all over the world.
Thierry Cuisinier	Fire & safety lead evaluator	Thierry has a deep experience on Fire & Safety systems for offshore units, both in the O&G business and in the wind industry. He was involved in the certification of the Fire & Safety aspects for various offshore substations such as Rampion, Borkum Riffgrund 2, Rentel and East Anglia ONE.

Personnel	Project Role	Responsibilities/Key Experience
Charlotte Julien	Metocean (wind)	Charlotte was previously working for the Bureau Veritas Offshore department as hydrodynamic and structural engineer. She is currently working as structural engineer and load engineer in the Bureau Veritas Wind team.
Marine Langeoire Casalta	Metocean (marine)	Marine is currently working on Metocean verification for the offshore wind farm projects.
Juan Carlos Marcano	Safety	Juan Carlos is the Field HSE Director at Bureau Veritas North America
Dennis Moss	Fire Protection	Dennis is the Fire & Safety lead at Bureau Veritas North America, Facilities Division
Simon Laaij	FOU Fabrication, Installation Package Manager	Inspector of welded constructions Level III, BOSIET certified, expert in Transport and installation phase. He is currently involved the HKW-1 HKW-B Tennet offshore substation platform and for the French offshore projects.
Fabian Böhm	WTG Fabrication, Installation & Commissioning Package Manager	Fabian is an offshore-qualified specialist, working on surveillance of manufacturing, transportation, installation, commissioning and operation of offshore wind farms. He was in particular involved in Meerwind Süd/Ost and Nordsee Ost, in addition to the Orsted wind farms Borkum Riffgrund 1 and 2 and Gode Wind.

Appendix 5: Information on BV's Power & Utilities Division

Bureau Veritas has been in the power industry for over 100 years. We are a business to business to society organization. Focused on quality, health and safety, environmental protection and social responsibility. Testing inspection, certification and technical services are the cornerstone of our services. As business transition into the renewable industry we are there to provide impartial independent expertise throughout the lifecycle of an asset.



GENERATION

Low carbon

- Offshore & onshore wind
- PV & CSP solar
- Storage
- Nuclear
- Hydro
- Conventional thermal

TRANSMISSION

Power grids

- UHV DC power lines
- HV power lines
- HV sub stations
- Interconnectors

DISTRIBUTION

Utilities

- MV/LV overhead and underground lines
- MV/LV sub stations
- Gas & water distribution
- District heating & cooling

Track record
Our customers

CERTIFICATION

Demonstrate compliance & secure viability

- Approvals in Principle
- Prototype certification
- Component certification
- Type certification
- Project certification

DESIGN & PERMITTING

Reduce development risk

- Wind measurement & site assessment
- Marine Warranty Services
- Grid connection assessment
- Design review
- Environmental impact assessment
- Permitting support
- Risk assessment
- Due diligence
- Investor / lender services

PROCUREMENT

Access a global, reliable supply chain

- Supply chain technical assessment
- Technical procurement support
- Shop inspections (QA/QC)
- Expediting
- Factory acceptance tests
- Transport, loading & unloading supervision

CONSTRUCTION

Run projects safely & to schedule

- Project & construction management support
- On site QA/QC
- On site HSE
- Turbine foundation supervision
- Commissioning and test run supervision
- Take over and end-of-warranty inspections

ASSET OPERATION

Ensure availability & shorten outage time

- Periodic inspections of blades & main components
- Non-destructive testing
- Load measurements
- Vibration monitoring
- Thermographic inspections
- Oil analysis
- Endoscopic inspections
- Rotor balance inspections
- Earth termination measurements
- Training
- Failure & damage analysis

ASSET MANAGEMENT

Extend operating life & increase performance

- O&M management
- Maintenance strategies
- Condition monitoring & assessment
- Asset integrity management
- Reliability engineering
- Performance optimization
- Turbine digital twin
- Remaining life assessment & lifetime extension

Appendix 6: PRT WT 001 - Qualification of evaluators for Certification of Wind Turbines, Wind Turbine Components and Wind Turbine Projects

PRT WT 001

Qualification of evaluators for Certification of Wind Turbines, Wind Turbine Components and Wind Turbine Projects

ⓘ Information on previous revisions

Revisions	Modifications
00	Document creation
01	Addition of appendix and modification concerning description of evaluator application
02	Modification of equivalent career and addition of qualification Personnel Safety
03	Precisions relative to the qualification “Personnel Safety” following COFRAC audit of 25/07/11
04	Document simplified and reorganized according to the new template. Replacement of Qualifonline par « Qualification management tool ». Extension to GL guideline, conformity to ISO/IEC 17065 and procedure simplification Extension to Project certification of wind turbine projects
05	Precisions relative to component inspections. Inclusion of evaluation leader. Adjustment of Global wind turbine inspection. Minor adjustments.
06	Clarifications added for mandatory information meetings
07	Association with appendices A and B Renewal requirements : removal “mandatory training” Modification of responsibilities for approval and suspension Modification of validity to 5 years
08	Extension to certification of floating wind turbines **Deletion of qualification 870-17** (equivalent to both 870-16 and 870-18) **Addition of qualifications 870-20 Offshore cables and 870-21 Floating structures** Adjustment of first validation
09	Update of Appendix A
10	Updating of the name of the qualification 870-14 Clarification of the approver’s name Modification of the 870-15 qualifying requirements Addition of the term “Technical Area”
11	Addition of new qualification codes (870-30 for evaluation review ; 822-22 to 870-25 for new inspectors qualifications) Strengthening of qualification requirements Modules correspondence between the different certifications schemes transferred at the end of the document Clarification on training, mentoring and periodical technical exchanges Numbering of sections and restructuring Addition of a transition period Merging of Appendix A & B

1 Object and application scope

This procedure describes the conditions for the qualification of evaluators for Certification of Wind Turbines, Wind Turbine Components and Wind Turbine Projects.

This procedure fulfils the general requirements relative to product certification bodies mentioned in the standard NF EN ISO/IEC 17065.

This procedure is associated with appendix A, which must be used for every initial request and request of renewal.

2 Definitions

This qualification procedure uses abbreviations that are defined hereafter:

- STO3[1]: Offshore structures, metallic structures, pipelines following PRT SI 010 “Qualification des intervenants – Vérification de la conception”
- ECP3[2]: Electricity, instrumentation, regulation, automatisms and control-process, including Process Safety System following PRT SI 010 “Qualification des intervenants – Vérification de la conception”
- LEM3[3]: Lifting and handling devices, mechanical machines and equipment PRT SI 010 “Qualification des intervenants – Vérification de la conception”
- GC-FE[4]: Technical control of wind turbine foundations - Following PRT CC 018 « Contrôle technique des fondations des éoliennes terrestres – Qualification des intervenants »
- Shop Inspection[5] in the concerned field (Materials, Components, Pressure Equipment ; Machinery and Mechanical Equipment ; Electrical Equipment) following Resource Procedure A41/A42/A31“Shop Inspection, Expediting, Supplier Technical Assessment - Qualification & Management of Competences”
- MD3[6] following PRT MD 001 “Machines – Processus de qualification des intervenants”

3 Transition period

A transition period of three months (from 01/08/2021 to 31/10/2021) is put in place. During this transition period, any inspector already qualified under 870-15 qualification will be authorised to perform inspections requiring 870-22 to 870-25 qualifications as per this new version of the qualification procedure.

4 Initial Qualification

4.1 Training

- **Training for "Review" qualifications**

For "review" qualifications, i.e. for evaluators involved in the SCA, Design Basis, ILA, and Design Evaluation modules, as well as Evaluation leader and Evaluation reviewer, this theoretical training consists in a # 2 hours "Wind Certification scheme" training focusing on:

- Wind certification scheme (IEC 61400-22 and IECRE) operating under ISO/IEC 17065 rules

- **Training for "Inspection" qualifications**

For "inspector" qualifications, for inspectors involved in manufacturing or site surveillance modules, this theoretical training covers:

- Basic knowledge on wind scheme

Followed by dedicated training for the relevant component categories required for the inspection category:

- Wind Structures Components (Castings & Forgings)
- Wind Mechanical Rotatory Machines
- Wind Structures (Composites)
- Wind Electrical Components (Converter, Generator, Transformer)

4.2 Mentoring

Mentoring is required for all qualifications defined in this document.

- **Mentoring for "Review" qualifications**

For "review" qualifications, i.e. for evaluators involved in the SCA, Design Basis, ILA, and Design Evaluation modules as well as Evaluation leader and Evaluation reviewer, this mentoring consists in:

- Part 1 : A global explanation and exchanges on wind turbines and wind project design technical issues (by the certification manager, or any person qualified as evaluation leader or by a Wind technical expert from the Bureau Veritas GSL)
- Part 2 : A dedicated explanation on the relevant certification modules (by a mentor having the qualification for which the mentored person is applying)

- **Extended Mentoring Program for "Review" qualifications**

If any personnel to be qualified for "review" qualification has not yet accumulated sufficient general experience, a mentoring program needs to be additionally completed successfully, during a period corresponding to the required accumulated experience in the related technical field.

A mentoring template shall be filled all along the mentoring period.

- **Mentoring for "Inspection" qualifications**

For "inspections" qualifications, i.e. for inspectors involved in manufacturing or site surveillance modules, this mentoring consists in:

- a specific presentation to BV relevant procedures, templates, tools and the expected deliverables
- completed with key technical issues to be covered during an inspection
- by a mentor either qualified as evaluation leader, or an inspector having the qualification for which the mentored person is applying, or by a Wind technical expert from the Bureau Veritas GSL,

- **Extended Mentoring Program for "Inspection" qualifications**

If any personnel to be qualified for "inspections" qualification has not yet accumulated sufficient general experience (refer to column "general inspection qualification requirements" in table "inspection qualification"), the below mentoring program needs to be additionally completed successfully. This additional mentoring program, is defined as described below.

- First inspection with mentee shadowing by a qualified inspector (mentor)
- Second inspection carried out by mentee under supervision of mentor
- Third inspection carried out by mentee with general guidance by a qualified inspector

5 Qualification maintenance

5.1 Periodical technical exchanges

In order to maintain the competencies of the evaluators, the following periodical technical exchanges are organised:

- One annual "Wind technical day" meeting for "review" evaluators, covering:
  - Latest return of experience from successful certification contracts
  - Difficulties encountered
  - Update on technology and best practices
- One annual remote technical meeting for inspectors for each of the following families of equipment:
  - Wind Structures Components (Castings & Forgings)
  - Wind Mechanical Rotatory Machines
  - Wind Structures (Composites)
  - Wind Electrical Components (Converter, Generator, Transformer)
- Technical alerts on an as required basis for all inspectors qualified, covering in particular information on critical technology developments that require adaptation of inspection scope, detail or level

Participation to the annual meeting is mandatory to maintain the qualification (for both reviewers and inspectors), and participation is recorded under Q&S. In case of unavailability of an evaluator for an annual meeting, proof of in-depth reading and understanding of the meeting support (i.e. through Sharepoint) shall be recorded.

5.2 Suspension of qualification

A qualification can be suspended or cancelled anytime, by the Wind Certification Manager, if the performances of the qualified collaborator are found to be unsatisfactory following:

- a client's claim;
- an internal audit or a supervision report.
- an evaluation review
- an absence of participation in the annual technical meeting (without proof of reading the corresponding support)

The request for suspension or cancellation is addressed to Wind Certification Manager for suspension or cancellation of the qualification.

6 Qualification codes requirements by certification modules

6.1 For Type & component Certification modules

The qualifications listed below are required for everybody implied on services of Type Certification and Component certification of the following systems and sub-systems. For schemes other than IEC, please refer to correspondence table at the end of this document.

Modules from IECRE and IEC 61400-22	Qualification required	Code
Control and protection system Component tests	Review/ Control and safety systems	870-3
Loads and load cases	Review/ Loads	870-6
Blades Component tests	Review/ Blades	870-7
Machine and RNA structural components Component tests	Review/ Machines Review/ Integrated lifting devices	870-1 870-4
Machine and structural components Housing Component tests	Review/ Structures	870-8
Electrical systems Component tests	Review/ Electrical system	870-2
Design control Manufacturing, transportation, installation, maintenance, personnel safety	Review/ Processes Specific personnel safety	870-9 870-19
Foundation design requirement Foundation design	Review/ Foundation	870-5
Onshore tower design	Review/ Structure	870-8
Offshore tower design	Review/ Offshore structure	870-13
Quality system evaluation	Review/ Processes	870-9
Manufacturing inspections	Inspections/ Components	870-15 / 870-22 / 870-23 / 870-24 / 870-25 (as per detail in §12)
Offshore Transport and Installation surveillance	Inspections / Offshore activities	870-18
Safety and function tests	Review/ Control and safety systems	870-3
Power performance measurements	Review/ Wind assessment	870-10
Load measurements	Review/ Loads	870-6
Blade tests	Review/ Blades	870-7
Power quality tests Low voltage ride through test	Review/ Electrical system	870-2
Acoustic noise measurements	Review/ Wind assessment	870-10
Workshop test and prototype test of gearboxes	Review/ Machines	870-1
Prototype testing	Inspections/ Wind turbine	870-16
Final Evaluation	Evaluation leader	870-0

6.2 For Project Certification modules

The qualifications listed below are required for everybody implied on services of Project certification of the following systems and sub-systems. For schemes other than IEC, please refer to correspondence table at the end of this document.

Modules from IECRE & IEC 61400-22	Qualification required	Code
Site Conditions Assessment	Review/ Wind assessment Review/ Marine conditions Review/ Soil conditions	870-10 870-11 870-12
Design Basis Evaluation	Same as for Type Certification Review / Offshore structures Review / Floating structures Review/ Corrosion protection	 870-13 870-21 870-14
Integrated Load Analysis	Review/ Loads	870-6
Site-specific wind turbine/ RNA design evaluation	Same as for Type Certification Review/ Corrosion protection	 870-14
Site-specific support structure design evaluation	Review / Offshore structures Review / Floating structures Review / Corrosion protection	870-13 870-21 870-14
Other installations design evaluation	Review / Offshore structures Review/ Electrical system Review/ Corrosion protection Review/ Offshore cables	870-13 870-2 870-14 870-20
Wind turbine/ RNA manufacturing surveillance	Same as for Type Certification	870-15 / 870-22 / 870-23 / 870-24 / 870-25 (as per detail in §12)
Support structure manufacturing surveillance	Inspection/ Components	870-22
Other installations manufacturing surveillance	Inspection/ Components	870-15
Offshore Transport and Installation Surveillance	Inspection/ Offshore activities	870-18
Commissioning Surveillance	Inspection/ Global wind turbine Inspection/ Offshore activities	870-16 870-18
Project characteristics measurement	Review/ Electrical system Review/ Wind assessment	870-2 870-10
Operation and Maintenance Surveillance	Inspection/ Global wind turbine Inspection/ Offshore activities	870-16 870-18
Final Evaluation	Evaluation leader	870-0

7 Requirements by qualification code

7.1 "Design review" Qualifications

		Application scope		Qualification and renewal			
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Common requirements**	**Qualifying requirements**	**Renewal requirements**	**Request validated by:**
Overall Process	**870-0**	**Evaluation leader**	▪ Evaluates, regarding global coherence, the structural and functional aspects of the project, the interfaces between these aspects in one hand, and the interfaces between the project and its environment in the other hand ▪ Coordinates technical issues between client and evaluators ▪ Verifies evaluation reports ▪ Is responsible for the final evaluation report	▪ Has attended the training (§4.1) and performed the mentoring (§4.2) on Wind Certification ▪ Has 5 years of professional experience ▪	▪ has a Master degree ▪ has 8 years of professional experience including 3 years of in the wind field **OR** has 5 years of professional experience in the wind field ▪ For floating offshore wind farms, the requirement on experience in the wind field can be replaced by experience in the offshore industry, with the same duration ▪ thorough knowledge of: o ISO/IEC 17065 requirements for product certification bodies o the applicable certification scheme o the technical requirements for the applicable certification scheme ▪ is qualified as Review under Bureau Veritas procedure PRT WT 001	**5 years validity** Participation in: ▪ 2 projects ▪ Periodical technical exchanges (§5.1)	▪ 1st approver : Agency Director ▪ 2nd approver : Wind Certification Manager
Overall Process	**870-30**	**Evaluation reviewer**	▪ ensure the evaluation reviews (in redundancy with the certification manager)		▪ has a Bachelor degree ▪ has 8 years of professional experience, including 3 years in the wind or 5 years in the P&U field ▪ or has 5 years of professional experience in the wind field ▪ thorough knowledge of o ISO/IEC 17065 requirements for product certification bodies o COFRAC accreditation requirements o principles of conformity assessment applicable to industrial products o procedures and methodologies of Bureau Veritas Certification for conformity assessment of industrial products		
Mechanical / Loads	**870-1**	**Review/** Machines	▪ Evaluate, from documentation or with the help of second-hand-calculations, the design processes developed by the projects' actors ▪ Evaluate the technical documentation relative to design: plans, notes, safety		▪ has 2 years of experience in machines		
Electrical	**870-2**	**Review/** Electrical system			▪ is qualified ECP3[2] or has equivalent knowledge		

		Application scope		Qualification and renewal			
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Common requirements**	**Qualifying requirements**	**Renewal requirements**	**Request validated by:**
(HV & LV)			studies, calculation notes, measurements, test reports when applicable to the different concerned sub-systems ▪ Performs audit of the design processes developed by projects' actors ▪ Evaluate the manufacturing procedures and the testing programs as well as their result		▪ has 2 years of experience in electrical system		
Electrical (HV & LV)	**870-3**	**Review**/ Control and safety systems			▪ is qualified ECP3[2] or has equivalent knowledge ▪ has 2 years of experience in control and safety system		
Structures	**870-4**	**Review**/ Integrated lifting device			▪ is qualified LEM3[3] or has equivalent knowledge ▪ has 2 years of experience in integrated lifting devices		
Structures	**870-5**	**Review**/ Foundation			▪ has validated the internal training GC-FE[4] or has equivalent knowledge ▪ has 2 years of experience in foundation		
Mechanical / Loads	**870-6**	**Review**/ Loads			▪ has 2 years of experience in loads ▪ has validated a training on an aero-hydro-elastic software		
Structures	**870-7**	**Review**/ Blades			▪ has 2 years of experience in blade design		
Structures	**870-8**	**Review/** Structures			▪ has 2 years of experience in structures		
Overall Process	**870-9**	**Review/** Processes			▪ has 2 years of experience in processes (design control; quality management and manuals)		
Site Conditions	**870-10**	**Review/** Wind assessment			▪ has 2 years of experience in wind assessment		
Site Conditions	**870-11**	**Review/** Marine conditions			▪ has 2 years of experience in metocean conditions		
Site Conditions	**870-12**	**Review/** Soil conditions			▪ has 2 years of experience in offshore soil conditions		
Offshore Structures & Materials	**870-13**	**Review/** Offshore structures			▪ has 2 years of experience in offshore structures		
Offshore Structures	**870-14**	**Review/** Corrosion protection - materials			▪ has 2 years of experience in corrosion protection		

		Application scope		Qualification and renewal			
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Common requirements**	**Qualifying requirements**	**Renewal requirements**	**Request validated by:**
& Materials							
Offshore Structures & Materials	**870-20**	**Review/** Offshore cables			▪ has 2 years of experience in offshore cables		
Offshore Structures & Materials	**870-21**	**Review/** Floating structures			▪ has 2 years of experience in floating structures		

7.2 Inspection Qualifications

		Application scope		Qualification and renewal				
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Training Program**	**Pre-requisites & Mentoring**	**General inspection qualification requirements**	**Renewal requirements**	**Request validated by:**
Manufac-turing	**870-15**	**Inspection/** Other Components	▪ evaluates, from documentation, the manufacturing and realisation, at manufacturers, onsite, at project management or at contracting owner for a specific component (other than those covered by qualification 870-22 to 870-25) ▪ performs audits and inspections of manufacturing and realisation at manufacturers or onsite ▪ witnesses testing and evaluates the respect of the programs	Refer to the training program described in the §4.1 on training for "inspection" qualifications	Has completed the mentoring program described in the §4.2 AND has 2 years of experience in related components	▪ is qualified in Shop Inspection (SHI-MAT-COMP-PE or SHI-MECH-MACH or SHI-ELEC-EQUIP or SHI-COORD or SHI-EXPED) OR ▪ is qualified as a surveyor under the Bureau Veritas M&O procedure PNC 006) OR ▪ has proven and continuous track record for related inspections in recent 5 years OR ▪ successfully completed extended mentoring program for inspector	**5 years validity** Participation in: ▪ 2 projects ▪ Periodical technical exchanges (§5.1)	▪ 1st approver : Agency Director ▪ 2nd approver : Certification Manager

		Application scope		Qualification and renewal				
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Training Program**	**Pre-requisites & Mentoring**	**General inspection qualification requirements**	**Renewal requirements**	**Request validated by:**
Manufac-turing	**870-22**	**Inspection/** Wind Structures Components (Welding, Casting & Forging)	▪ evaluates, from documentation, the manufacturing and realisation, at manufacturers, onsite, at project management or at contracting owner for a specific wind structure component (tower, rotor shaft, housings, frame, substructure, foundation) ▪ performs audits and inspections of manufacturing and realisation at manufacturers or onsite ▪ witnesses testing and evaluates the respect of the programs		Has completed the mentoring program described in §4.2 AND has 2 years of experience in related components, or 5 years in related manufacturing process	▪ is qualified in Shop Inspection (SHI-MAT-COMP-PE or SHI-MECH-MACH) OR ▪ is qualified as a surveyor under the Bureau Veritas M&O procedure PNC 006) OR ▪ has proven and continuous track record for related inspections in recent 5 years OR ▪ successfully completed extended mentoring program for inspector		
Manufac-turing	**870-23**	**Inspection/** Wind Mechanical Rotatory Machines **Moderate Complexity components**: Rotor lock and mechanical brake **High Complexity components**: Bearings, Gearbox	▪ evaluates, from documentation, the manufacturing and realisation, at manufacturers, onsite, at project management or at contracting owner for a specific wind mechanical rotatory machines ▪ performs audits and inspections of manufacturing and realisation at manufacturers or onsite ▪ witnesses testing and evaluates the respect of the programs			▪ is qualified in Shop Inspection (SHI-MECH-MACH) OR ▪ is qualified as a surveyor under the Bureau Veritas M&O procedure PNC 006) OR ▪ has proven and continuous track record for related inspections in recent 5 years OR ▪ successfully completed extended mentoring program for inspector		
Manufac-turing	**870-24**	**Inspection/** Wind Structures (Composites) **Moderate Complexity components**: Nacelle & Spin cover **High Complexity components**: Rotor blades	▪ evaluates, from documentation, the manufacturing and realisation, at manufacturers, onsite, at project management or at contracting owner for a specific wind structure (composites) ▪ performs audits and inspections of manufacturing and realisation at manufacturers or onsite ▪ witnesses testing and evaluates the respect of the programs			▪ is qualified in Shop Inspection (SHI-MAT-COMP-PE) OR ▪ is qualified as a surveyor under the Bureau Veritas M&O procedure PNC 006) OR ▪ has proven and continuous track record for related inspections in recent 5 years OR ▪ successfully completed extended mentoring program for inspector		

		Application scope			Qualification and renewal			
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Training Program**	**Pre-requisites & Mentoring**	**General inspection qualification requirements**	**Renewal requirements**	**Request validated by:**
Manufac-turing	**870-25**	**Inspection/** Wind Electrical Components	▪ evaluates, from documentation, the manufacturing and realisation, at manufacturers, onsite, at project management or at contracting owner for a specific wind electrical component (converter, generator, transformer, etc.) ▪ performs audits and inspections of manufacturing and realisation at manufacturers or onsite ▪ witnesses testing and evaluates the respect of the programs			▪ is qualified in Shop Inspection (SHI-ELEC-EQEQUIP) OR ▪ is qualified as a surveyor under the Bureau Veritas M&O procedure PNC 006) OR ▪ has proven and continuous track record for related inspections in recent 5 years OR ▪ successfully completed extended mentoring program for inspector		
Manufac-turing	**870-16**	**Inspection/** Global wind turbine	▪ verifies by inspection that critical personnel safety features have been satisfactorily implemented in the installed wind turbine to be tested ▪ witnesses the commissioning and evaluates conformity with procedures and manuals		▪ has 2 years of professional offshore experience	▪ has attended the 5 theoretical online training for inspectors as indicated in the mentoring program (§4.2) ▪ is qualified to work at height ▪ is qualified MD3[6] or has equivalent knowledge		
Manufac-turing	**870-18**	**Inspection/** Offshore activities	▪ evaluates, from documentation, the transportation and installation procedures ▪ performs audits and inspections of the transportation and installation at manufacturers or onsite		▪ has 2 years of professional offshore experience	▪ is qualified to work offshore AND ▪ (is qualified in Shop Inspection (SHI-MAT-COMP-PE) or (SHI-MECH-MACH) OR ▪ has proven and continuous track record for related inspections in recent 5 years)		

		Application scope		Qualification and renewal				
Technical Area	**Code**	**Qualification**	**Mission/ scope**	**Training Program**	**Pre-requisites & Mentoring**	**General inspection qualification requirements**	**Renewal requirements**	**Request validated by:**
Safety	**870-19**	**Specific personnel safety**	▪ evaluates from documentation, during design, construction and operation phases, the aspects related to personnel safety considering integration of the safety requirement from the place where the wind turbine will be installed ➔ It has to be noticed that the integration of the safety requirement from each country in the certification referential is to be defined by a common agreement with Bureau Veritas Certification and the client		▪ has 2 years of experience in personnel safety	▪ is qualified MD3[6] or has equivalent knowledge ▪ Has necessary skills recognised on application file in order to evaluate the personnel safety in the installation country of the wind turbine		

8 Modules correspondence between the different certification schemes

8.1 Type & component certification

Modules from IECRE and IEC 61400-22	Modules from GL Guideline for the certification of wind turbines
Control and protection system Component tests	Safety system, protective and monitoring devices
Loads and load cases	Load assumptions
Blades Component tests	Strength analyses Structures
Machine and structural components Component tests	Machinery components Strength analyses
Machine and structural components Housing Component tests	Structures Strength analyses
Electrical systems Component tests	Electrical installations
Design control Manufacturing, transportation, installation, maintenance, personnel safety	Requirements for manufacturers, quality management, materials and production Manuals Periodic monitoring
Foundation design requirement Foundation design	Foundation Strength analyses of concrete
Quality system evaluation	Implementation of design-related requirements in production and erection Quality management system
Manufacturing inspections	Implementation of design-related requirements in production and erection
Safety and function tests	Test of turbine behaviour
Power performance measurements	Power curve
Load measurements	Load measurements
Blade tests	Rotor blades Strength analyses of fibre reinforced plastics
Power quality tests Low voltage ride through test	Electrical characteristics
Acoustic noise measurements	Noise emission
Workshop test and prototype test of gearboxes	Prototype tests of gearboxes
Prototype testing	Witnessing of the commissioning
Final Evaluation	Final Assessment

8.2 Project certification

Modules from IECRE & IEC 61400-22	DNV-GL-SE-0073 Phases	BSH Phases	Modules from GL Guideline for the certification of wind turbines
Site Conditions Assessment	I	Development	Assessment of Design Basis
Design Basis Evaluation Part A			
Design Basis Evaluation Part B		Design	
Design Basis Evaluation Part C			
Integrated Load Analysis	II		Site-specific Design Assessment
Site-specific wind turbine/ RNA design evaluation			
Site-specific support structure design evaluation			
Other installations design evaluation			
Wind turbine/ RNA manufacturing surveillance	III	Implementation Production	Surveillance during production
Support structure manufacturing surveillance			
Other installations manufacturing surveillance			
Transport and Installation Surveillance	IV	Implementation transport, installation	Surveillance during transportation and installation
Commissioning Surveillance	V	Implementation commissioning	Surveillance during commissioning
Project characteristics measurement			NA
Operation and Maintenance Surveillance	VI	Operating	Periodic monitoring
Final Evaluation			Final Assessment

9 Qualification code per inspected items

		Other components (870-15)	Wind Structures (Welding, Casting & Forging) (870-22)	Wind Mechanical Rotatory Machines (870-23)	Wind Structures (Composites) (870-24)	Wind Electrical Components (870-25)
MANUFACTURING INSPECTION ITEMS	Rotor Nacelle Assembly	x				
	Rotor Blades				x	
	Nacelle & Spin cover(s)				x	
	Rotor Shaft		x			
	Bearings (main, pitch and yaw)		x	x		
	Housings		x			
	Gearbox		x	x		
	Rotor lock and mechanical brake		x	x		
	Frame (main and generator)		x			
	Converter					x
	Generator					x
	Transformer					x
	Tower		x			
	Flanges & Bolted connections		x			
	Sub-structure		x			
	Foundation (steel)		x			
	Foundation (concrete)	x				
	Coating	x				
	Fire & Safety	x				