



RDS for WTG
(Guideline based on ISO/IEC 81346)

Industry Guideline for Structuring
Principles and Reference
Designation for Wind Power
systems

1 Forewords

This industry guideline has been created by a working group under the TIM Wind (Technical Information Management for Wind) initiative. The TIM Wind initiative is a collaboration between wind turbine manufacturers (OEMs) and energy companies (operators) with the purpose to agree on technical information management standards for the wind industry.

Participants and authors of the present document are:

DNV
Equinor
GE Vernova Offshore Wind
Nordex Group
Siemens Gamesa Renewable Energy
Statkraft Energi
TenneT
Trønder Energi
Vattenfall
Vestas Wind Systems
Ørsted

2 Introduction

This document provides guideline to the wind industry for the application of the IEC/ISO 81346-series reference designation system (RDS), specifically part-10, Power Supply Systems (RDS-PS). It was developed in response to a demand for guidelines for the application of the ISO/IEC 81346 standard series following recent upgrades to part-1, part-2 and especially part-10, where the second edition, ISO 81346-10:2022 introduced major changes by removing all reference to the previous VGB RDS-PP guidelines.

The basics of reference systems are not explained. It will be assumed that the reader already has a basic understanding of the major concepts. This includes the RDS aspects, the basic RDS semantics and basic RDS classification rules. These can all be found in the IEC 81346 part-1 and 2 of the standard series and further detailed in other available documentation.

8.4 Classes of systems ISO 81346-10 (Power supply systems)

The RDS System Library consist of a three-layer triangle to determine the different kinds of systems used for the Functional, Product, and Host of installation. The “++ Site of installation” uses a different set of tables. (See chapter 12 Site of installation [++])

ISO 81346-10:2022 Annex B, Table B.1 - Classes of power supply systems

ISO 81346-10:2022 Annex B, Table B.2 - Classes of technical systems

IEC 81346-2:2019 Table 3 – Complete classification scheme for component systems

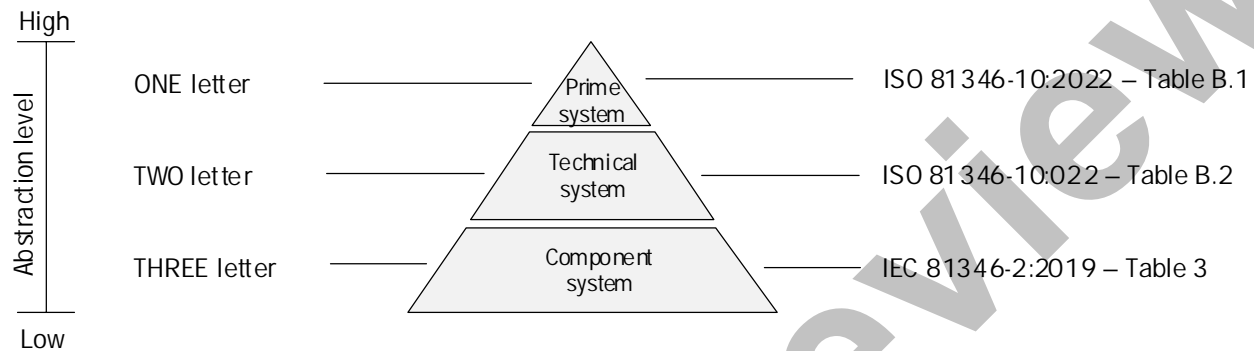


Figure 8-4 RDS System Library from ISO 81346-10

“The figures taken from the ISO 81346-10:2022, *Industrial systems, installations and equipment and industrial products*, is reproduced with the permission of the International Organization for Standardization, ISO. This standard can be obtained from any ISO member and from the website of the ISO Central Secretariat at the following address: www.iso.org. Copyright remains with ISO.”

Classes of Prime systems

The first table, B.1 defines the Prime system. The One-character codes are offered to describe all in the highest level of abstraction. Invariably for wind, two of these codes will predominantly occur, ‘=A’ for energy transforming system and ‘=B’ for electrical transporting system.

Classes of technical systems

The second table, B.2 defines the next level of abstraction, the technical system. Examples of these are Generator, Yaw system and auxiliary power supply systems. The table is divided into category levels containing in total of 50+ two-character codes.

Classes of Component system

The third table, from IEC 81346-2:2019 is generic across all industry subsectors RDS domains; power, construction, aviation, oil & gas, etc., and consists of 600+ three-character codes used to designate the component system level. These class codes, in their two-character form are familiar from legacy reference designation, but new with RDS-PS are three-character variants offering more granularity.

8.9 Main elements of a Wind Turbine Generator

Basically, a WTG consist of a Tower, Nacelle, and Blades. The definition of a Nacelle is a housing which contain the drivetrain and other elements on top of a horizontal axis wind turbine tower.

Example of a DD-WTG.

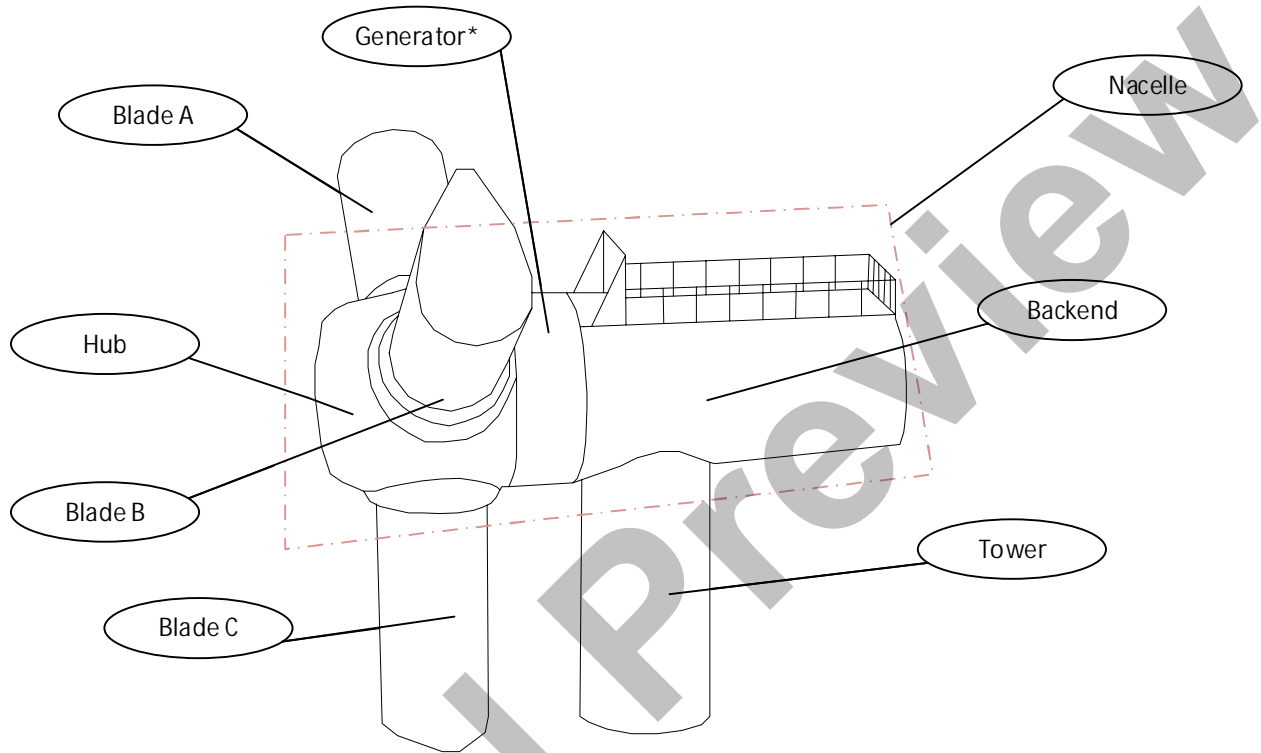


Figure 8-10 Example of Main elements of a Wind Turbine Generator

Note. Applicable only for DD-WTG. On a Geared WTG, the Generator will be placed inside the Backend.

10.3 -A1-AA1 Tower

Often the Tower is a complex design and needs to be sub-divided into sections. A suggestion of a breakdown for the product structure is shown in figure 10.3. By using this order to designate the sections, starting with bottom section, top section and then the middle sections, the number of middle sections won't have any influence in the designation for bottom and top section, meaning they will always be designated the same.

The occurrence Tower should cover all the main parts used for building a Tower. Depending on the complexity each sub-section can be sub-divided to sub-products

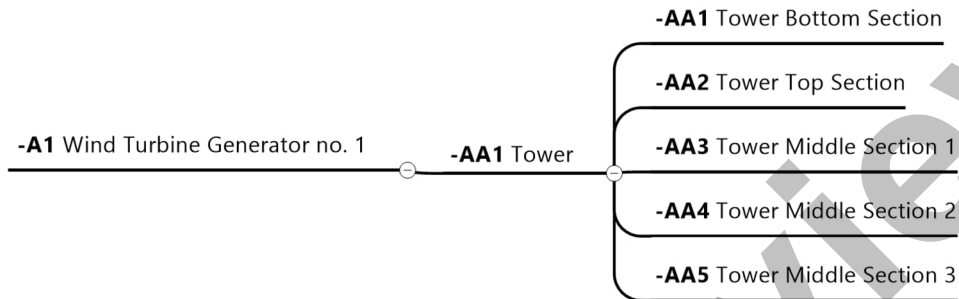


Figure 10-3 Example of a product breakdown view for Tower

Note: It is recommended that systems only related to the Tower itself should be created as sub-systems below the overall Tower, e.g., the Dampening system for the Tower.

10.4 -A1-AA2 Backend

The occurrence Backend covers all the main parts used for building a Backend. Depending on the complexity it can be sub-divided to sub-products.

10.4.1 -A1-AA2-AE1 Casing system/Cover system

Casing/Cover system for the Backend.

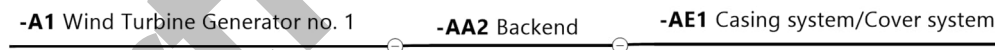


Figure 10-4-1 Example of a Casing system for Backend

10.5 -A1-AA3 Hub

The centre of wind turbine rotor. The hub usually holds the blades in their proper position for maximum aerodynamic efficiency and connects them to the main shaft of the wind turbine.

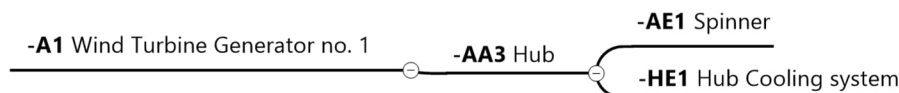


Figure 10-5 Example of a breakdown for the Hub

12.2 Construction entities

From the entities point of view the TWO letter code for a WTG is “LA”. The level marked with the underlining in chapter 12.2 is the starting level for a WTG, in this example “++LA1”. The counting number on this level will be designated from the B.O.P., depending on the combination of Foundation and Transition Piece.

In this Guideline this will be the starting level for the ++Site of installation for a WTG.

Note. This guideline will only be focusing on the WTG itself, seeing it as an asset of its own designated from the Construction Entities, meaning the starting RDS will be from the Two-letter code ++LA1.

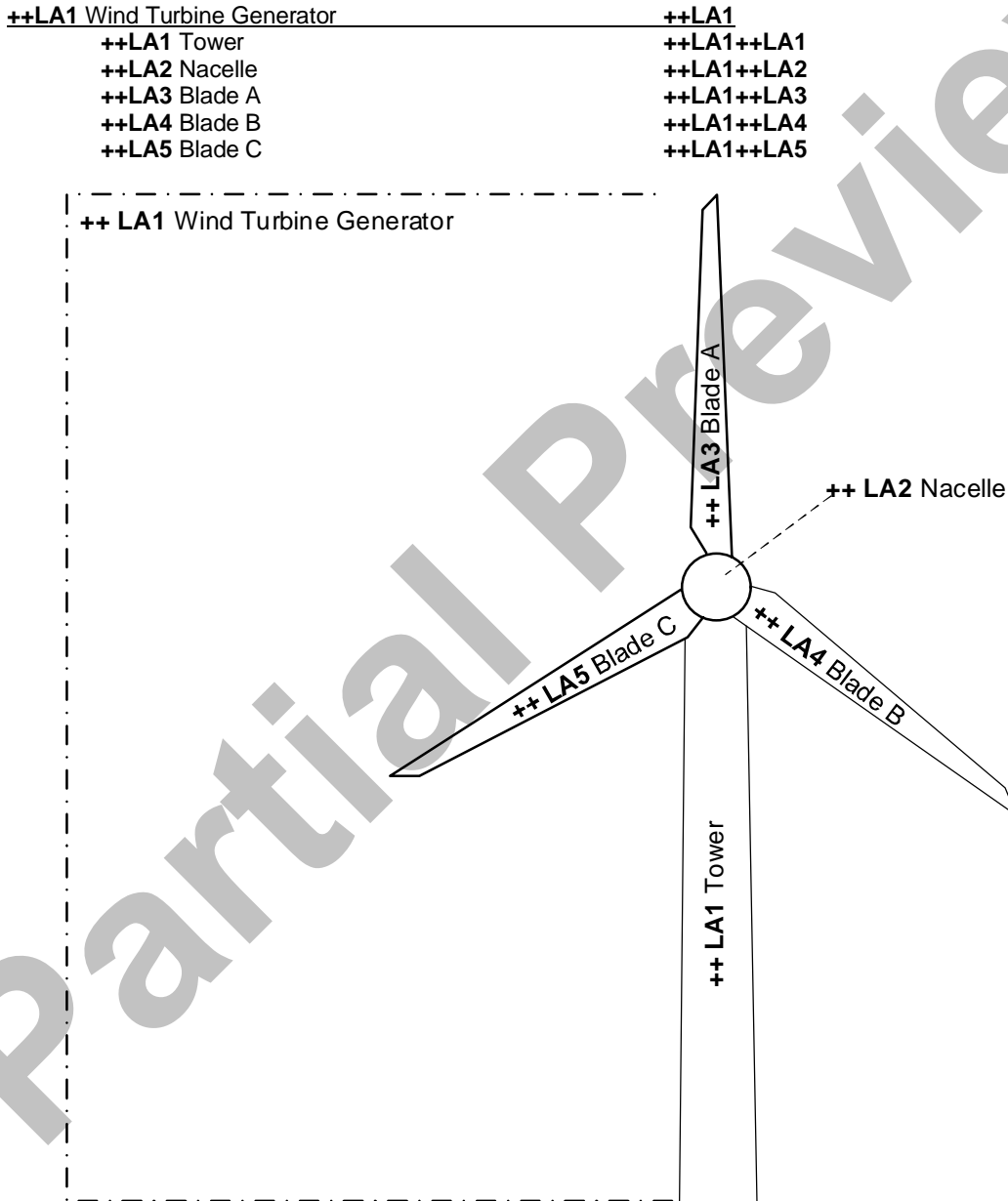


Figure 12-2 ++Site of installation breakdown of a WTG

Annex A (informative)

Functional breakdown structure [=]

| | |
|---|------------------------|
| =A1 Wind Turbine Generator no. 1 | =A1 |
| =AA1 Tower system | =A1=AA1 |
| =AA1 Structural system | =A1=AA1=AA1 |
| =AC1 Platform system | =A1=AA1=AC1 |
| =AC2 Energy routing system | =A1=AA1=AC2 |
| =AD1 Door system | =A1=AA1=AD1 |
| =HE1 HVAC system | =A1=AA1=HE1 |
| =HE1 Cooling system | =A1=AA1=HE1=HE1 |
| =HE2 Dehumidification system | =A1=AA1=HE1=HE2 |
| =AA2 Backend system | =A1=AA2 |
| =AA1 Structural system | =A1=AA2=AA1 |
| =AC1 Platform system | =A1=AA2=AC1 |
| =AC2 Energy routing system | =A1=AA2=AC2 |
| =AD1 Door system | =A1=AA2=AD1 |
| =AE1 Canopy system | =A1=AA2=AE1 |
| =HE1 HVAC system | =A1=AA2=HE1 |
| =HE1 Cooling system | =A1=AA2=HE1=HE1 |
| =HE2 Dehumidification system | =A1=AA2=HE1=HE2 |
| =HB1 Lubrication supply system | =A1=HB1 |
| =HB2 Hydraulic supply system | =A1=HB2 |
| =HD1 Electrical power supply system | =A1=HD1 |
| =JE1 Switchgear system | =A1=HD1=JE1 |
| =JE2 Junction Box system | =A1=HD1=JE2 |
| =HD1 Auxiliary power supply system | =A1=HD1=HD1 |
| =HD2 Power Backup system | =A1=HD1=HD2 |
| =HD3 External Generator system | =A1=HD1=HD3 |
| =HD4 Socket system | =A1=HD1=HD4 |
| =HE1 Cooling supply system | =A1=HE1 |
| =HF1 Lighting system | =A1=HF1 |
| =HF1 Primary lighting system | =A1=HF1=HF1 |
| =HF2 Emergency Lighting system | =A1=HF1=HF2 |
| =HF3 Entrance Lighting system | =A1=HF1=HF3 |
| =HF4 Turbine Marking Lighting system | =A1=HF1=HF4 |
| =JC1 Crane system | =A1=JC1 |
| =JC2 Lift system | =A1=JC2 |
| =JF1 Main shaft system | =A1=JF1 |
| =HB1 Lubrication system | =A1=JF1=HB1 |
| =HE1 Cooling system | =A1=JF1=HE1 |
| =KJ1 Main Bearing system | =A1=JF1=KJ1 |
| =JF2 Gear system | =A1=JF2 |
| =HB1 Lubrication system | =A1=JF2=HB1 |
| =JF1 High speed shaft system | =A1=JF2=JF1 |
| =KJ1 Bearing system | =A1=JF2=KJ1 |
| =JH1 Communication system | =A1=JH1 |
| =JH1 Data Communication system | =A1=JH1=JH1 |
| =JH1 Communication system 1 | =A1=JH1=JH1=JH1 |
| =JH2 Communication system 1 | =A1=JH1=JH1=JH2 |
| =JH2 Human Communication system | =A1=JH1=JH2 |
| =JH2 Scada system | =A1=JH2 |
| =KA1 Braking system | =A1=KA1 |
| =KA2 Locking system | =A1=KA2 |
| =KF1 Converter system | =A1=KF1 |
| =KF1 Converter system 1 | =A1=KF1=KF1 |
| =HE1 Internal Cooling system | =A1=KF1=KF1=HE1 |
| =HE2 Internal Heating system | =A1=KF1=KF1=HE2 |

< To be continued on next page >