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Wind energy generation systems - Technical specification for the post-evaluation and retrofitting of wind farms

风能发电系统 风力发电场后评价及改造技术规范

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee for Standardization of Wind Power Generation (SAC/TC50). This document was drafted by: Zhejiang Goldwind Technology Co., Ltd., Beijing Jianheng Certification Center Co., Ltd., China Energy Engineering Group Guangdong Province Electric Power Design and Research Institute Co., Ltd., CRRC Zhuzhou Electric Locomotive Research Institute Co., Ltd. Wind Power Division, Harbin Electric Wind Energy Co., Ltd., Siemens Gamesa Renewable Energy Technology (China) Co., Ltd., Guoneng Star Technology Co., Ltd., Guodian United Power Technology Co., Ltd., Shanghai Energy Source Technology Development Co., Ltd., Jiangsu Goldwind Technology Co., Ltd., China Huaneng Group Clean Energy Technology Research Institute Co., Ltd., Beijing Goldwind Huineng Technology Co., Ltd., CSSC Offshore Wind Power Co., Ltd., Zhongke Yuneng Technology Development Co., Ltd., Goldwind Science & Technology Co., Ltd., Mingyang Smarter Energy Group Co., Ltd., Yunda Energy Technology Group Co., Ltd., PowerChina Fujian Electric Power Survey and Design Institute Co., Ltd. China Electric Power Research Institute Co., Ltd., China Three Gorges Corporation, China Quality Certification Center, Longyuan (Beijing) New Energy Engineering Technology Co., Ltd., Vestas Wind Technology (China) Co., Ltd., Shanghai Electric Wind Power Group Co., Ltd., Beijing Goldwind Chuang Wind Power Equipment Co., Ltd., CGN Wind Power Co., Ltd., Beijing Qianyuan Wind Power Technology Co., Ltd., CRRC Shandong Wind Power Co., Ltd., Envision Energy Co., Ltd., Dongfang Electric New Energy Technology (Chengdu) Co., Ltd., Guangdong Wind Power Generation Co., Ltd., Shandong Electric Power Engineering Consulting Institute Co., Ltd., Runyang Energy Technology Co., Ltd., Yangjiang Offshore Wind Power Laboratory, and Nanjing Avis Transmission Technology Co., Ltd. The main drafters of this document are. Ma Lijuan, Wang Dandan, Fan Yongchun, Hu Kaikai, Xu Ke, Zhang Qingyun, Song Yijia, Wang Yuting, Yin Pengjuan, Deng Yi, Ao Juan, Li Yuan, Zhao Xinlong, Lei Chunyu, Zhang Shuli, Chen Yazhi, Shi Yufeng, Wang Xin, Tan Renshen, Huang Wenyi, Fu Deyi, Li Xiulin, Cui Chunxia, Ma Li, Yan Dongmiao, Ren Huaihui, Qu Shougang,

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This document is intended for use by utilities, creditors, operators, turbine manufacturers, consultancies, regulators, Establish a common basis for wind farm post-evaluation and renovation when institutions, insurance companies and other relevant parties communicate Provide guidance. Post-evaluation of operating wind farms and targeted technical transformation based on post-evaluation indicators are issues that need to be addressed and standardized in the current industry. Difficulty. The two links of wind farm post-evaluation and transformation complement each other at the technical level. Among them, post-design evaluation focuses more on the early stage. The deviation assessment between design and actual operation mainly focuses on micro-site selection, power generation, economy and other dimensions; the post-operation evaluation focuses more on power generation performance. energy, availability, reliability, safety, grid-connected operation, and economy. After the evaluation, the wind farm will be evaluated based on the actual feasible conditions. From small to large renovation plans, when the renovation is officially implemented, it is still necessary to evaluate the safety of the entire plan and finally evaluate the effectiveness of the plan. Practical experience shows that the more comprehensive the evaluation dimensions, the clearer the overall operation of the wind farm will be, and the more conducive it will be to the transformation plan. selection and implementation. The requirements of a certain clause in the change document will not affect the entire wind farm post-evaluation and transformation implementation process. This document is mainly for onshore wind For offshore wind farms, the post-evaluation and transformation technical requirements for offshore wind farms are not fully given, and the offshore wind farms of the same category shall be implemented by reference. Wind power generation system wind farm post evaluation and Renovation Technical Specifications

1 Scope

GB/T 44681-2024 sets the Chinese technical specification for evaluating a wind farm after it has been running and for deciding what to do about it. China built an enormous amount of wind capacity early and much of it is now approaching the end of its design life on turbines that are small by current standards and often on the best sites in the country, which is what makes repowering a live commercial question and this standard a timely one. The document sets out the post-evaluation: the scope and the indicators, the assessment of the resource actually measured against the resource assumed, the energy production and the availability achieved, the condition of the turbines, the towers, the foundations and the electrical infrastructure, the operation and maintenance record and the economic performance. It then sets the technical requirements for retrofitting: the options of life extension, partial replacement and full repowering, the assessment that decides between

them, the requirements on the design and construction of the retrofit, on the reuse of the existing infrastructure and on the grid connection, and the acceptance of the retrofitted farm. For an owner, a lender or an engineering consultancy in China, this is the framework.

This document specifies the relevant technical contents of post-evaluation and transformation of wind farms (hereinafter referred to as "wind farms"), including the Assessment requirements, post-design evaluation of wind farms, post-operation evaluation of wind farms, and wind farm transformation technologies that can optimize power generation and improve reliability Technical requirements and evaluation. This document applies to post-evaluation of onshore wind farms that have been put into operation and have generated operating data, as well as technologies for optimizing power generation and improving reliability. Transformation design evaluation shall be implemented as a reference for offshore wind farms.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 5226.1 Electrical safety of machinery Electrical equipment of machinery Part

3 Terms and definitions

The following terms and definitions apply to this document.