“Maunawili”

Underwater Propeller Inspection

Berth C62
Long Beach Harbor, California

April 20, 2015

Matson Navigation Company
1521 Pier C Street
Long Beach, CA 90813

M U L D O O N M A R I N E S E R V I C E S, I N C.
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Tel +1 562 432-5670 Fax +1 562 432-6623
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UNDERWATER SERVICE REPORT

GENERAL DETAILS

Vessel: "Maunawili" Date: April 20, 2015

Location: Long Beach, CA Berth C62 Draft: Aft: 7M

Sea State: Calm Visibility: 10' Current: -0-

UNDERWATER ASSIGNMENT

Hull Cleaning: Yes [ ] No [X] Propeller Polishing: Yes [ ] No [X]

Others: Class IWS/CCTV [ ] Visual Survey With Photos [X] Others/Repair [ ]

PROPELLER

No. Of Blades: 6

Type: Single [X] Twin [ ]

UNDERWATER SERVICE REPORT:

PROPELLER

Blade Condition Good [X] Fair [ ] Poor [ ]

Bolting Assembly Intact Yes [ ] No [ ] Na [X]

DESCRIPTION

Pittings	Yes		No	X	
Cavitation / Erosion	Yes	X	No		
Tears	Yes		No	X	
Cracks	Yes		No	X	
Deflection/ Scouring	Yes		No	X	
Previous Repairs	Yes	X	No		
Any Oil Leaking From Blade Seal	Yes		No	X	Na

Remarks:

The propeller is coated with Coverall clear coating.

Minor cavitation was observed on the 0.9 radius near the tips of all six blades, this cavitation was coated during the last dry docking. The coating on and around the areas of cavitation did not appear to be damaged. However, it was very difficult to determine the coating condition on cavitated areas due to the difference in texture caused by the cavitation.

The previous grinding repair observed on blade D was still holding. The repair was coated over and both the coating are repair were in good condition.

All blades are fouled with light slime on leading and trailing edge. Sporadic tube worms were observed on the pressure face and suction back. The diver wiped the inner radii of the propeller surfaces clean in order to allow us to have an accurate measure of fouling.

Overall surface roughness appears to be a “B”. The clear coating changes the appearance of the propeller surface and makes it smoother to the touch than an uncoated propeller. Due to this fact the surface does not correlate exactly with the facsimile representations on the Rubert Propeller Roughness Gauge.

Some areas near the .4 radius appeared to have been missed during the coating process; these uncoated areas were approximately two grades rougher than the coated surfaces. See photos page M and N.

FAIR WATER CAP

Condition	Good	X	Defective		
Cement Covers	Intact		Missing		Na X
Bolting Assembly	Intact	X	Missing		Covered

PROPELLER SHAFT

Any Oil Leaking From Shaft	Yes		No	X
Any Damage To Tailshaft Assembly	Yes		No	X
Any Entanglement On Shaft	Yes		No	X
If Yes, Has It Been Removed	Yes		No	

PROPELLER CONDITION REMARKS

Blade #A: Cavitation on .9 radius 2.5 inches in length, see photos pages B and C. Coating is in good condition.

Blade #B: Cavitation on .9 radius 2 inches in length, see photos page D. Coating is in good condition.

Blade #C: Cavitation on .9 radius 1.5 inches in length, page F and G. Coating is in good condition.

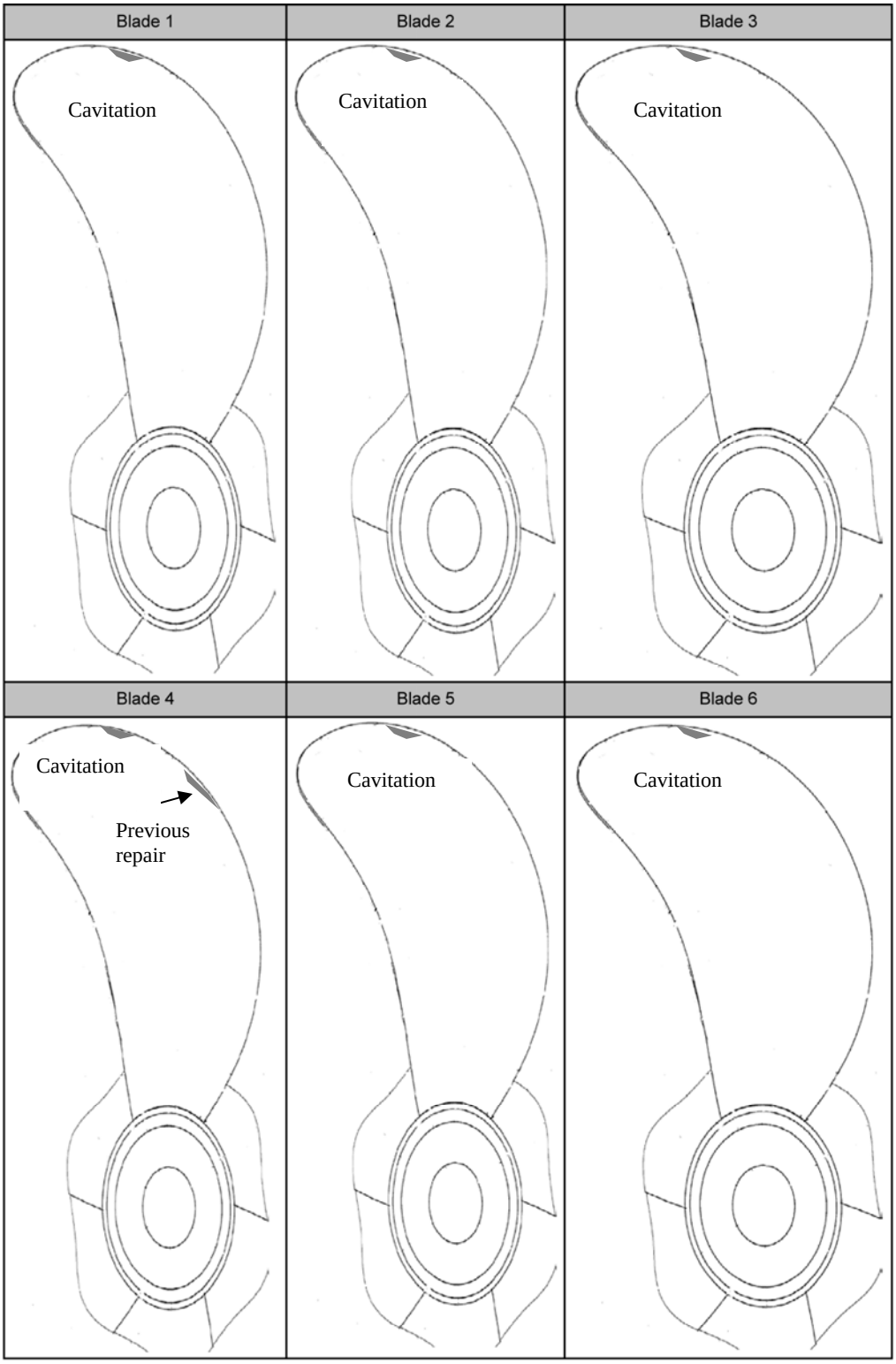
Blade #D: Cavitation on .9 radius 2 inches in length, see photos pages H and I. Coating is in good shape. A previous grinding repair was observed was still holding, see photos page I. The repair was coated over.

Blade #E: Cavitation on .9 radius 4 inches in length, See photos page K. Coating is in good shape.

Blade #F: Cavitation on .9 radius 3.5 inches in length, see photo page M. Coating is in good shape.

See diagram page 5

PROPELLER DIAGRAM SHEET



ROPE GUARD COVER

Condition	Good	X	Defective					
Type	Welded	X	Bolted		Access Hole Top	X	Bottom	X
Are Cutters Intact	Yes	X	No		Na			
Erosion/ Corrosion	Yes		No	X				

RUDDER

Rudder Horn Any Visible Damage	Yes		No	X				
Rudder Stock Any Visible Damage	Yes		No	X				
Plate Condition	Good	X	Satisfactory		Poor		Damage	
Any Visible Cracks	Yes / Indicated In Drawing		No	X				
Rudder Plug Nos.: 1___	Intact	X	Not Intact					
Rudder Pintle Clearance Taken	Yes		No	X	Na			

Remarks: Previous repair observed on rudder flat bottom by leading edge. Repair is in good condition. One anode was missing and the remaining anodes are 40% wasted.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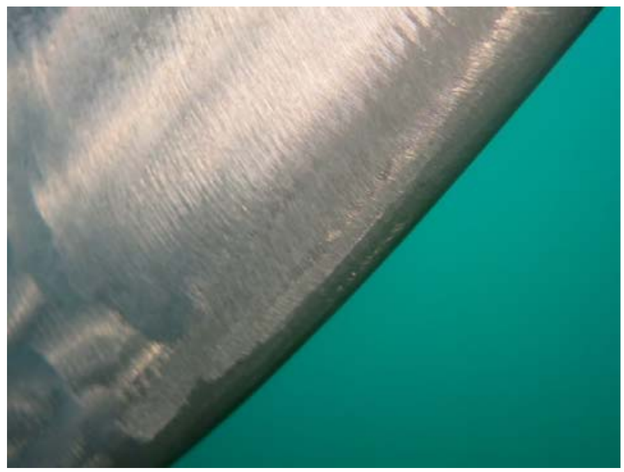
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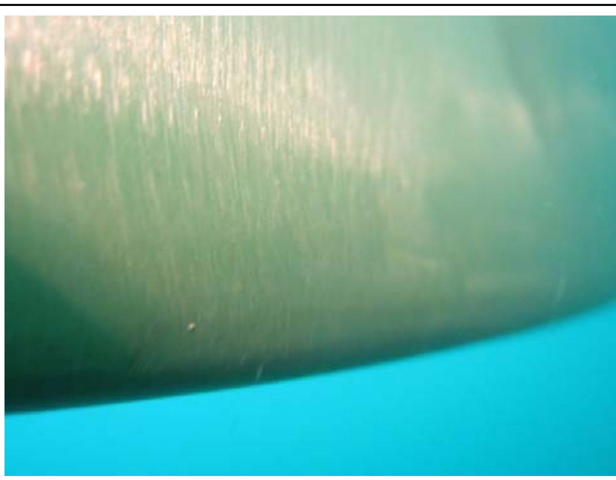
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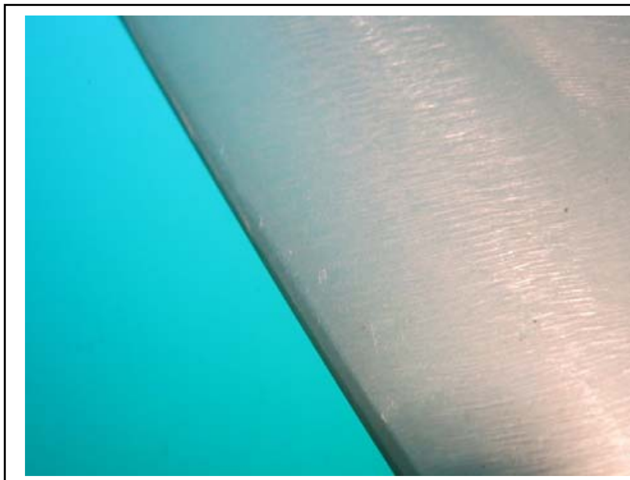
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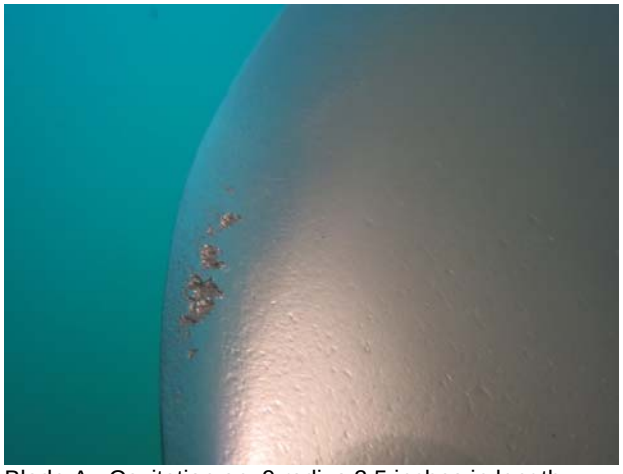
Blade A: Cavitation on .9 radius 2.5 inches in length. Surfaces around the cavitation damage appeared to still have intact coating.



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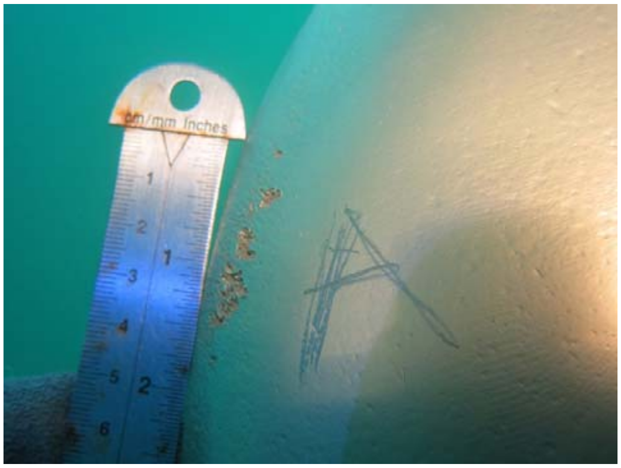
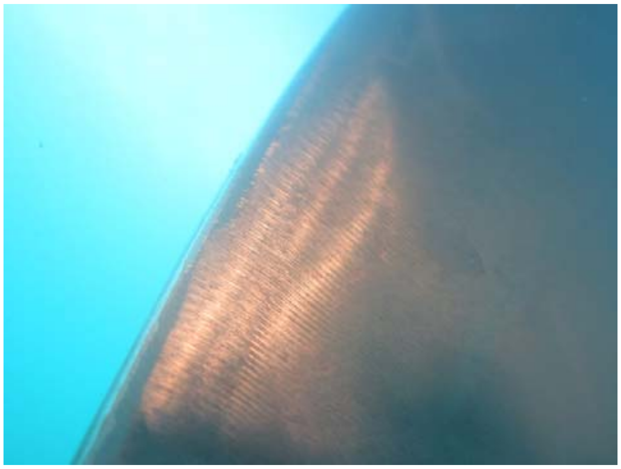


Blade A: Cavitation on .9 radius 2.5 inches in length. Surfaces around the cavitation damage appeared to still have intact coating.


Blade B: fouled with light slime on leading and trailing edge. Tube worms were observed on the pressure face and suction back. Coating in good condition overall.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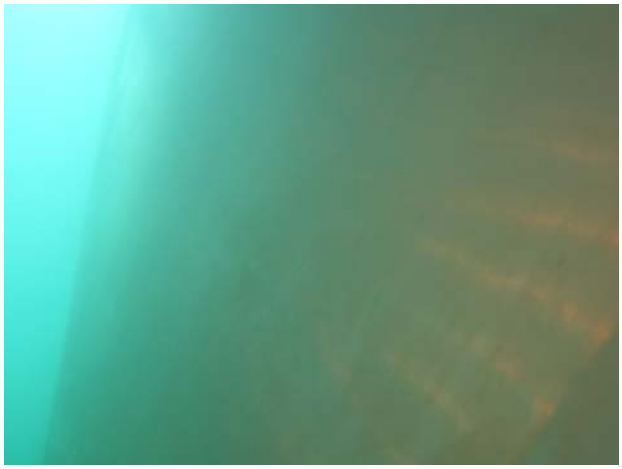

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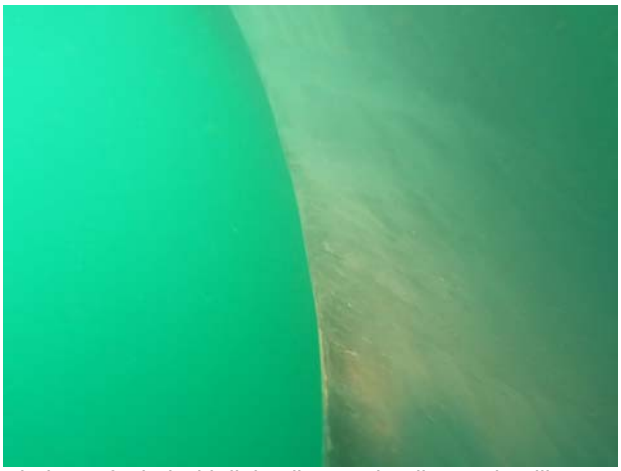

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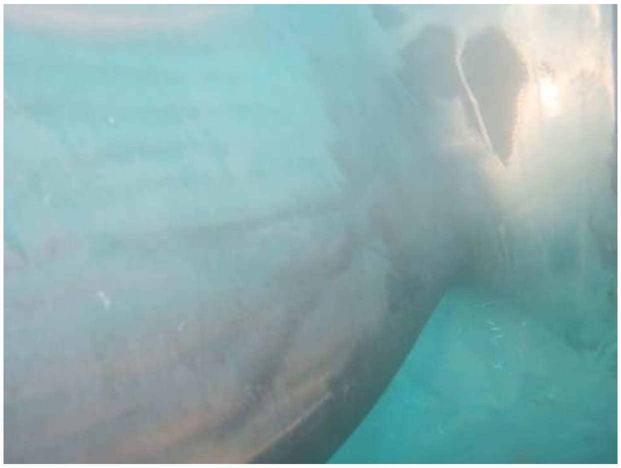

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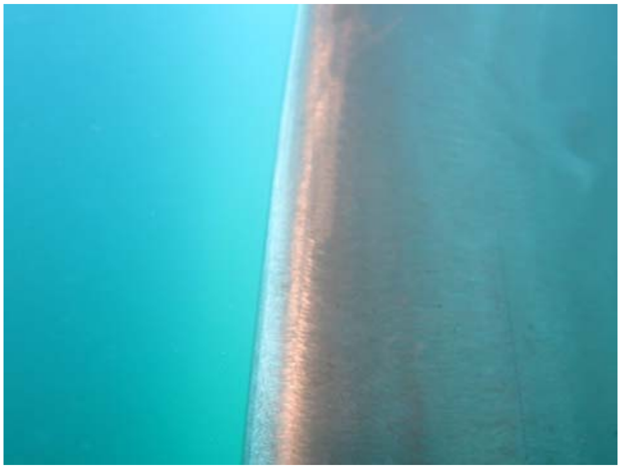

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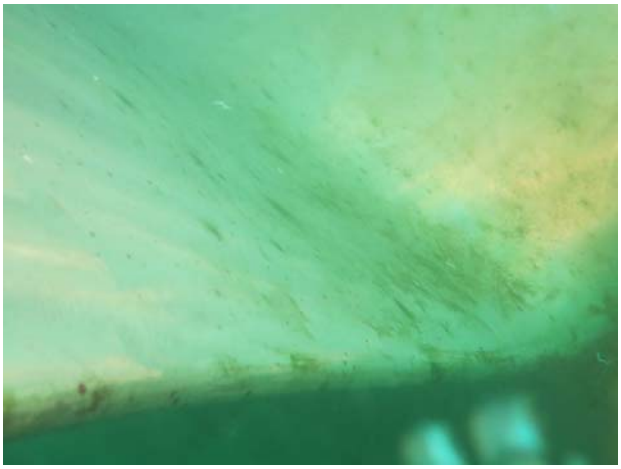

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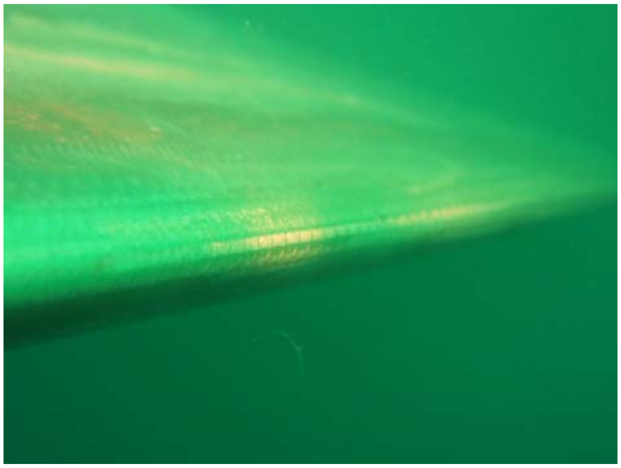
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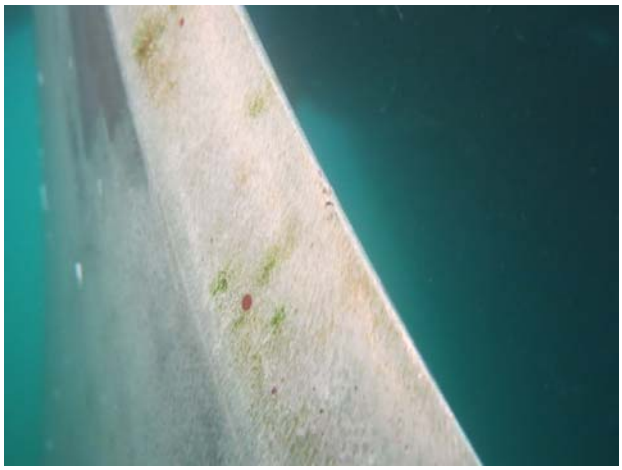

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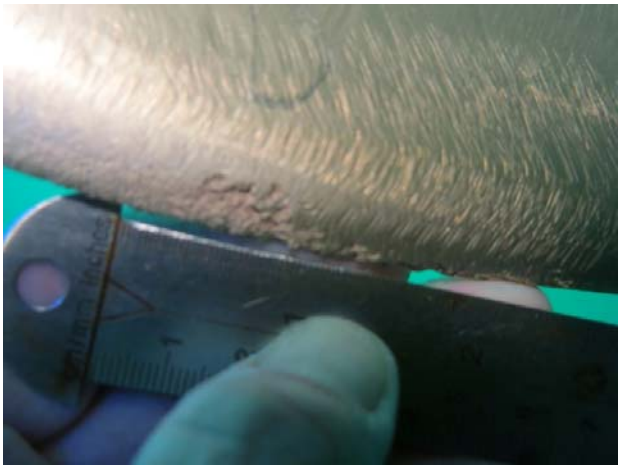

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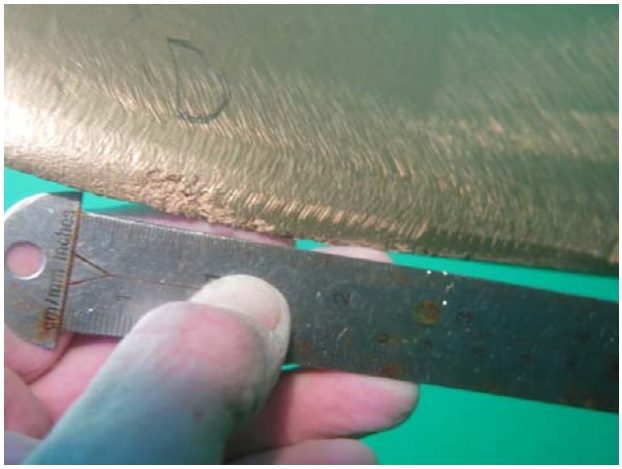

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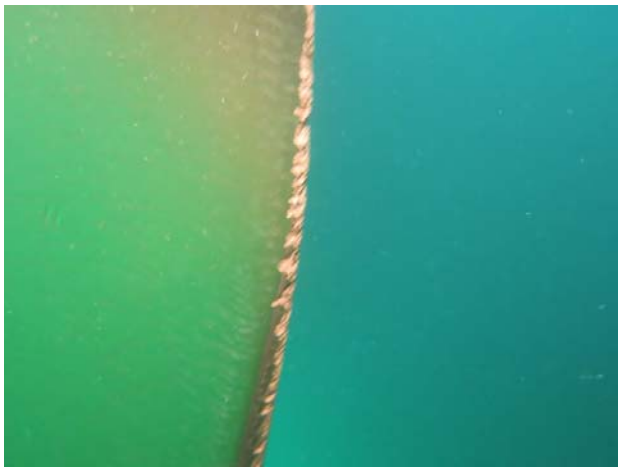

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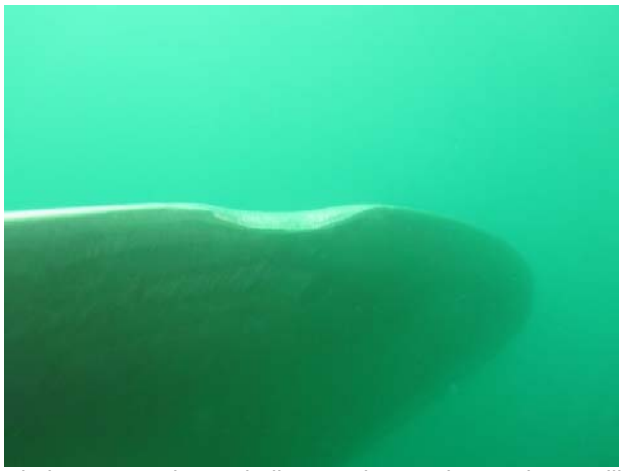

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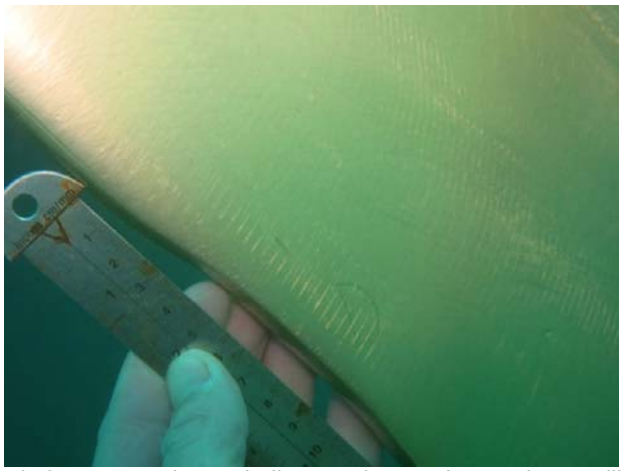

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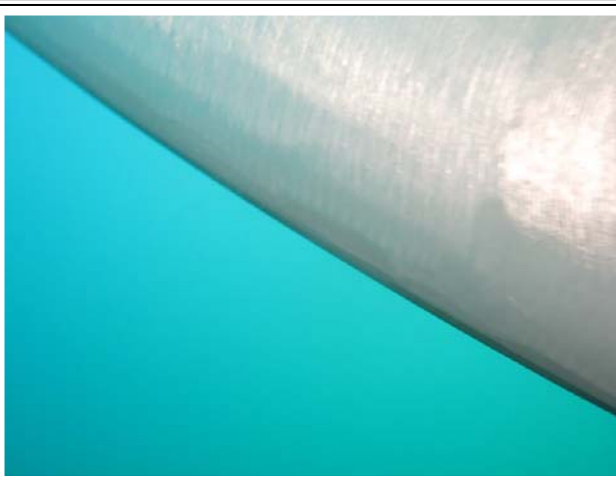

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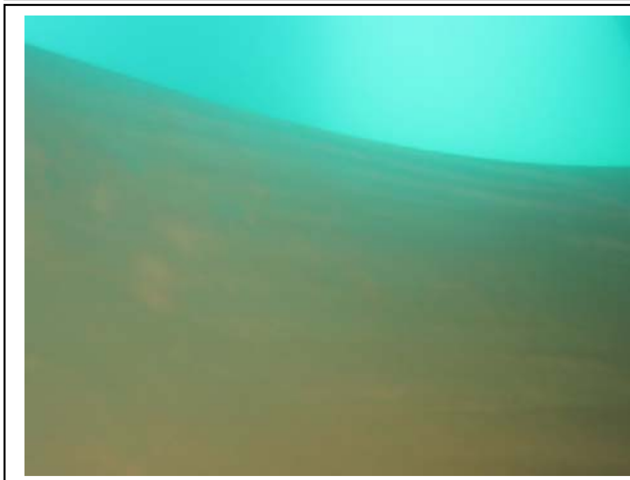

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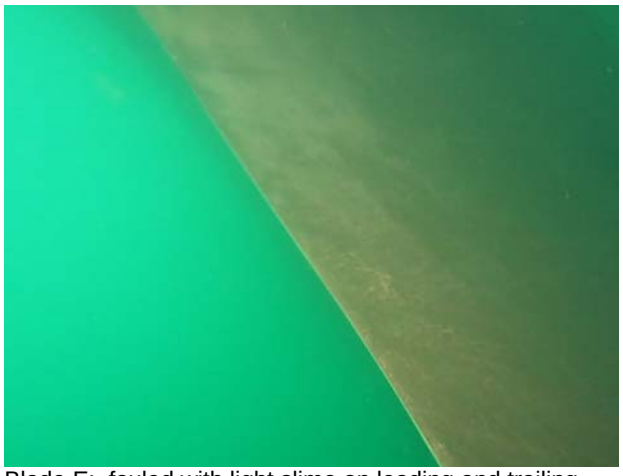

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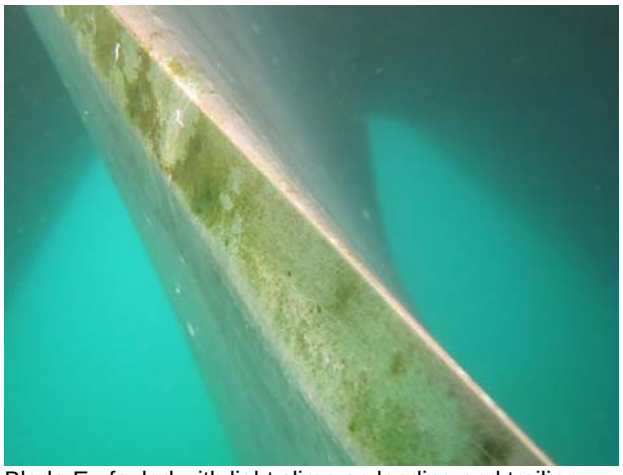

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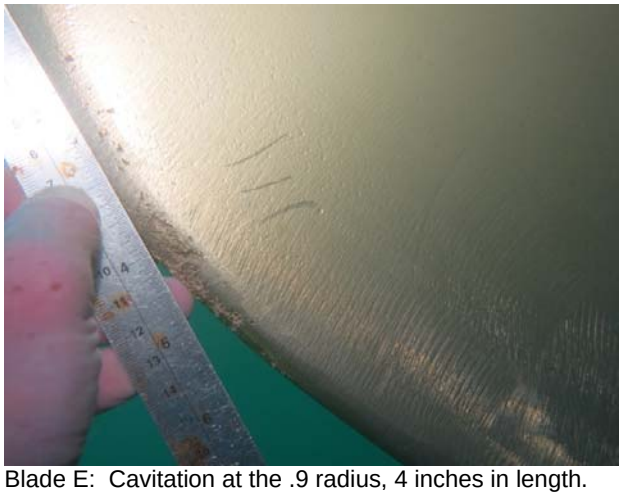
Blade E: Cavitation at the .9 radius, 4 inches in length. Surfaces around the cavitation damage appeared to still have intact coating.



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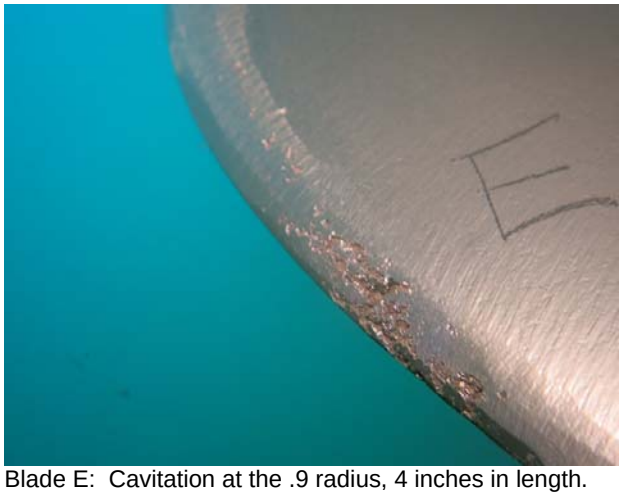

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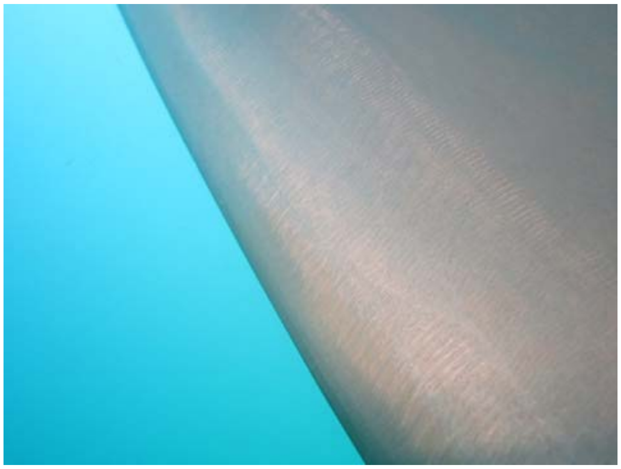
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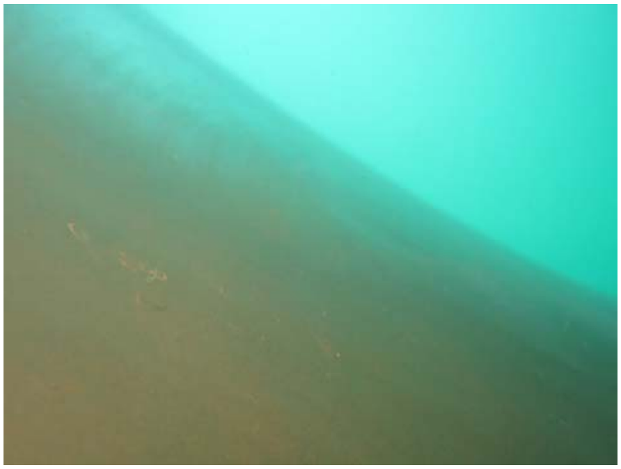
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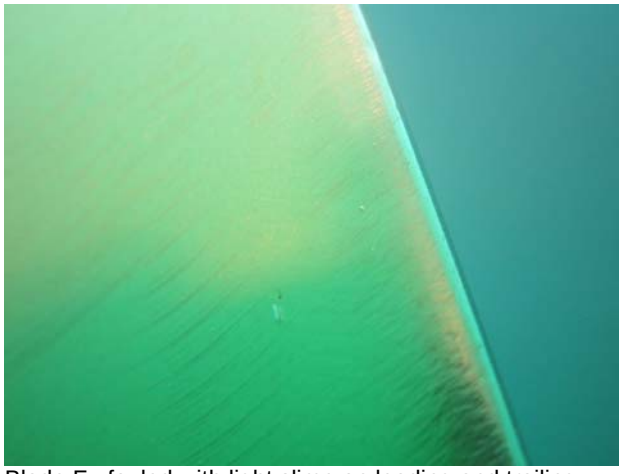

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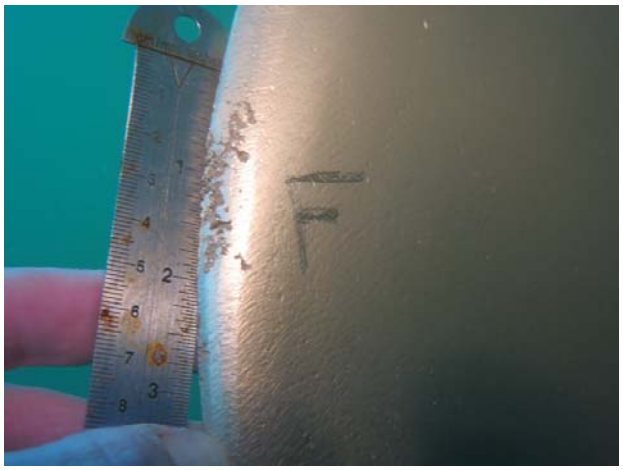
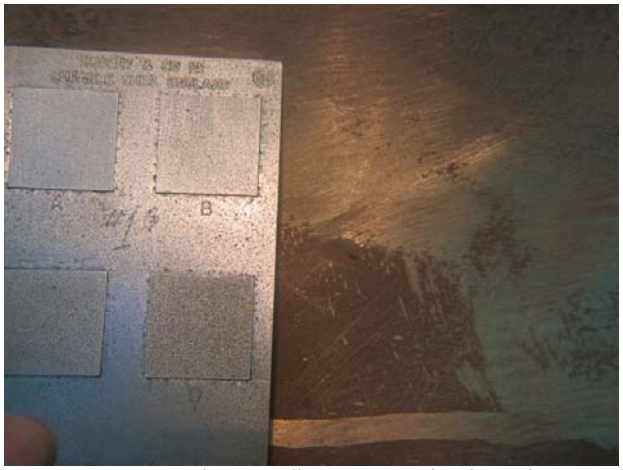
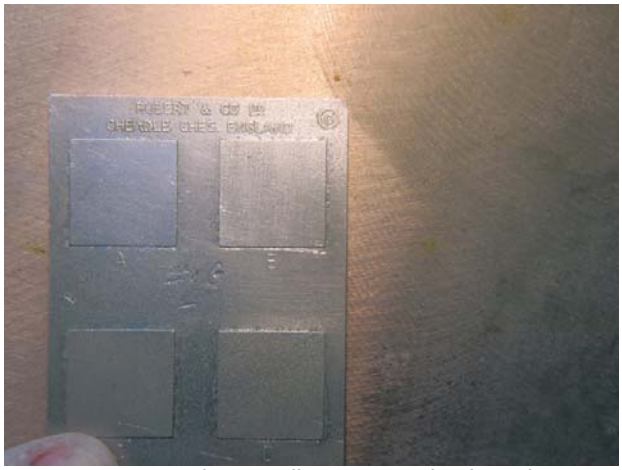


Blade F: Cavitation at the .9 radius, 3.5 inches in length.

A removable plug on the propeller was intact. Minor coating loss around the plug.



Some areas near the .4 radius appeared to have been missed during the coating process; these uncoated areas were approximately two grades rougher than the coated surfaces.



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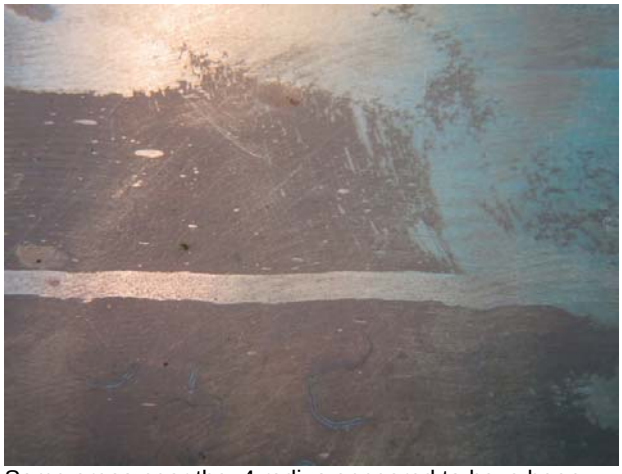

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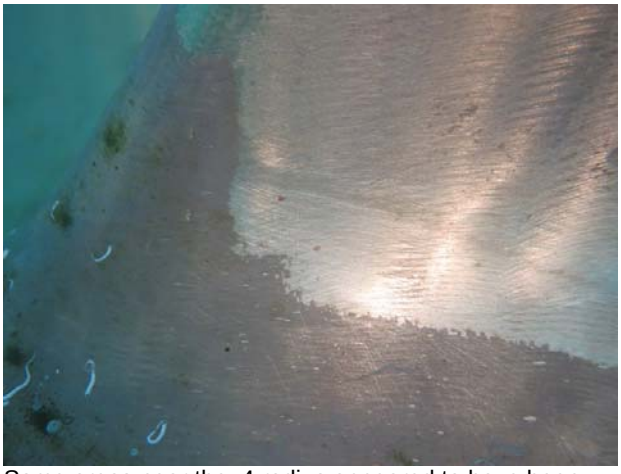

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