



MECH-V

Wind Turbine Blade Inspection Report

UAV/SUA Aerial Inspection

Report Number: MECHV_REP-200-672-1

Report Date: 06/10/2020

Client: DJN Renewables
Location: Curraghderrig Wind Farm, Co. Kerry
Asset: Turbine T02 - Enercon E70 E4 2300 - Serial# 156345

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General Information

Client

Name	DJN Renewables
Address	Curraghderrig, Co. Kerry
Contact Person	Michael Lawson

Inspection Scope

Objective	Drone inspection of wind turbine rotor blades for condition assessment and damage classification based on visual observations.
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Inspection Details

Inspection Date	05/10/2020
Time of Inspection	10:00 – 11:15
Environment	16 °C Dry with light cloud
Inspector / Pilot	Robert Foley
Report Author	Robert Foley
Report Checked	Stephen O’Keeffe
Report Number	MECHV_REP-200-672-1
Support	Brett McLoughlin (Technician)

Asset Details

Asset	Turbine T02
Model	Enercon E70 E4 2300
Rated Power	2300 kW
Asset Serial #	156345
Commission Year	2016
Production/Run Hrs	13502 hrs 10830 MWh
Tower Type	Steel Tubular
Hub Height	68m
Location	Curraghderrig, Co. Kerry (52.554778, -9.595614)

Blade Details

Blade Set	0452
Blade Serial #'s	Blade A: 5267 Blade B: 5268 Blade C: 5266
Manufacturer / Type	Enercon E70/4
Length	40.8m
No. of Lightning Receptors	2 per blade
Leading Edge Protection	Foil Tape
Aerodynamic Installations	Vortex Generators



Damage Classification

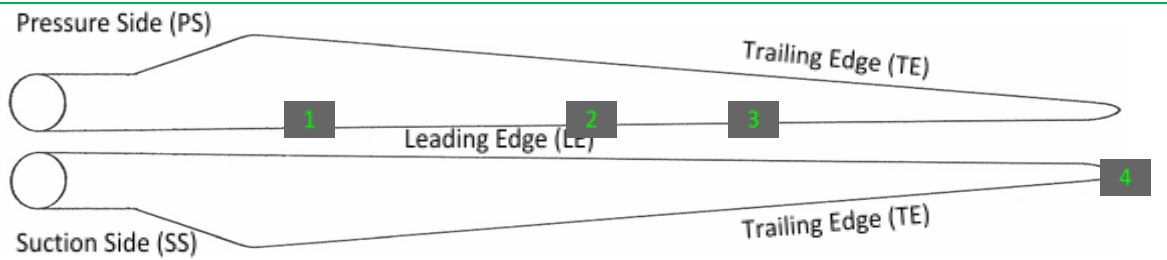
CAT	Description	Description of Damage	Recommended Action
1	Cosmetic	Mild contamination, scratches etc. No intervention required.	No Action
2	Superficial	Minor damages to gel coat, small cracks, early stages of LE erosion and general wear. Intervene only if completing other repairs.	No Action. Monitor at next inspection
3	Functional	Damages deemed likely to impact on performance or to progress if not repaired in a suitable time frame. Debonding of leading-edge tape, leading edge erosion, minor laminate exposures, progressing gel coat damages, non-critical surface cracks. Intervention recommended to mitigate damage progression.	Repair within 6 months. Monitor every 3 months
4	Severe	Progressed damages of a more severe nature (Large laminate exposures, tip damage, open trailing or leading edge, debonding or progressed cracking).	Blade <u>must</u> be repaired within 3 months. Monitor monthly.
5	Very Severe Structural	Severe damages. Structural integrity of the blade is at risk. Immediate intervention required.	<u>Stop</u> turbine and undertake immediate repair action.

Report Summary

Overall the blade condition on T02 was found to be in good order. Some minor leading-edge erosion, oil contamination at one of the blade tips and minor handling damage. No significant damages were observed. The hub and the tower interface flange were also inspected and only minor paint damages noted.

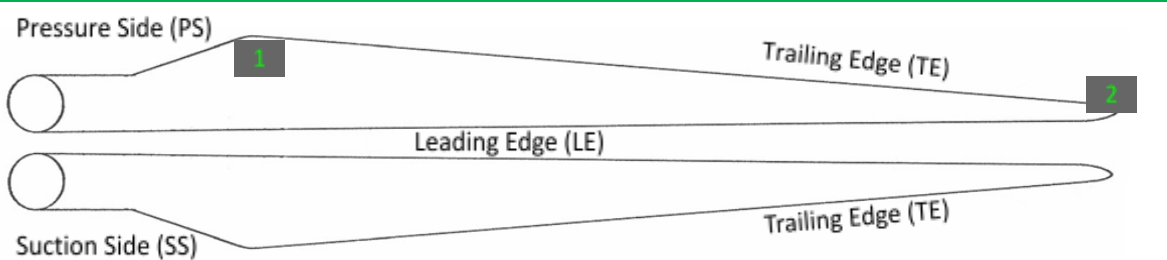


Findings – Overview

Blade A
Serial# 5267

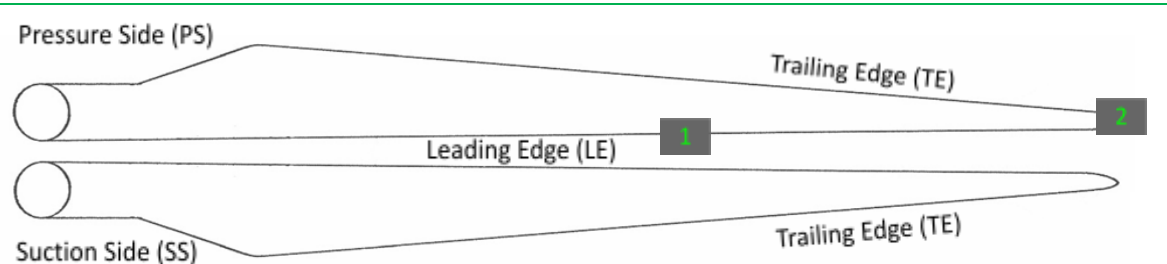
REF	Description	CAT
1	Small scratch in paint on LE	2
2	LE Erosion	2
3	Gouge in gelcoat. Construction/transport damage	3
4	Oil contamination at tip seeping from drain hole.	2
5		
6		
7		

REF	Description	CAT
8		
9		
10		
11		
12		
13		
14		

Blade B
Serial# 5268

REF	Description	CAT
1	Gel coat cracking	2
2	Small chip in gel coat at TE near tip	2
3		
4		
5		
6		
7		

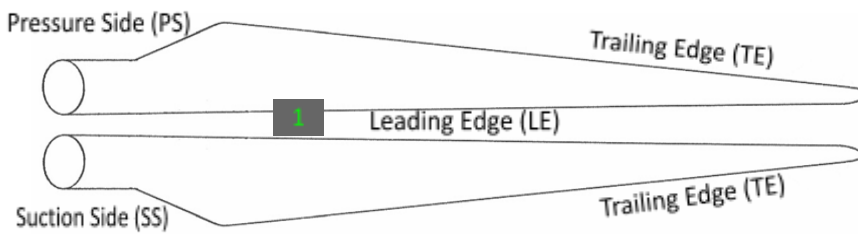
REF	Description	CAT
8		
9		
10		
11		
12		
13		
14		

Blade C
Serial# 5266

REF	Description	CAT
1	Minor LE Erosion. Isolated small patch.	2
2	LE Erosion at tip.	2
3		
4		
5		
6		
7		

REF	Description	CAT
8		
9		
10		
11		
12		
13		
14		

Findings – Individual

		REF #	1
		Damage Class - CAT	1
		Damage - Type	Handling
		Distance from Root	8m
		<input checked="" type="checkbox"/> LE <input type="checkbox"/> TE <input type="checkbox"/> PS <input type="checkbox"/> SS	
Comment	Small scratch in paint on LE	Blade	A
Recommendation	n/a	Serial#	5267
		Image Ref	DJI_0489

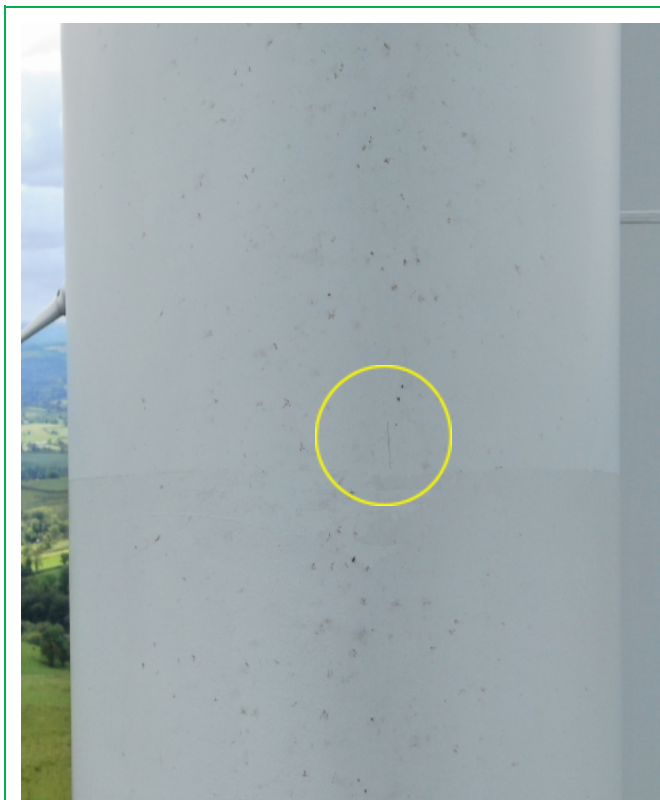


IMAGE 1



IMAGE 2

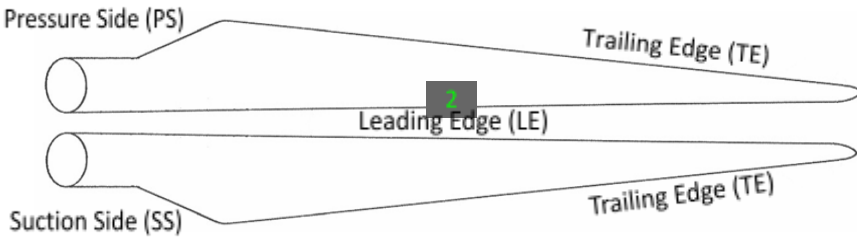
		REF #		2	
		Damage Class - CAT		2	
		Damage - Type		Wear	
		Distance from Root		21m	
		<input checked="" type="checkbox"/> LE <input type="checkbox"/> TE <input type="checkbox"/> PS <input type="checkbox"/> SS			
Comment	LE Erosion	Blade	A	Serial#	5267
Recommendation	n/a	Image Ref		DJI_0512	



IMAGE 1

Wind Turbine Blade Inspection Report

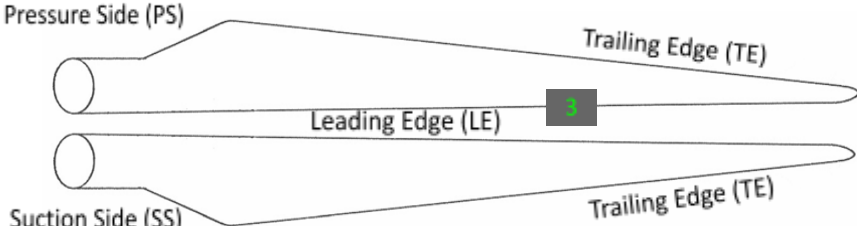
		REF #		3	
		Damage Class - CAT		3	
		Damage - Type		Handling	
		Distance from Root		30m	
		<input checked="" type="checkbox"/> LE <input type="checkbox"/> TE <input type="checkbox"/> PS <input type="checkbox"/> SS			
Comment	Gouge in gelcoat. Construction/transport damage	Blade	A	Serial#	5267
Recommendation	n/a	Image Ref		DJI_0467	



IMAGE 1



IMAGE 2

Wind Turbine Blade Inspection Report

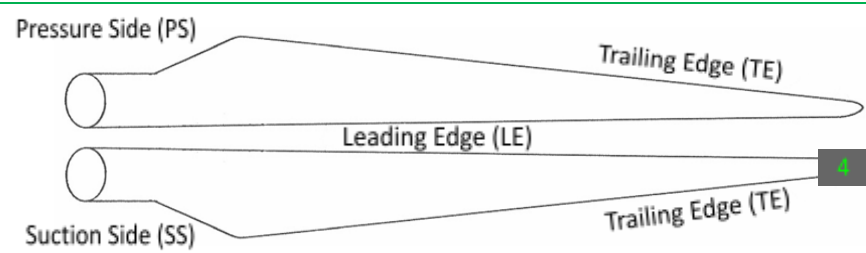
		REF #		4	
		Damage Class - CAT		2	
		Damage - Type		Contamination	
		Distance from Root		40m	
		<input type="checkbox"/> LE <input type="checkbox"/> TE <input type="checkbox"/> PS <input checked="" type="checkbox"/> SS			
Comment	Oil contamination at tip seeping from drain hole.	Blade	A	Serial#	5267
Recommendation	n/a	Image Ref		DJI_0558	



IMAGE 1

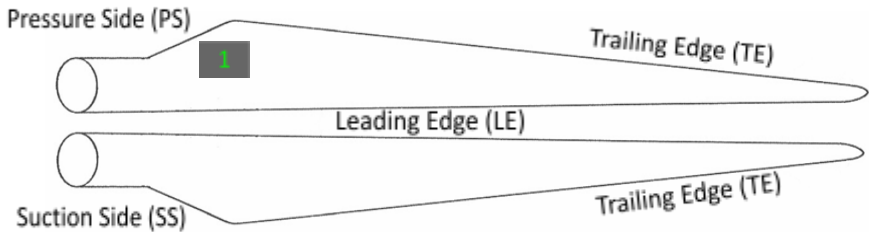
		REF #		1	
		Damage Class - CAT		2	
		Damage - Type		Damage	
		Distance from Root		4m	
		<input type="checkbox"/> LE <input type="checkbox"/> TE <input checked="" type="checkbox"/> PS <input type="checkbox"/> SS			
Comment	Gel coat cracking	Blade	B	Serial#	5268
Recommendation	Monitor at next inspection	Image Ref		DJI_0582	



IMAGE 1



IMAGE 2

Wind Turbine Blade Inspection Report

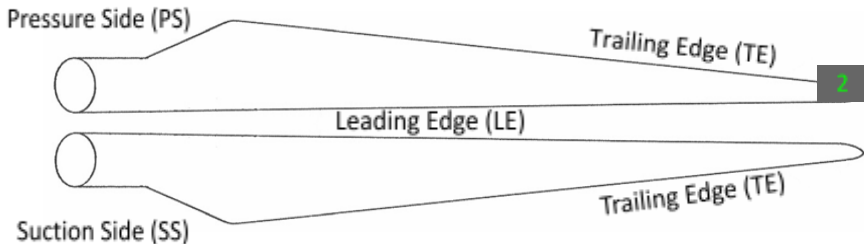
		REF #	2		
		Damage Class - CAT	2		
		Damage - Type	Damage		
		Distance from Root	40m		
		<input type="checkbox"/> LE <input checked="" type="checkbox"/> TE <input type="checkbox"/> PS <input type="checkbox"/> SS			
Comment	Small chip in gel coat at TE near tip	Blade	B	Serial#	5268
Recommendation	n/a	Image Ref		DJI_0641	



IMAGE 1

Wind Turbine Blade Inspection Report

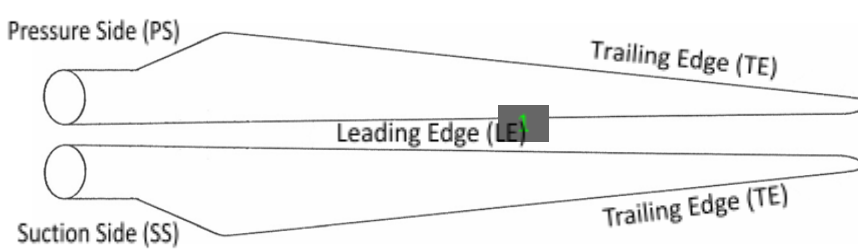
		REF #		1	
		Damage Class - CAT		2	
		Damage - Type		Wear	
		Distance from Root		25m	
		<input checked="" type="checkbox"/> LE <input type="checkbox"/> TE <input type="checkbox"/> PS <input type="checkbox"/> SS			
Comment	Minor LE Erosion. Isolated small patch.	Blade	C	Serial#	5266
Recommendation	n/a	Image Ref		DJI_0745	



IMAGE 1

Wind Turbine Blade Inspection Report

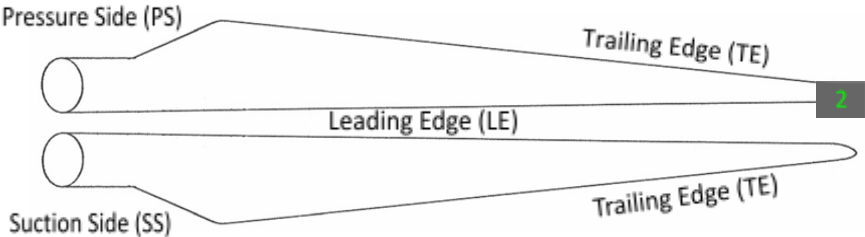
		REF #		2	
		Damage Class - CAT		2	
		Damage - Type		Wear	
		Distance from Root		40.8m	
		<input checked="" type="checkbox"/> LE		<input type="checkbox"/> TE	<input type="checkbox"/> PS
Comment	LE Erosion at tip.	Blade	C	Serial#	5266
Recommendation	n/a	Image Ref		DJI_0798	



IMAGE 1



IMAGE 2

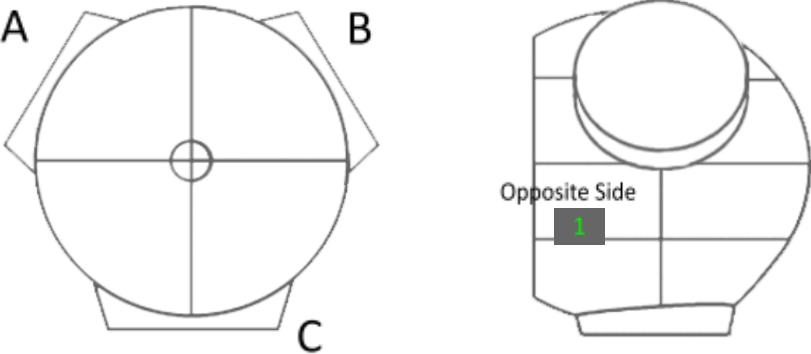
		REF #	1
		Damage Class - CAT	2
		Damage - Type	Cosmetic
		Distance from Root	n/a
Comment	Paint damage on hub exterior	Location	Hub
Recommendation	n/a	Image Ref	n/a



IMAGE 1



IMAGE 2

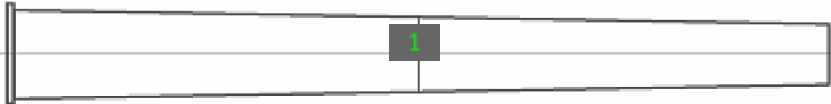
		REF #	1
		Damage Class - CAT	2
		Damage - Type	Cosmetic
		Distance from Root	n/a
Comment	Minor corrosion on tower joint	Location	Tower
Recommendation	No structural risk. Corrosion is coming from an area of flaked paintwork.	Image Ref	n/a



IMAGE 1 – General Condition



IMAGE 2 – Close up of yellow marked area

END REPORT