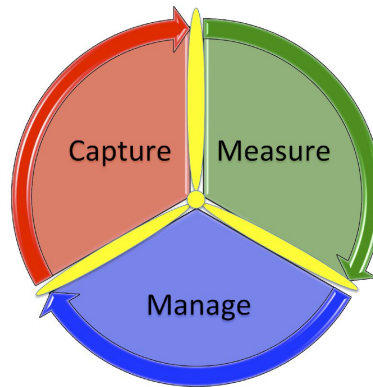




Asset Integrity Survey Services



Wind Turbine Blade Inspection Report

Inspection Date: Jun 05, 2017

Client:
Site: Shroyer Wind Farm
Turbine: MW2 WTG-27

Contact:
USP: BladeEdge-Westrem



Executive Summary

An inspection was completed on **Jun 05, 2017**, for Turbine **MW2 WTG-27** at **Shroyer Wind Farm**. This report includes condition assessments, asset details, mosaics of blade sides (when available), damage analysis, and contact information for groups or individuals involved in the inspection. This report was generated on **Aug 08, 2019** and may not include analysis done after that time.

Inspection

ID...	ID #27
Type...	UAV
Begin Date...	Jun 05, 2017
End Date...	Jun 05, 2017
Turbine...	MW2 WTG-27

Flight Operation

Site...	Shroyer Wind Farm
USP...	BladeEdge-Westrem
Date Range...	Jun 04, 2017 to Sep 12, 2017

Turbine

ID...	ID #19
Name...	MW2 WTG-27
Model...	Vestas, Vestas, V100 1.8-MW
Hub Height...	100m

Blade	ID	Model	Warranty Start	Warranty End
1	20	Vestas, Vestas , V100 49m, (49m)		
2	21	Vestas, Vestas , V100 49m, (49m)		
3	22	Vestas, Vestas , V100 49m, (49m)		

Inspection Analytics Overview

The overview provides a damage classification and condition assessment at a glance. Beyond summarizing by blade and the blade side, a color legend is introduced to help quickly identify status of severity using the following legend:

Condition Assessment Dashboard:

High Pressure



Low Pressure



Leading Edge



Trailing Edge



Condition Assessment Rollup:

Turbine Summary	HP	LP	LE	TE	Turbine Total
Side Total	33	18	26	0	77

Blade 1	HP	LP	LE	TE	Severity Total
(0) No Indications	0	0	0	0	0
(1) Minor Cosmetic	27	5	9	0	41
(2) Major Cosmetic	3	2	0	0	5
(3) Minor Structural	0	0	0	0	0
(4) Moderate Structural	0	0	10	0	10
(5) Major Structural	0	0	0	0	0
(?) No Assessment	0	0	0	0	0
Blade Side Total	30	7	19	0	56

Blade 2	HP	LP	LE	TE	Severity Total
(0) No Indications	0	0	0	0	0
(1) Minor Cosmetic	3	0	1	0	4
(2) Major Cosmetic	0	4	3	0	7
(3) Minor Structural	0	0	0	0	0
(4) Moderate Structural	0	0	0	0	0
(5) Major Structural	0	0	0	0	0
(?) No Assessment	0	0	0	0	0
Blade Side Total	3	4	4	0	11

Blade 3	HP	LP	LE	TE	Severity Total
(0) No Indications	0	0	0	0	0
(1) Minor Cosmetic	0	0	3	0	3
(2) Major Cosmetic	0	7	0	0	7
(3) Minor Structural	0	0	0	0	0
(4) Moderate Structural	0	0	0	0	0
(5) Major Structural	0	0	0	0	0
(?) No Assessment	0	0	0	0	0
Blade Side Total	0	7	3	0	10



Shroyer Wind Farm

Asset Integrity Survey Services

Turbine MW2 WTG-27

Legend for Severity*	(0) No Indications	(1) Minor Cosmetic	(2) Major Cosmetic	(3) Minor Structural	(4) Moderate Structural	(5) Major Structural
Turbine Status:	Continue to run	Continue to run	Continue to run	Continue to run	Continue to run	Take Off-line
Damage Size:	na	50 x 50 mm	50 x 50 mm	200 x 200 mm	1000 x 1000 mm	na
Damage Condition:	No Repairs	No Repairs	Low Priority Repairs	Low Priority Repairs	Medium Priority Repairs	High Priority Repairs
Next Inspection:	1 Year	1 Year	1 Year	6 Months	3 Months	Repair/ Replace

*Condition Assessment based on EPRI Standards.



Inspection Analytics Details

Blade 1


High Pressure




2






Damage Summary (30 total)

2	3	Chip
1	2	Chip
1	24	GCE
1	1	Stain

Feature Image	EPRI	Assessment Detail			
 <p>Original: DJI_0019.DNG (Larger Version)</p>	1	<table border="1"> <tr> <td>Chip</td> <td>629x,1079y</td> <td>Mosaic 3014x,1061y</td> </tr> </table>	Chip	629x,1079y	Mosaic 3014x,1061y
Chip	629x,1079y	Mosaic 3014x,1061y			

 <p style="text-align: center; margin-top: 10px;">Original: DJI_0020.DNG (Larger Version)</p>	<div style="border: 1px solid black; background-color: yellow; padding: 5px; width: 30px; margin: 0 auto;">1</div>																						
 <p style="text-align: center; margin-top: 10px;">Original: DJI_0056.DNG (Larger Version)</p>	<div style="border: 1px solid black; background-color: yellow; padding: 5px; width: 30px; margin: 0 auto;">1</div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1342x,772y</td> <td style="background-color: #e6f2ff;">Mosaic 12168x,1296 y</td> </tr> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1318x,942y</td> <td style="background-color: #e6f2ff;">Mosaic 12234x,1294 y</td> </tr> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1318x,943y</td> <td style="background-color: #e6f2ff;">Mosaic 12235x,1294 y</td> </tr> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1318x,944y</td> <td style="background-color: #e6f2ff;">Mosaic 12235x,1294 y</td> </tr> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1315x,945y</td> <td style="background-color: #e6f2ff;">Mosaic 12236x,1295 y</td> </tr> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1315x,946y</td> <td style="background-color: #e6f2ff;">Mosaic 12236x,1295 y</td> </tr> <tr> <td style="background-color: #e6f2ff;">GCE</td> <td style="background-color: #e6f2ff;">1315x,952y</td> <td style="background-color: #e6f2ff;">Mosaic 12238x,1295 y</td> </tr> </table>	GCE	1342x,772y	Mosaic 12168x,1296 y	GCE	1318x,942y	Mosaic 12234x,1294 y	GCE	1318x,943y	Mosaic 12235x,1294 y	GCE	1318x,944y	Mosaic 12235x,1294 y	GCE	1315x,945y	Mosaic 12236x,1295 y	GCE	1315x,946y	Mosaic 12236x,1295 y	GCE	1315x,952y	Mosaic 12238x,1295 y
GCE	1342x,772y	Mosaic 12168x,1296 y																					
GCE	1318x,942y	Mosaic 12234x,1294 y																					
GCE	1318x,943y	Mosaic 12235x,1294 y																					
GCE	1318x,944y	Mosaic 12235x,1294 y																					
GCE	1315x,945y	Mosaic 12236x,1295 y																					
GCE	1315x,946y	Mosaic 12236x,1295 y																					
GCE	1315x,952y	Mosaic 12238x,1295 y																					
	<div style="border: 1px solid black; background-color: yellow; padding: 5px; width: 30px; margin: 0 auto;">2</div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e6f2ff;">Chip</td> <td style="background-color: #e6f2ff;">1023x,875y</td> <td style="background-color: #e6f2ff;">Mosaic 9359x,1244y</td> </tr> <tr> <td style="background-color: #e6f2ff;">Chip</td> <td style="background-color: #e6f2ff;">968x,1108y</td> <td style="background-color: #e6f2ff;">Mosaic 9451x,1252y</td> </tr> <tr> <td style="background-color: #e6f2ff;">Chip</td> <td style="background-color: #e6f2ff;">936x,1219y</td> <td style="background-color: #e6f2ff;">Mosaic 9506x,1260y</td> </tr> </table>	Chip	1023x,875y	Mosaic 9359x,1244y	Chip	968x,1108y	Mosaic 9451x,1252y	Chip	936x,1219y	Mosaic 9506x,1260y												
Chip	1023x,875y	Mosaic 9359x,1244y																					
Chip	968x,1108y	Mosaic 9451x,1252y																					
Chip	936x,1219y	Mosaic 9506x,1260y																					

Original: DJI_0044.DNG (Larger Version)					
	1	<table border="1"> <tr> <td>Stain</td> <td>437x,1165y</td> <td>Mosaic 4660x,1146y</td> </tr> </table>	Stain	437x,1165y	Mosaic 4660x,1146y
Stain	437x,1165y	Mosaic 4660x,1146y			
Original: DJI_0026.DNG (Larger Version)					
	1	<table border="1"> <tr> <td>GCE</td> <td>607x,1941y</td> <td>Mosaic 11874x,1335 y</td> </tr> </table>	GCE	607x,1941y	Mosaic 11874x,1335 y
GCE	607x,1941y	Mosaic 11874x,1335 y			
Original: DJI_0052.DNG (Larger Version)					
	1	<table border="1"> <tr> <td>GCE</td> <td>946x,1549y</td> <td>Mosaic 11950x,1318 y</td> </tr> </table>	GCE	946x,1549y	Mosaic 11950x,1318 y
GCE	946x,1549y	Mosaic 11950x,1318 y			
Original: DJI_0053.DNG (Larger Version)					



Original: DJI_0054.DNG (Larger Version)

1

GCE	1099x,433y	Mosaic 11737x,1320 y
GCE	1099x,434y	Mosaic 11737x,1320 y
GCE	1099x,435y	Mosaic 11738x,1320 y
GCE	1078x,595y	Mosaic 11802x,1318 y
GCE	1027x,910y	Mosaic 11929x,1318 y
GCE	1024x,940y	Mosaic 11941x,1318 y
GCE	946x,1495y	Mosaic 12166x,1314 y
GCE	937x,1555y	Mosaic 12191x,1314 y
GCE	1081x,580y	Mosaic 11796x,1318 y
GCE	1081x,580y	Mosaic 11796x,1318 y



Original: DJI_0055.DNG (Larger Version)

1

GCE	1387x,376y	Mosaic 11919x,1315 y
GCE	1381x,355y	Mosaic 11911x,1319 y
GCE	1381x,356y	Mosaic 11912x,1319 y
GCE	1381x,357y	Mosaic 11912x,1318 y
GCE	1300x,901y	Mosaic 12123x,1317 y

Blade 1


Leading Edge

4



Damage Summary (19 total)

4	10	GCE
1	9	GCE

Feature Image	EPRI	Assessment Detail															
 <p>Original: DJI_0105.DNG (Larger Version)</p>	<p>1</p>	<table border="1"> <tr> <td>GCE</td> <td>1228x,1094y</td> <td>Mosaic 11575x,579y</td> </tr> <tr> <td>GCE</td> <td>1201x,1244y</td> <td>Mosaic 11666x,586y</td> </tr> <tr> <td>GCE</td> <td>1175x,1437y</td> <td>Mosaic 11750x,586y</td> </tr> <tr> <td>GCE</td> <td>1234x,1049y</td> <td>Mosaic 11529x,579y</td> </tr> <tr> <td>GCE</td> <td>1162x,1546y</td> <td>Mosaic 11796x,594y</td> </tr> </table>	GCE	1228x,1094y	Mosaic 11575x,579y	GCE	1201x,1244y	Mosaic 11666x,586y	GCE	1175x,1437y	Mosaic 11750x,586y	GCE	1234x,1049y	Mosaic 11529x,579y	GCE	1162x,1546y	Mosaic 11796x,594y
		GCE	1228x,1094y	Mosaic 11575x,579y													
		GCE	1201x,1244y	Mosaic 11666x,586y													
		GCE	1175x,1437y	Mosaic 11750x,586y													
		GCE	1234x,1049y	Mosaic 11529x,579y													
GCE	1162x,1546y	Mosaic 11796x,594y															



Original: DJI_0096.DNG (Larger Version)

1

GCE	1310x,1480y	Mosaic 9374x,579y
GCE	1287x,1635y	Mosaic 9420x,586y
GCE	1269x,1795y	Mosaic 9465x,586y



Original: DJI_0086.DNG (Larger Version)

1

GCE	1013x,1277y	Mosaic 6899x,564y
-----	-------------	----------------------



Original: DJI_0109.DNG (Larger Version)

4

GCE	1137x,1089y	Mosaic 12093x,594y
GCE	1152x,952y	Mosaic 11940x,579y
GCE	1175x,785y	Mosaic 11864x,586y
GCE	1279x,61y	Mosaic 11849x,594y
GCE	1274x,160y	Mosaic 11925x,586y
GCE	1241x,322y	Mosaic 11994x,602y
GCE	1162x,868y	Mosaic 11963x,602y
GCE	1185x,706y	Mosaic 12009x,617y
GCE	1203x,581y	Mosaic 11925x,586y



Shroyer Wind Farm

Asset Integrity Survey Services

Turbine **MW2 WTG-27**

	GCE	1047x,1645y	Mosaic 12359x,617y

Blade 1

Low Pressure

2



Damage Summary (7 total)

2	1	GCE
2	1	MissingVortexPanel
1	5	VortexDamage

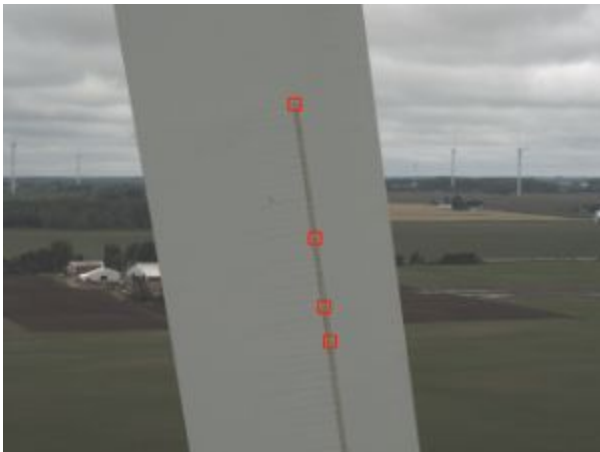
Feature Image	EPRI	Assessment Detail			
<p>Original: DJI_0145.DNG (Larger Version)</p>	1	<table border="1"> <tr> <td>VortexDamage</td> <td>1716x,1762y</td> <td>Mosaic 9450x,331y</td> </tr> </table>	VortexDamage	1716x,1762y	Mosaic 9450x,331y
VortexDamage	1716x,1762y	Mosaic 9450x,331y			



Original: DJI_0157.DNG (Larger Version)

2

MissingVortex Panel	1363x,1173y	Mosaic 12318x,308y
GCE	1480x,1582y	Mosaic 12472x,284y



Original: DJI_0143.DNG (Larger Version)

1

VortexDamage	1284x,442y	Mosaic 8512x,346y
VortexDamage	1373x,1031y	Mosaic 8766x,338y
VortexDamage	1414x,1333y	Mosaic 8958x,331y
VortexDamage	1439x,1485y	Mosaic 9019x,346y

Blade 1

Trailing Edge

0



There were no damages identified on this side of the blade.

There are no feature images with EPRI Code >= 1 on this side of the blade.

Blade 2


High Pressure

1



Damage Summary (3 total)

1	1	Anomaly
1	1	GCE
1	1	Pitting

Feature Image	EPRI	Assessment Detail			
 <p>Original: DJI_0038.DNG (Larger Version)</p>	<p>1</p>	<table border="1"> <tr> <td>Pitting</td> <td>833x,399y</td> <td>Mosaic 8078x,1243y</td> </tr> </table>	Pitting	833x,399y	Mosaic 8078x,1243y
Pitting	833x,399y	Mosaic 8078x,1243y			



1

Anomaly	1183x,515y	Mosaic 1183x,515y
GCE	992x,673y	Mosaic 12101x,1359 y

Original: DJI_0052.DNG (Larger Version)

Blade 2

Leading Edge



2



Damage Summary (4 total)

2	3	GCE
1	1	GCE

Feature Image	EPRI	Assessment Detail
-------------------------------	----------------------	-----------------------------------

	<p>1</p>	<table border="1"> <tr> <td>GCE</td> <td>1420x,1453y</td> <td>Mosaic 11654x,240y</td> </tr> </table>	GCE	1420x,1453y	Mosaic 11654x,240y						
GCE	1420x,1453y	Mosaic 11654x,240y									
	<p>2</p>	<table border="1"> <tr> <td>GCE</td> <td>1103x,1738y</td> <td>Mosaic 12228x,228y</td> </tr> <tr> <td>GCE</td> <td>1273x,575y</td> <td>Mosaic 12084x,236y</td> </tr> <tr> <td>GCE</td> <td>1262x,620y</td> <td>Mosaic 12100x,220y</td> </tr> </table>	GCE	1103x,1738y	Mosaic 12228x,228y	GCE	1273x,575y	Mosaic 12084x,236y	GCE	1262x,620y	Mosaic 12100x,220y
GCE	1103x,1738y	Mosaic 12228x,228y									
GCE	1273x,575y	Mosaic 12084x,236y									
GCE	1262x,620y	Mosaic 12100x,220y									

Original: DJI_0047.DNG (Larger Version)

Original: DJI_0051.DNG (Larger Version)

Blade 2


Low Pressure

2



Damage Summary (4 total)

<p>2</p>	<p>2</p>	<p>GCE</p>
<p>2</p>	<p>2</p>	<p>MissingVortexPanel</p>

Feature Image	EPRI	Assessment Detail	
	2	MissingVortex Panel	1100x,1222y Mosaic 12399x,136y
		MissingVortex Panel	1108x,1322y Mosaic 12359x,128y
		GCE	1220x,1659y Mosaic 12391x,108y
		GCE	1222x,1728y Mosaic 12435x,116y

Original: DJI_0064.DNG (Larger Version)

Blade 2

Trailing Edge

0



There were no damages identified on this side of the blade.

There are no feature images with EPRI Code >= 1 on this side of the blade.

Blade 3

High Pressure

0



There were no damages identified on this side of the blade.

There are no feature images with EPRI Code >= 1 on this side of the blade.

Blade 3

Leading Edge

1



Damage Summary (3 total)

1	3	GCE
---	---	-----

Feature Image	EPRI	Assessment Detail			
<p>Original: DJI_0115.DNG (Larger Version)</p>	1	<table border="1"> <tr> <td>GCE</td> <td>1609x,592y</td> <td>Mosaic 11810x,287y</td> </tr> </table>	GCE	1609x,592y	Mosaic 11810x,287y
GCE	1609x,592y	Mosaic 11810x,287y			



1

GCE	1300x,1826y	Mosaic 12166x,299y
GCE	1327x,1661y	Mosaic 12082x,299y

Original: DJI_0116.DNG (Larger Version)

Blade 3

Low Pressure

2



Damage Summary (7 total)

2	4	GCE
2	3	MissingVortexPanel

Feature Image

EPRI


Assessment Detail



2

MissingVortex Panel	1300x,609y	Mosaic 11803x,116y
------------------------	------------	-----------------------

Original: DJI_0179.DNG (Larger Version)



Original: DJI_0183.DNG (Larger Version)

MissingVortex Panel	1305x,1171y	Mosaic 12375x,84y
MissingVortex Panel	1315x,1267y	Mosaic 12407x,84y
GCE	1401x,1628y	Mosaic 12491x,76y
GCE	1409x,1498y	Mosaic 12459x,68y
GCE	1411x,1412y	Mosaic 12383x,52y
GCE	1399x,1259y	Mosaic 12315x,68y

2

Blade 3

Trailing Edge

0



There were no damages identified on this side of the blade.

There are no feature images with EPRI Code >= 1 on this side of the blade.