Appendix 1 – Documentation

Technical regulation 3.2.5
for wind power plants
above 11 kW

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
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|  |  |
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Revision view

|  |  |  |  |
| --- | --- | --- | --- |
| **Section no.** | **Text** | **Revision** | **Date** |
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| All | Document revised after moving TR 3.2.5 to revision 4.Appendix 1 – Documentation - TR 3.2.5 was prepared in this separate document (the complete technical regulation TR 3.2.5 has doc. no. 13/96336-43, rev. 4).Revision number updated to match the full regulation. | 4 | 29.07.2016 |
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Appendix 1 Documentation

Appendix 1 specifies the documentation requirements for the four *plant categories*; see section 1.2.21 of TR 3.2.5, available at [www.energinet.dk](http://energinet.dk/EN/El/Forskrifter/Technical-regulations/Sider/Forskrifter-for-nettilslutning.aspx#3.2.5)*.*

The documentation (see the specifications in section 8 of TR 3.2.5) must be sent electronically to the *electricity supply undertaking*.

The technical documentation must include configuration parameters and configuration data applicable to the *wind power plant* at the time of commissioning.

All subsections in the appendix must be filled in for the *plant* in question.

If information is changed after the time of commissioning, updated documentation must be submitted as required in section 2.2 of TR 3.2.5.

This template for Appendix 1 for the different *plant categories* is available at the website [www.energinet.dk](http://www.energinet.dk).

* 1. Appendix 1 for plant category A2 not included on the positive list

Please fill in the documentation form with data for the *wind power plant* at the time of commissioning and send it to the electricity *supply undertaking.*

* + 1. Identification

|  |  |
| --- | --- |
| *Plant* | Description of the *plant*: |
| GSRNnumber |  |
| *Plant owner* name and address |  |
| *Plant owner* tel. no. |  |
| *Plant owner* e-mail |  |
| Type/model  |  |
| *Voltage* (nominal) |  |
| *Rated power* (data sheet) |  |

* + 1. Power quality

Please state how each power quality parameter result was achieved.

* + - 1. Voltage changes

|  |  |
| --- | --- |
| Are the voltage changes for the entire *wind power plant* below the limit value?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + - 1. DC content

|  |  |
| --- | --- |
| Does the DC content at normal operation exceed 0.5% of the *rated current*?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + - 1. Asymmetry

|  |  |
| --- | --- |
| Does the asymmetry at normal operation and during faults exceed 16A?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |
| In case of a *wind power plant* made up of single-phase *electricity-generating units*, have you taken measures to ensure that the above limit is not exceeded?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + - 1. Flicker

|  |  |
| --- | --- |
| Is the *flicker* contribution for the entire *wind power plant* below the limit value?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + - 1. Harmonic distortions

|  |  |
| --- | --- |
| Are all the *harmonic distortions* for the entire *wind power plant* below the limit values?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + 1. Connection and synchronisation

|  |  |
| --- | --- |
| Can the *wind power plant* be started and generate power continuously within the *normal production* range limited only by the protective settings?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |
| Do connection and synchronisation occur three minutes, at the earliest, after voltage and frequency have come within the *normal production* range?Where to find documentation that these requirements have been met? | Yes [ ] No [ ]  |

* + 1. Active power control at overfrequency

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a frequency response function?Is the function activated?Where to find documentation that these requirements have been met? | Yes [ ] No [ ] Yes [ ]  No [ ]  |

* + 1. Absolute power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with an absolute power constraint function?Is the function activated?Where to find documentation that these requirements have been met? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Ramp rate constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *ramp rate constraint function?*Is the function activated?Where to find documentation that these requirements have been met? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Reactive power control

|  |  |
| --- | --- |
| Reactive power can be controlled by means of | Q control [ ] Power factor control [ ] Voltage control [ ]  |

* + 1. Q control

|  |  |
| --- | --- |
| Is the control function activated with a set point of \_\_\_\_\_ VAr?(Value may not differ from 0 VAr unless agreed with the *electricity supply undertaking*).Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + 1. Power factor control

|  |  |
| --- | --- |
| Is the control function deactivated?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + 1. Voltage control

|  |  |
| --- | --- |
| Is the control function deactivated?Where to find documentation that this requirement has been met? | Yes [ ] No [ ]  |

* + 1. Protection against electricity system faults
			1. Relay settings

Please state current values at the time of commissioning in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Protective function** | **Symbol** | **Setting** | **Trip time** |
| Overvoltage (step 2) | U>> |  | V |  | ms |
| Overvoltage (step 1) | U> |  | V |  | s |
| Undervoltage (step 1) | U< |  | V |  | s |
| Undervoltage (step 2) | U<< |  | V |  | ms |
| Overfrequency | *f>* |  | Hz |  | ms |
| Underfrequency | *f<* |  | Hz |  | ms |
| Change of frequency | *df/dt* |  | Hz/s |  | ms |

* + 1. Signature

|  |  |
| --- | --- |
| Date of commissioning |  |
| Company |  |
| Person responsible for commissioning |  |
| Signature |  |

* 1. Appendix 1 for plant category A2 included on the positive list

Please fill in the documentation form with data for the *wind power plant* at the time of commissioning and send it to the electricity *supply undertaking.*

* + 1. Identification

|  |  |
| --- | --- |
| *Plant* | Description of the *plant*: |
| GSRN number |  |
| *Plant owner* name and address |  |
| *Plant owner* tel. no. |  |
| *Plant owner* e-mail |  |
| Type/model  |  |
| *Voltage* (nominal) |  |
| *Rated power* (data sheet) |  |

* + 1. Active power control at overfrequency

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *frequency response* function?Is the function activated? | Yes [ ] No [ ] Yes [ ]  No [ ]  |

* + 1. Absolute power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with an *absolute power constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Reactive power control

|  |  |
| --- | --- |
| Reactive power can be controlled by means of | *Q control* [ ] *Power factor control* [ ] Automatic *power factor control* [ ]  |

* + 1. Q control

|  |  |
| --- | --- |
| Is the control function activated with a set point of \_\_\_\_\_ VAr?(Value may not differ from 0 VAr unless agreed with the e*lectricity supply undertaking*). | Yes [ ] No [ ]  |

* + 1. Power factor control

|  |  |
| --- | --- |
| Is the control function deactivated? | Yes [ ] No [ ]  |

* + 1. Voltage control

|  |  |
| --- | --- |
| Is the control function deactivated? | Yes [ ] No [ ]  |

* + 1. Protection against electricity system faults
			1. Relay settings

Please state current values at the time of commissioning in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Protective function** | **Symbol** | **Setting** | **Trip time** |
| Overvoltage (step 2) | U>> |  | V |  | ms |
| Overvoltage (step 1) | U> |  | V |  | s |
| Undervoltage (step 1) | U< |  | V |  | s |
| Undervoltage (step2) | U<< |  | V |  | ms |
| Overfrequency | *f>* |  | Hz |  | ms |
| Underfrequency | *f<* |  | Hz |  | ms |
| Change of frequency | *df/dt* |  | Hz/s |  | ms |

* + 1. Signature

|  |  |
| --- | --- |
| Date of commissioning |  |
| Company |  |
| Person responsible for commissioning |  |
| Signature |  |

* 1. Appendix 1 for plant category B

Please fill in the documentation form with data for the *wind power plant* at the time of commissioning and send it to the electricity *supply undertaking.*

* + 1. Identification

|  |  |
| --- | --- |
| *Plant* | Description of the *plant*: |
| GSRN number |  |
| *Plant* *owner* name and address |  |
| Plant *owner* tel. no. |  |
| *Plant owner* e-mail |  |
| Type/model  |  |
| *Voltage* (nominal)  |  |
| *Rated power* (data sheet) |  |

* + 1. Voltage dip tolerances

|  |  |
| --- | --- |
| Will the *wind power plant* remain connected to the public electricity supply grid during voltage dips as specified in section 3.3.1 in TR 3.2.5? | Yes [ ] No [ ]  |
| Is a simulation enclosed, documenting that the Low Voltage Fault Ride Through (LVFRT) requirements have been met?If No, how is compliance then documented? | Yes [ ] No [ ]  |

* + 1. Voltage quality

Please state how each power quality parameter result was achieved

|  |  |
| --- | --- |
| Were the values calculated? | Yes [ ] No [ ]  |
| Were the values measured? | Yes [ ] No [ ]  |
| Is a report enclosed, documenting that the calculations or measurements meet emission requirements?If No, how are calculations or measurements documented? | Yes [ ] No [ ]  |

* + - 1. DC content

|  |  |
| --- | --- |
| Does the DC content at normal operation exceed 0.5% of the *rated current*? | Yes [ ] No [ ]  |

* + - 1. Asymmetry

|  |  |
| --- | --- |
| Does asymmetry at normal operation and during faults exceed 16A? | Yes [ ] No [ ]  |
| In case of a *wind power plant* made up of single-phase *electricity-generating units*, have you taken measures to ensure that the above limit is not exceeded? | Yes [ ] No [ ]  |

* + - 1. Flicker

|  |  |
| --- | --- |
| Is the flicker contribution for the entire *wind power plant* below the limit value? | Yes [ ] No [ ]  |

* + - 1. Harmonic distortions

|  |  |
| --- | --- |
| Are all *harmonic distortions* for the entire *wind power plant* below the limit values? | Yes [ ] No [ ]  |

* + - 1. Interharmonic distortions

|  |  |
| --- | --- |
| Are all the inter*harmonic distortions* for the entire *wind power plant* below the limit values? | Yes [ ] No [ ]  |

* + - 1. Distortions from 2-9 kHz

|  |  |
| --- | --- |
| Is the emission of distortions with frequencies in the 2-9 kHz range lower than 0.2% of the *rated current* *In*? | Yes [ ] No [ ]  |

* + 1. Connection and synchronisation

|  |  |
| --- | --- |
| Can the *wind power plant* be started and generate power continuously within the *normal production* range limited only by the protective settings? | Yes [ ] No [ ]  |
| Do connection and synchronisation occur three minutes, at the earliest, after voltage and frequency have come within the *normal production* range? | Yes [ ] No [ ]  |

* + 1. Active power control at overfrequency

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *frequency response* function? | Yes [ ] No [ ]  |

* + 1. Absolute power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with an *absolute power constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Ramp rate constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *ramp rate constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Reactive power control

|  |  |
| --- | --- |
| Reactive power can be controlled by means of | *Q control* [ ] *Power factor control* [ ] *Voltage control* [ ]  |

* + 1. Q control

|  |  |
| --- | --- |
| Is the control function activated with a set point of \_\_\_\_\_ VAr?(Value may not differ from 0 VAr unless agreed with the *electricity supply undertaking*). | Yes [ ] No [ ]  |

* + 1. Power factor control

|  |  |
| --- | --- |
| Is the control function deactivated? | Yes [ ] No [ ]  |

* + 1. Voltage control

|  |  |
| --- | --- |
| Is the control function deactivated? | Yes [ ] No [ ]  |

* + 1. Protection against electricity system faults
			1. Relay settings

Please state current values at the time of commissioning in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Protective function** | **Symbol** | **Setting** | **Trip time** |
| Overvoltage (step 2) | U>> |  | V |  | ms |
| Overvoltage (step 1) | U> |  | V |  | s |
| Undervoltage (step 1) | U< |  | V |  | s |
| Undervoltage (step 2) | U<< |  | V |  | ms |
| Overfrequency | f> |  | Hz |  | ms |
| Underfrequency | f< |  | Hz |  | ms |
| Change of frequency | df/dt |  | Hz/s |  | ms |

* + 1. Single-line representation

|  |  |
| --- | --- |
| Is a single-line representation for the *wind power plant* enclosed with the documentation?If No, when will the final single-line representation be provided? | Yes [ ] No [ ]  |

* + 1. Signature

|  |  |
| --- | --- |
| Date of commissioning |  |
| Company |  |
| Person responsible for commissioning |  |
| Signature |  |

* 1. Appendix 1 for plant category C

Please fill in the documentation form with preliminary data for the *wind power plant* and send it to the electricity *supply undertaking* no later than three months **before** the date of commissioning.

Please fill in the documentation form with specific data for the entire *wind power plant* and send it to the electricity *supply undertaking* no later than three months **after** the date of commissioning.

The required documentation comprises the following:

* + 1. Identification

|  |  |
| --- | --- |
| *Plant* | Description of the *plant*: |
| GSRNnumber |  |
| *Plant owner* name and address |  |
| *Plant owner* tel. no. |  |
| *Plant owner* e-mail |  |
| Type/model  |  |
| *Voltage* (nominal)  |  |
| *Rated power* (data sheet) |  |

* + 1. Voltage dip tolerances

|  |  |
| --- | --- |
| Will the *wind power plant* remain connected to the *public electricity supply grid* during voltage dips as specified in section 3.3.1 of TR 3.2.5? | Yes [ ] No [ ]  |
| Is a simulation enclosed, documenting that the Low Voltage Fault Ride Through (LVFRT) requirements have been met? If No, how is compliance then documented?  | Yes [ ] No [ ]  |

* + 1. Voltage quality

Please state how each power quality parameter result was achieved.

|  |  |
| --- | --- |
| Were the values calculated?  | Yes [ ] No [ ]  |
| Were the values measured?  | Yes [ ] No [ ]  |
| Is a report enclosed, documenting that calculations or measurements meet emission requirements?If No, how are calculations or measurements documented? | Yes [ ] No [ ]  |

* + - 1. DC content

|  |  |
| --- | --- |
| Does the DC content at normal operation exceed 0.5% of *rated current*? | Yes [ ] No [ ]  |

* + - 1. Asymmetry

|  |  |
| --- | --- |
| Does the asymmetry at normal operation and during faults exceed 16A? | Yes [ ] No [ ]  |
| In case of a *wind power plant* made up of single-phase *electricity-generating units*, have you taken measures to ensure that the above limit is not exceeded? | Yes [ ] No [ ]  |

* + - 1. Flicker

|  |  |
| --- | --- |
| Is the flicker contribution for the *wind power plant* below the limit value? | Yes [ ] No [ ]  |

* + - 1. Harmonic distortions

|  |  |
| --- | --- |
| Are all *harmonic distortions* for the *wind power plant* below the limit values? | Yes [ ] No [ ]  |

* + - 1. Interharmonic distortions

|  |  |
| --- | --- |
| Are all inter*harmonic* *distortions* for the *wind power plant* below the limit values? | Yes [ ] No [ ]  |

* + - 1. Distortions from 2-9 kHz

|  |  |
| --- | --- |
| Emission of distortions with frequencies in the 2-9 kHz range is determined by the *electricity supply undertaking*. Is the requirement met? | Yes [ ] No [ ]  |

* + 1. Connection and synchronisation

|  |  |
| --- | --- |
| Can the *wind power plant* be started and generate power continuously within the *normal production* range, limited only by the protective settings? | Yes [ ] No [ ]  |
| Do connection and synchronisation occur three minutes, at the earliest, after voltage and frequency have come within the *normal production* range? | Yes [ ] No [ ]  |

* + 1. Active power control at overfrequency

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a frequency response function? | Yes [ ] No [ ]  |

* + 1. Frequency control

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a frequency control function as specified in section 5.2.2 in TR 3.2.5? | Yes [ ]  No [ ]  |

* + 1. Absolute power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with an *absolute power constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Delta power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *delta power constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Ramp rate constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *ramp rate constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. System protection

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a system protection function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Reactive power control

|  |  |
| --- | --- |
| Reactive power can be controlled by means of | *Q control* [ ] *Power factor control* [ ] *Voltage control* [ ]  |

* + 1. Q control

|  |  |
| --- | --- |
| Is the control function activated with a set point of \_\_\_\_\_ VAr?(Value may not differ from 0 VAr unless agreed with the *electricity supply undertaking*).  | Yes [ ] No [ ]  |

* + 1. Power factor control

|  |  |
| --- | --- |
| Is the control function deactivated? | Yes [ ] No [ ]  |

* + 1. Voltage control

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *voltage control* function as specified in section 5.3.3 in TR 3.2.5? | Yes [ ]  No [ ]  |

* + 1. Protection against electricity system faults
			1. Relay settings

Please state current values at the time of commissioning in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Protective function** | **Symbol** | **Setting** | **Trip time** |
| Overvoltage (step 3) | U>>> |  | V |  | ms |
| Overvoltage (step 2) | U>> |  | V |  | ms |
| Overvoltage (step 1) | U> |  | V |  | s |
| Undervoltage (step 1) | U< |  | V |  | s |
| Overfrequency | *f>* |  | Hz |  | ms |
| Underfrequency | *f<* |  | Hz |  | ms |
| Change of frequency | *df/dt* |  | Hz/s |  | ms |

* + 1. Single-line representation

|  |  |
| --- | --- |
| Is a single-line representation for the *wind power plant* enclosed with the documentation?If No, when will the final single-line representation be provided? | Yes [ ] No [ ]  |

* + 1. PQ diagram

|  |  |
| --- | --- |
| Has the final PQ diagram been submitted to the *electricity supply undertaking*?If No, when will the final PQ diagram be provided? | Yes [ ]  No [ ]  |

* + 1. Signal list

|  |  |
| --- | --- |
| Has the final signal list been submitted to the *electricity supply undertaking*?If No, when will the final signal list be provided? | Yes [ ]  No [ ]  |

* + 1. Simulation model

|  |  |
| --- | --- |
| Has the electrical simulation model for the *wind power plant* been submitted to the *electricity supply undertaking*?If No, when will the final simulation model be provided? | Yes [ ]  No [ ]  |

* + 1. Verification report

|  |  |
| --- | --- |
| Has the verification report been submitted to the *electricity supply undertaking*?If No, when will the verification report be provided? | Yes [ ]  No [ ]  |

* + 1. Signature

|  |  |
| --- | --- |
| Date of commissioning |  |
| Company |  |
| Person responsible for commissioning |  |
| Signature |  |

* 1. Appendix 1 for plant category D

Please fill in the documentation form with preliminary data for the *wind power plant* and send it to the electricity *supply undertaking* no later than three months **before** the date of commissioning.

Please fill in the documentation form with specific data for the entire *wind power plant* and send it to the electricity *supply undertaking* no later than three months **after** the date of commissioning.

The required documentation comprises the following:

* + 1. Identification

|  |  |
| --- | --- |
| *Plant* | Description of the *plant*: |
| GSRN number |  |
| *Plant owner* name and address |  |
| *Plant owner* tel. no. |  |
| *Plant owner* e-mail |  |
| Type/model  |  |
| Voltage (nominal)  |  |
| *Rated power* (data sheet) |  |

* + 1. Voltage dip tolerances

|  |  |
| --- | --- |
| Will the *wind power plant* remain connected to the *public electricity supply grid* during voltage dips as specified in section 3.3.1 in TR 3.2.5? | Yes [ ] No [ ]  |
| Is a simulation enclosed, documenting that the Low Voltage Fault Ride Through (LVFRT) requirements have been met?If No, how is compliance then documented? | Yes [ ] No [ ]  |

* + 1. Voltage quality

Please state how each power quality parameter result was achieved.

|  |  |
| --- | --- |
| Have the values been calculated? | Yes [ ] No [ ]  |
| Were the values measured? | Yes [ ] No [ ]  |
| Is a report enclosed, documenting that the calculations or measurements meet the emission requirements?If No, how are the calculations or measurements documented? | Yes [ ] No [ ]  |

* + - 1. DC content

|  |  |
| --- | --- |
| Does the DC content at normal operation exceed 0.5% of the *rated current*? | Yes [ ] No [ ]  |

* + - 1. Asymmetry

|  |  |
| --- | --- |
| Does the asymmetry at normal operation and during faults exceed 16A? | Yes [ ] No [ ]  |
| In case of a *wind power plant* made up of single-phase *electricity-generating units*, have you taken measures to ensure that the above limit is not exceeded? | Yes [ ] No [ ]  |

* + - 1. Flicker

|  |  |
| --- | --- |
| Is the *flicker* contribution for the *wind power plant* below the limit value? | Yes [ ] No [ ]  |

* + - 1. Harmonic distortions

|  |  |
| --- | --- |
| Are all *harmonic distortions* for the *wind power plant* below the limit values? | Yes [ ] No [ ]  |

* + - 1. Interharmonic distortions

|  |  |
| --- | --- |
| Are all inter*harmonic distortions* for the *wind power plant* below the limit values? | Yes [ ] No [ ]  |

* + - 1. Distortions from 2-9 kHz

|  |  |
| --- | --- |
| Emission of distortions with frequencies in the 2-9 kHz range is determined by the *electricity supply undertaking*. Is the requirement met? | Yes [ ] No [ ]  |

* + 1. Connection and synchronisation

|  |  |
| --- | --- |
| Can the *wind power plant* be started and generate power continuously within the *normal production* range limited only by the protective settings? | Yes [ ] No [ ]  |
| Do connection and synchronisation occur three minutes, at the earliest, after voltage and frequency have come within the *normal production* range? | Yes [ ] No [ ]  |

* + 1. Active power control at overfrequency

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *frequency response* function? | Yes [ ] No [ ]  |

* + 1. Frequency control

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *frequency control* function as specified in section 5.2.2 in TR 3.2.5? | Yes [ ]  No [ ]  |

* + 1. Absolute power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with an *absolute power constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Delta power constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *delta power constraint* function*?*Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Ramp rate constraint function

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *ramp rate constraint* function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. System protection

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a system protection function?Is the function activated? | Yes [ ]  No [ ] Yes [ ]  No [ ]  |

* + 1. Reactive power control

|  |  |
| --- | --- |
| Reactive power can be controlled by means of | Q control [ ] Power factor control [ ] Voltage control [ ]  |

* + 1. Q control

|  |  |
| --- | --- |
| Is the control function activated with a set point of \_\_\_\_\_ VAr?(Value may not differ from 0 VAr, unless agreed with the *electricity supply undertaking*). | Yes [ ] No [ ]  |

* + 1. Power factor control

|  |  |
| --- | --- |
| Is the control function deactivated? | Yes [ ] No [ ]  |

* + 1. Voltage control

|  |  |
| --- | --- |
| Is the *wind power plant* equipped with a *voltage control* function as specified in section 5.3.3 of TR 3.2.5? | Yes [ ]  No [ ]  |

* + 1. Protection against electricity system faults
			1. Relay settings

Please state current values at the time of commissioning in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Protective function** | **Symbol** | **Setting** | **Trip time** |
| Overvoltage (step 3) | U>>> |  | V |  | ms |
| Overvoltage (step 2) | U>> |  | V |  | ms |
| Overvoltage (step 1) | U> |  | V |  | s |
| Undervoltage (step 1) | U< |  | V |  | s |
| Overfrequency | *f>* |  | Hz |  | ms |
| Underfrequency | *f<* |  | Hz |  | ms |
| Change of frequency | *df/dt* |  | Hz/s |  | ms |

* + 1. Single-line representation

|  |  |
| --- | --- |
| Is a single-line representation for the *wind power plant* enclosed with the documentation?If No, when will the final single-line representation be provided? | Yes [ ] No [ ]  |

* + 1. PQ diagram

|  |  |
| --- | --- |
| Has the final PQ diagram been submitted to the *electricity supply undertaking*?If No, when will the final PQ diagram be provided? | Yes [ ]  No [ ]  |

* + 1. Signal list

|  |  |
| --- | --- |
| Has the final signal list been submitted to the *electricity supply undertaking*?If No, when will the final signal list be provided? | Yes [ ]  No [ ]  |

* + 1. Simulation model

|  |  |
| --- | --- |
| Has the electrical simulation model for the *wind power plant* been submitted to the *electricity supply undertaking*?If No, when will the final simulation model be provided? | Yes [ ]  No [ ]  |

* + 1. Verification report

|  |  |
| --- | --- |
| Has the verification report been submitted to the *electricity supply undertaking*?If No, when will the verification report be provided? | Yes [ ]  No [ ]  |

* + 1. Signature

|  |  |
| --- | --- |
| Date of commissioning |  |
| Company |  |
| Person responsible for commissioning |  |
| Signature |  |