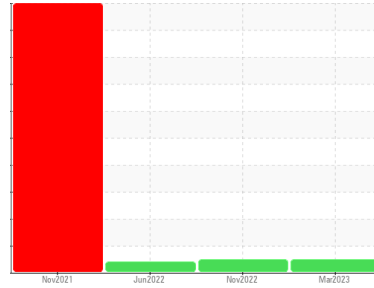




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id
WESTINGHOUSE 501D

Component
Turbine
Fluid

PETRO CANADA TURBOFLO XL32 (4250 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: THIS AOM3 TEST AFTER ADDITION OF NEW OIL 1/2 VOLUME AND FILTER CHANGE 08/22. LAST IND2 TEST SHOWED POSITIVE RESULTS.)

Wear

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.

Contaminants

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable.

Oil Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0755036	WC0751390	WC0711963
Sample Date	Client Info		03 Mar 2023	16 Nov 2022	15 Jun 2022
Machine Age	yrs	Client Info	30	0	0
Oil Age	yrs	Client Info	10	10	0
Oil Changed	Client Info		Filtered	Not Changd	N/A
Sample Status			NORMAL	NORMAL	MARGINAL

WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184*		0	---	0
Iron	ppm	ASTM D5185(m) >15	0	0	0
Chromium	ppm	ASTM D5185(m) >4	0	0	0
Nickel	ppm	ASTM D5185(m) >2	0	0	0
Titanium	ppm	ASTM D5185(m)	0	0	0
Silver	ppm	ASTM D5185(m)	0	0	0
Aluminum	ppm	ASTM D5185(m) >10	0	<1	0
Lead	ppm	ASTM D5185(m)	0	0	0
Copper	ppm	ASTM D5185(m) >5	<1	<1	<1
Tin	ppm	ASTM D5185(m) >5	0	<1	<1
Antimony	ppm	ASTM D5185(m)	<1	<1	0
Vanadium	ppm	ASTM D5185(m)	0	0	0
Beryllium	ppm	ASTM D5185(m)	0	0	0
Cadmium	ppm	ASTM D5185(m)	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m) 0	<1	<1	<1
Barium	ppm	ASTM D5185(m) 0	0	0	0
Molybdenum	ppm	ASTM D5185(m) 0	0	0	0
Manganese	ppm	ASTM D5185(m) 0	0	0	0
Magnesium	ppm	ASTM D5185(m) 0	0	0	0
Calcium	ppm	ASTM D5185(m) 0	0	0	0
Phosphorus	ppm	ASTM D5185(m) 5	90	89	87
Zinc	ppm	ASTM D5185(m) 0	<1	<1	<1
Sulfur	ppm	ASTM D5185(m) 750	172	199	165
Lithium	ppm	ASTM D5185(m)	<1	<1	<1

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m) >15	0	<1	<1
Sodium	ppm	ASTM D5185(m)	0	0	0
Potassium	ppm	ASTM D5185(m) >20	<1	<1	0
Water	%	ASTM D6304* >0.03	0.001	0.001	0.001
ppm Water	ppm	ASTM D6304* >300	2.3	5.9	3.7

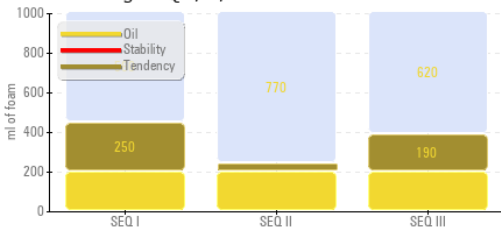
INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	ASTM D7844*	0	---	0
Nitration	Abs/cm	ASTM D7624*	2.0	---	2.0
Sulfation	Abs./1mm	ASTM D7415*	12.6	---	12.9

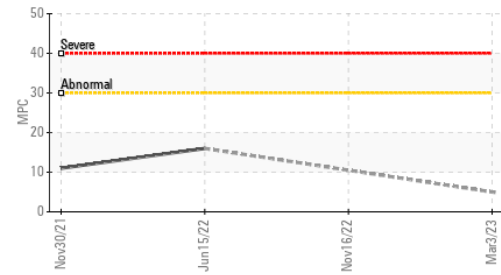


OIL ANALYSIS REPORT

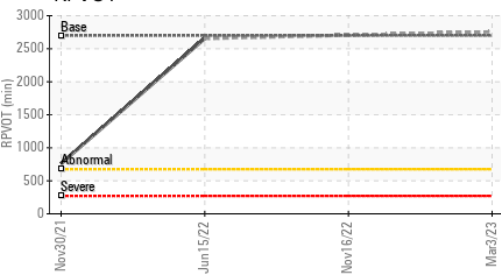
Foaming SEQ I/II/III



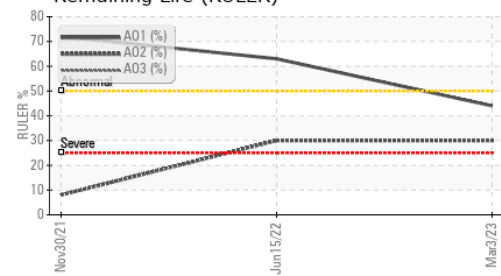
Varnish Potential



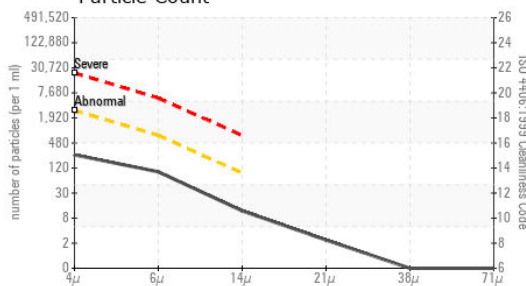
RPVOT



Remaining Life (RULER)



Particle Count



FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>2500	219	428	799
Particles >6µm	ASTM D7647	>640	86	121	183
Particles >14µm	ASTM D7647	>80	10	9	14
Particles >21µm	ASTM D7647	>20	2	2	3
Particles >38µm	ASTM D7647	>4	0	0	0
Particles >71µm	ASTM D7647	>3	0	0	0
Oil Cleanliness	ISO 4406 (c)	>18/16/13	15/14/10	16/14/10	17/15/11

FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs./1mm	ASTM D7414*	2.6	---	2.6
Acid Number (AN)	mg KOH/g	ASTM D974*	0.05	0.04	0.07
Anti-Oxidant 1	%	ASTM D6971*	44	---	63
Anti-Oxidant 2	%	ASTM D6971*	30	---	30
MPC Varnish Potential	Scale	ASTM D7843(m)*	5	---	▲ 16

VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE
Precipitate	scalar	Visual*	NONE	NONE	NONE
Silt	scalar	Visual*	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	NORML	NORML
Odor	scalar	Visual*	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	NEG	NEG	NEG
Free Water	scalar	Visual*	NEG	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	33.8	33.9	33.6
Visc @ 100°C	cSt	ASTM D7279(m)	5.6	---	5.7
Viscosity Index (VI)	Scale	ASTM D2270*	102	---	109
Separability	oil/h ₂ o/em	ASTM D1401*	42/38/0 (15)	---	41/39/0 (15)
Air Release Time	min	ASTM D3427*	3.10	---	3.10
Foam Tendency	I/II/III	ASTM D892*	250/40/190	---	190/40/260
Foam Stability	I/II/III	ASTM D892*	0/0/0	---	0/0/0
ASTM Color	scalar	ASTM D1500*	<3.5	---	<3.5
Rust Prevention	PASS/FAIL	ASTM D665*	PASS	---	PASS
Oxidation Test (RPVOT)	minutes	ASTM D2272*	2755	---	2655

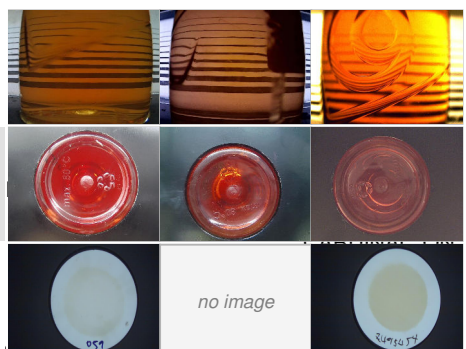
SEDIMENT	method	limit/base	current	history1	history2
Pentane Insolubles	%	ASTM D893(m)*	0.073	---	0.006
Toluene Insolubles	%	ASTM D893(m)*	0.047	---	0.002

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					
MPC					



Laboratory Sample No.
Lab Number
Unique Number
Test Package

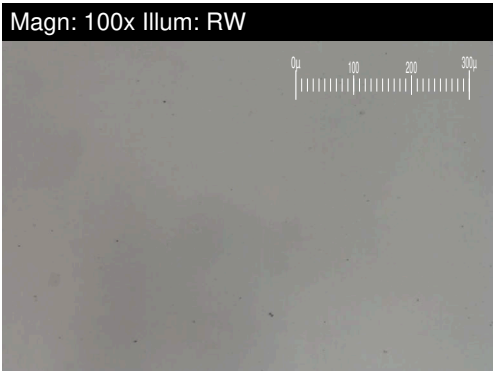
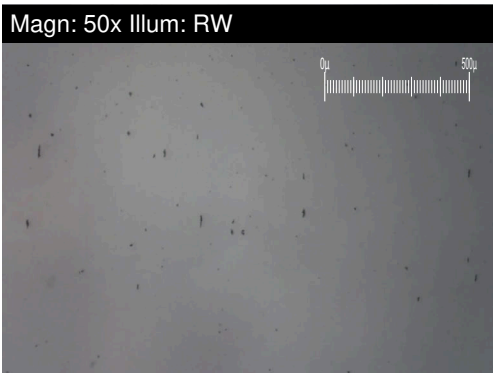
To discuss this sample report, cc
 Test denoted (*) outside scope o
 Validity of results and interpretation are based on the sample and information as supplied.



F: (613)657-1402

FERROGRAPHY REPORT

Machine Id
WESTINGHOUSE 501D
 Component
Turbine
 Fluid
PETRO CANADA TURBOFLO XL32 (4250 GAL)

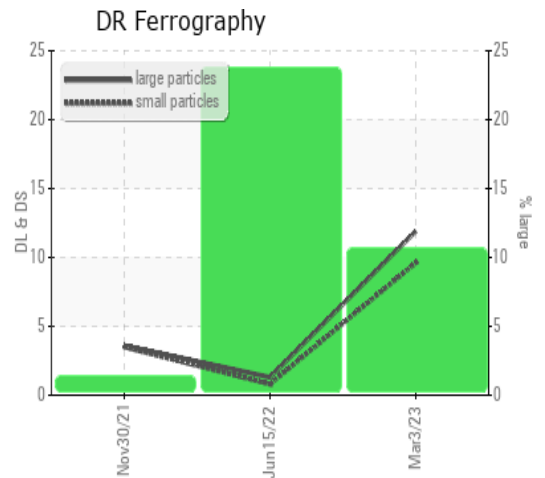


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		11.9	---	1.3
Small Particles		DR-Ferr*		9.6	---	0.8
Total Particles		DR-Ferr*	>---	21.5	---	2.1
Large Particles Percentage	%	DR-Ferr*		10.7	---	23.8
Severity Index		DR-Ferr*		27	---	1

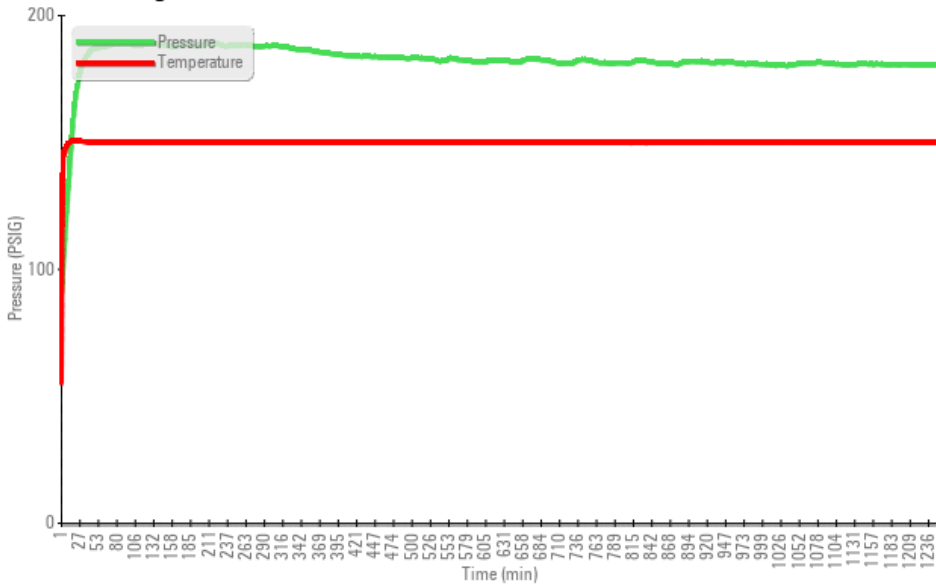
FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		1		1
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		1		1
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*				
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		1		1
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		1		1

WEAR

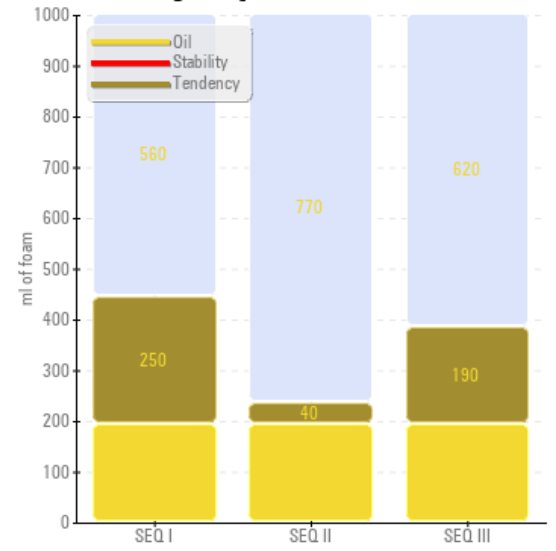
All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.



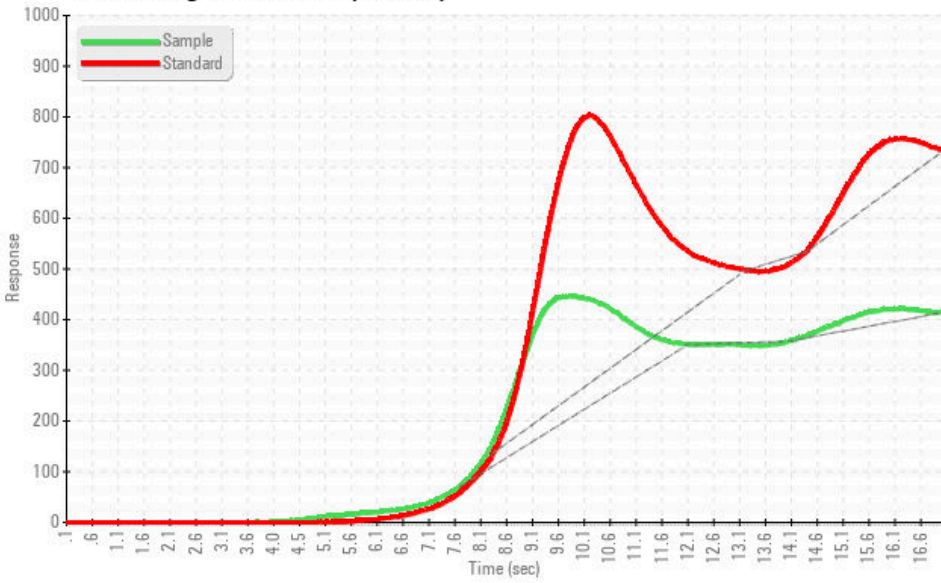
Rotating Pressure Vessel Oxidation Test



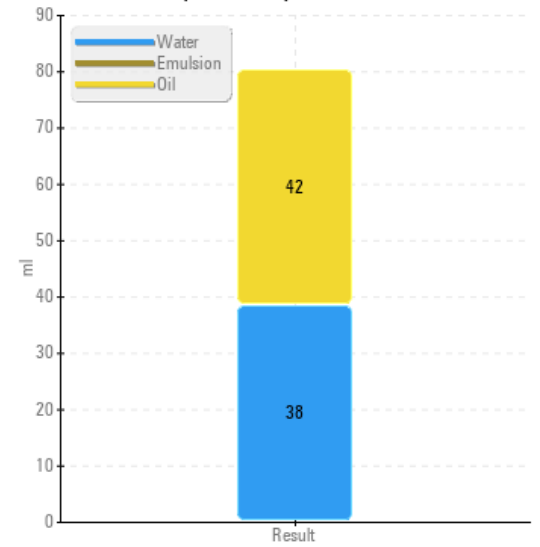
Foaming SEQ I/II/III



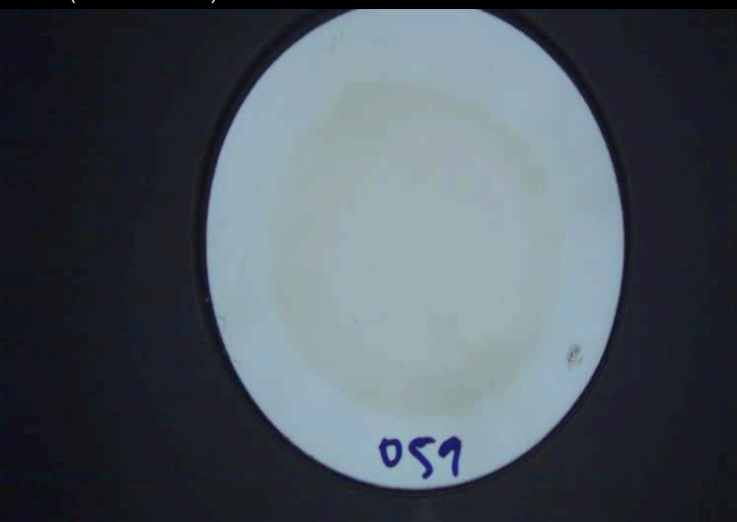
Remaining Useful Life (RULER)



Water Separability



MPC (Varnish Test)



Sample Color & Clarity

