Rotor blade inspection report

|  |  |  |
| --- | --- | --- |
| **Overview WTG data** | | |
| Wind Farm | | Meerwind Süd / Ost |
| Location | | Esjberg |
| WTG model | | Siemens 3.6 MW |
| WTG number | |  |
| WTG ID |  |  |
| Customer | | WindMW Service GmbH  Schleusenstraße 12  D - 27568 Bremerhaven |
| Inspection type | | External blade inspection |

|  |  |  |
| --- | --- | --- |
| **Overview rotor blades** | | |
| Blade type | B58 | |
| Set number | 519 | |
| Blade number A | 580999999 | |
| Blade number B |  | |
| Blade number C |  | |
| Date of Inspection |  | |
| Service company | GMA Werkstoffprüfung GmbH | |
| Name of Inspectors | Peter Szaszak |  |
| Jimmy Carlos |  |
|  |  |
| Inspection type (e.g. EOW, regular inspection) | External blade inspection EOW | |

# Inspection results

|  |  |
| --- | --- |
| Damage ID |  |
| Area: |  |
| Description |  |
| Category: |  |
| Comments |  |

## Inspection results of blade B, number: 580438200 outside

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # Finding | Position: Side /Edge | LE | DF from | 44 | PD in [%] from | 0 | Size in [mm] | 1000x50 |
| 580438200-1 | Category | 2 | to in [m] | 45 | to | 0 | Depth in [mm] | n.a. |
| Damage description  e.g. damaged layers,  affected area (bonding) | | leading edge erosion; on surface laminate | | | | | | |
| Overview picture | | | Detailed picture (visible scale!) | | | Optional picture | | |
| C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_1_1.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_1_2.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_1_3.JPG | | |
| Comment of inspector: | | | | | | | | |
| # Finding | Position: Side /Edge | LE | DF from | 48 | PD in [%] from | 0 | Size in [mm] | 4000x50 |
| 580438200-2 | Category | 2 | to in [m] | 52 | to | 0 | Depth in [mm] | n.a. |
| Damage description  e.g. damaged layers,  affected area (bonding) | | leading edge erosion; on surface coating | | | | | | |
| Overview picture | | | Detailed picture (visible scale!) | | | Optional picture | | |
| C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_2_1.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_2_2.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_2_3.JPG | | |
| Comment of inspector: | | | | | | | | |

## Inspection results of blade B, number: 580438200 outside

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # Finding | Position: Side /Edge | LE | DF from | 52 | PD in [%] from | 0 | Size in [mm] | 6000x70 |
| 580435800-1 | Category | 3 | to in [m] | 58 | to | 0 | Depth in [mm] | n.a. |
| Damage description  e.g. damaged layers,  affected area (bonding) | | leading edge erosion; on multilayer laminate | | | | | | |
| Overview picture | | | Detailed picture (visible scale!) | | | Optional picture | | |
| C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_3_1.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_3_2.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_3_4.JPG | | |
| Comment of inspector: | | | | | | | | |

## Inspection results of blade C, number: 580341900 outside

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # Finding | Position: Side /Edge | LE | DF from | 44 | PD in [%] from | 0 | Size in [mm] | 8000x50 |
| 580341900-1 | Category | 2 | to in [m] | 52 | to | 0 | Depth in [mm] | n.a. |
| Damage description  e.g. damaged layers,  affected area (bonding) | | leading edge erosion; on surface coating | | | | | | |
| Overview picture | | | Detailed picture (visible scale!) | | | Optional picture | | |
| C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_1_1.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_1_2.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_1_3.JPG | | |
| Comment of inspector: | | | | | | | | |
| # Finding | Position: Side /Edge | LE | DF from | 52 | PD in [%] from | 0 | Size in [mm] | 6000x70 |
| 580341900-2 | Category | 3 | to in [m] | 58 | to | 0 | Depth in [mm] | n.a. |
| Damage description  e.g. damaged layers,  affected area (bonding) | | leading edge erosion; on multilayer laminate | | | | | | |
| Overview picture | | | Detailed picture (visible scale!) | | | Optional picture | | |
| C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_2_1.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_2_2.JPG | | | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_2_4.JPG | | |
| Comment of inspector: | | | | | | | | |

# Results of measurement of the LPS

|  |  |  |  |
| --- | --- | --- | --- |
| Measurement device type |  | Last calibration date |  |
| Calibration expire date |  |

## Inspection results of blade A, number: 580435800 outside

NOTE: Receptor- and equipotential bonding- numbering starts from the blade root to tip. (Receptor 1 is close to root)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Position: Side /Edge | DF: | DF: | DF: | DF: |
| Receptor 1 | Receptor 2 | Receptor 3 | Receptor 4 |
| PS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_Rezeptor_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_Rezeptor_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_Rezeptor_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_Rezeptor_4_Tip.JPG |
| Ohm Ω: | 0.012 | 0.020 | 0.129 | 0.024 |
| PS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_PS_4_Tip.JPG |
|  | | | | |
| SS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_Rezeptor_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_Rezeptor_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_Rezeptor_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_Rezeptor_4_Tip.JPG |
| Ohm Ω: | 0.012 | 0.020 | 0.129 | 0.024 |
| SS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade A 580435800\580435800_SS_4_Tip.JPG |

## Inspection results of blade B, number: 580438200 outside

NOTE: Receptor- and equipotential bonding- numbering starts from the blade root to tip. (Receptor 1 is close to root)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Position: Side /Edge | DF: | DF: | DF: | DF: |
| Receptor 1 | Receptor 2 | Receptor 3 | Receptor 4 |
| PS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_Rezeptor_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_Rezeptor_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_Rezeptor_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_Rezeptor_4.JPG |
| Ohm Ω: | 0.049 | 0.022 | 0.029 | 0.027 |
| PS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_PS_4.JPG |
|  | | | | |
| SS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_Rezeptor_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_Rezeptor_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_Rezeptor_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_Rezeptor_4.JPG |
| Ohm Ω: | 0.048 | 0.022 | 0.029 | 0.027 |
| SS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade B 580438200\580438200_SS_4.JPG |

## Inspection results of blade C, number: 580341900 outside

NOTE: Receptor- and equipotential bonding- numbering starts from the blade root to tip (Receptor 1 is close to root)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Position: Side /Edge | DF: | DF: | DF: | DF: |
| Receptor 1 | Receptor 2 | Receptor 3 | Receptor 4 |
| PS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_Rezeptor_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_Rezeptor_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_Rezeptor_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_Rezeptor_4.JPG |
| Ohm Ω: | 0.013 | 0.019 | 0.024 | 0.023 |
| PS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_PS_4.JPG |
|  | | | | |
| SS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_Rezeptor_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_Rezeptor_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_Rezeptor_3.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_Rezeptor_4.JPG |
| Ohm Ω: | 0.012 | 0.019 | 0.019 | 0.024 |
| SS | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_1.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_2.JPG | C:\Users\p.szaszak\Desktop\WindMW\M80\External\Blade C 580341900\580341900_SS_4.JPG |

|  |  |  |
| --- | --- | --- |
| The author of an Inspection Report approves that the works were done and documented in all conscience. All work steps were done according to the provided instructions. | | |
| This report was completed by:  Name & digital signature: | Rado |  |
| Protocol number:  Company: | 20200819\_E\_80  GMA Werkstoffprüfung |  |
| Location / Date: | Stade / 28.08.2020 |  |
|  | | |