



UL 6141

STANDARD FOR SAFETY

Wind Turbines Permitting Entry of
Personnel

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UL Standard for Safety for Wind Turbines Permitting Entry of Personnel, UL 6141

First Edition, Dated May 20, 2016

Summary of Topics

This revision of ANSI/UL 6141 dated July 30, 2021 includes the addition of reference to the Standard for Energy Storage Systems and Equipment, UL 9540, as UPS functionality; [4.21.1.10](#)

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with Proposal(s) on this subject dated January 8, 2021.

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ANSI/UL 6141-2021

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UL 6141

Standard for Wind Turbines Permitting Entry of Personnel

First Edition

May 20, 2016

This ANSI/UL Standard for Safety consists of the First Edition including revisions through July 30, 2021.

The most recent designation of ANSI/UL 6141 as an American National Standard (ANSI) occurred on July 27, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements cover large wind turbine systems (WT) that are equipped with electrical subassemblies and permit the entry of personnel. With respect to this standard, WT permitting entry of personnel are considered to be wind turbines where a user or service person may, or is intended to, enter the turbine to operate it or perform maintenance. These WT are intended for use in utility-interactive, grid-tied applications that operate in parallel with an electric power system (EPS) to supply power to common or stand-alone loads. This standard includes requirements for WT intended for EPS grid connections at transmission, sub-transmission, and distribution levels depending on the specifications of the specific WT.

1.2 The WT power, control and protection systems are evaluated only to the extent that they function within the manufacturer's specified limits and response times. These control and protection functions are evaluated with respect to risk of electric shock and fire. It is intended that the electrical subassemblies that address power transfer and control and protection functions evaluated per this document are to be coordinated with the mechanical and structural evaluation of the WT in accordance with the IEC 61400 series of documents.

1.3 These requirements do not cover:

- a) Wind turbine generating systems intended for offshore installation,
- b) Mechanical or structural integrity of the WT or subassemblies,
- c) Verification that the manufacturer-defined controls and protection limits maintain the WT within its safe mechanical and structural limits,
- d) Compliance with specific grid interconnection standards or requirements.

1.4 The wind turbine products covered by these requirements are intended to be installed in multiple installation locations and jurisdictions which may include installation codes including, but not limited to, the National Electrical Code, ANSI/NFPA 70, the National Electrical Safety Code (NESC), and NFPA 79, Electrical Standard for Industrial Machinery.

1.5 The wind turbine products covered by this standard are considered to be machines that include inherent internal hazards that make them unsuitable for access by the general public.

1.6 The users, operators and service persons that enter this equipment are expected to have the necessary knowledge of its operation and reasonably foreseeable hazards. These individuals are expected to be equipped with the necessary equipment for the application and hazard.

1.7 The evaluation of products to this standard includes the evaluation of all features and functions incorporated in or available for the WT that can affect compliance of the WT with this standard. This includes references in the documentation for the WT.

1.8 Small WT and electrical subassemblies are defined as wind turbines where a user or service person is not intended or required to enter the WT to operate or perform maintenance on the WT. Small wind systems are covered in the Standard for Small Wind Turbine Systems, UL 6142.

2 General

2.1 Components

2.1.1 Except as indicated in [2.1.2](#), a component of a product covered by this standard shall comply with the requirements for that component. See Appendices [A](#) – [C](#) for a list of standards covering components used in the products covered by this standard.

2.1.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product or system covered by this standard,
- b) Is superseded by a requirement in this standard, or
- c) Is not relied upon for compliance with the National Electric Code, ANSI/NFPA 70, and other U.S. installation codes, provided the component addresses the performance and safety critical aspects necessary for the end application as determined by the evaluation in this standard.

Note: the following provides guidance for item (c) –

- 1) Integral WT components relied upon to interconnect with and/or protect system components, system wiring, loads, etc. shall be of the type(s) defined in the applicable portion of the National Electric Code and shall comply with the applicable portions of the UL standards or standards referenced in the National Electric Code and in Appendix [A](#) for that component type or function. They shall be suitable for the application within the end product application, including the end product ratings and including foreseeable abnormal conditions. Examples include, but are not limited to, branch overcurrent protection, switches, disconnects, wire, cable, connectors, contactors, etc.
- 2) External WT system components (not integral to the WT) shall comply with applicable UL standard for that component.

2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.1.5 Components and subassemblies of the overall WT shall be evaluated and found suitable for their operation over the rated normal operating range of electrical and environmental conditions within the WT per the WT manufacturer's specifications.

2.1.6 These components and subassemblies shall also perform per the manufacturer's specifications during defined abnormal conditions, such as WT shutdown and abnormal electric utility grid conditions.

2.1.7 For additional requirements, reference Section [4](#), Special Components and Subassemblies of Wind Turbines.

2.2 Units of Measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

2.2.2 All references to AC voltages within this standard shall be considered to be RMS unless otherwise specified.