Full Service
Lubrication Change out of Mission Critical Turbo Machinery

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Table of Contents

Section 2 Site Reference
Full Service Lubrication Change out of Mission Critical Turbo Machinery

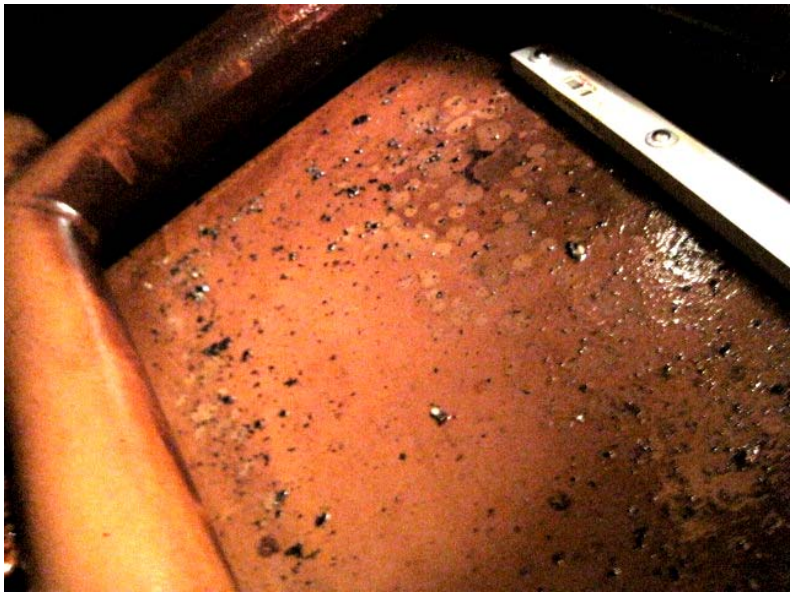
Project detail

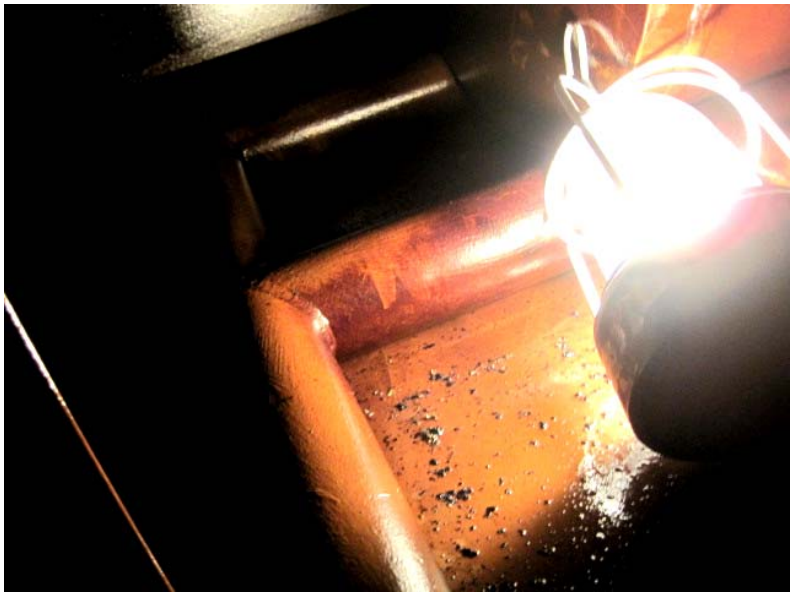
- **Transfer oil to tank**
- **Clean Lube oil reservoir**
- **Filtration & Purification**
- **Oil transfer to main reservoir**
- **Filtration & Purification until result follow standard.**

Our tank and Purification unit for remove wear particle solid particles

Gas Turbine Reservoir Cleaning

Before Clean reservoir





After clean reservoir

Section 3 Result & Lab Analyzed

Filtration oil Before Filtration Nas 7 After Filtration Nas 4

Sample ID: 1
Date: 22 JUN 2018
Time: 09:56:30

Run #1: ISO 20/17/12

Particle Size	Code	Cumulative Counts/1mL
4um(c)	20	5270.100
6um(c)	17	923.400
10um(c)	14	88.000
14um(c)	12	37.200
21um(c)	11	13.650
38um(c)	8	2.000
70um(c)	6	0.350

Run #2: ISO 19/16/12

Particle Size	Code	Cumulative Counts/1mL
4um(c)	18	2601.050
6um(c)	16	448.950
10um(c)	13	61.850
14um(c)	12	28.550
21um(c)	11	10.250
38um(c)	8	1.500
70um(c)	5	0.250

Run #3: ISO 18/16/12

Particle Size	Code	Cumulative Counts/1mL
4um(c)	18	2051.450
6um(c)	16	371.650
10um(c)	13	68.950
14um(c)	12	36.250
21um(c)	11	15.400
38um(c)	9	3.500
70um(c)	7	0.650

AVERAGE RESULTS

Avg code: ISO 19/16/12

Before Filtration

ISO 19/16/12 - NAS 7

Sample ID: 1
Date: 24 JUN 2018
Time: 13:25:53

Run #1: ISO 16/13/10

Particle Size	Code	Cumulative Counts/1mL
4um(c)	16	435.600
6um(c)	13	75.350
10um(c)	11	13.600
14um(c)	10	7.050
21um(c)	9	2.700
38um(c)	6	0.600
70um(c)	3	0.050

Run #2: ISO 16/13/ 9

Particle Size	Code	Cumulative Counts/1mL
4um(c)	16	377.850
6um(c)	13	65.500
10um(c)	11	11.800
14um(c)	9	4.350
21um(c)	8	1.800
38um(c)	6	0.450
70um(c)	3	0.050

Run #3: ISO 16/14/10

Particle Size	Code	Cumulative Counts/1mL
4um(c)	16	558.150
6um(c)	14	93.900
10um(c)	11	12.750
14um(c)	10	5.700
21um(c)	8	1.950
38um(c)	7	0.700
70um(c)	3	0.050

AVERAGE RESULTS

Avg code: ISO 16/13/10

After Filtration

ISO 16/13/10 - NAS 4

Lab Analyzed

MRT LABORATORIES

305 Nebraska
South Houston, TX 77588
713-944-8381

Customer Information 1015068
Lubrication Systems
2 Banplong, T. Mab Ta
A. Muang Rayong,
Rayong 21150 21150
Attn: Vannanai

Sample Information 0002
Site SCC
Area Samudpakran
Unit Gas Turbine A
Equipment Gas Turbine A
Description Oil in Tank Filtration/Purify
Sample Pt Key
Fluid in Use shell VG 32
Fluid Grade ISO VG 32
Lst Fluid Change

Equipment Information
Equipment Type Unknown
Cooled Cooling Source
Filtered Yes Filter Size 3 Micron
Lst Filter Change
Sump Capacity
Lubrication System
Lubed Components
Bearing Types
Gear Types

Sample Evaluation

Wear | Physical | Contaminant | Lab

Sample Information			Wear Metals									Additive Metals							Contaminant Metals				
Samp No	Hrs/Miles	Samp Date	Iron	Coppe	Tin	Lead	Chrom	Nickel	Alum	Titan	Silver	Calciu	Magne	Zinc	Phos	Bariu	Molyb	Antim	Silico	Sodiu	Boron	Potas	Vanad
10061608	Final	06/21/2010	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
10061607	Before	06/08/2010	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0
	Watch Advisory		10	10	10	10	5	5	10	5	5								10	40	10	15	10
	Warning Advisory		20	20	20	20	10	10	20	10	10								20	40	20	30	20
	Reference																						

Sample Information		Physical and Other Tests										
Samp No	Samp Date	V40C	TAN	FLASH	PCONT	KF	pc4	pc6	pc14	pc21	pc38	pc68
10061608	06/21/2010	33.9	0.06	420	10/13/10	40	6.7	44.1	6	12.8	0.2	0
10061607	06/08/2010	33.9	0.08	415	20/17/12	130	8900.7	1298.3	34.6	7298.5	1357.7	0.5
Watch		61.2-74.8	1	400	20 /18 / 16	500						
Warning		57.8-78.2	1.5	375	21 /19 / 17	750						
Ref												

Sample Information		Other Tests	Samp No	Comments / Recommendations
Samp No	Samp Date			
			10061608	No significant for abnormal resample at normal interval
Watch				
Warning				
Ref				

NAS Before Purify	**Nas 7**
Water Before Purify	**130 ppm**
NAS After Purify	**Nas 4**
Water After Purify	**40 ppm**

THERMO*JET*® H 2000 SERIES

The Ultimate Way To Dehydrate Oils Used In The Hydrocarbon Processing Industry

Available as Cart Mounted and Trailer Mounted Units

FEATURES

- Simplicity = Reliability & Maintainability
- Choice of Steam or Electric Heater
- Proprietary Dual-Stage Jet Mixer
- Corrosion-Resistant Stainless Steel Construction
- Particulate Filtration to ISO 13/10
- 2 Close-Coupled Gear Pumps Driven by Single Motor
- Streamlined Instrumentation with Panel Mounted Gauges
- Enclosed Cabinet Design with Hinged Door for Easy Access
- CSA Listed for Class I Division 2 Groups B/C/D T4
- Available in Various International Voltages
- Oil Vapor Discharge Well within OSHA Standards (2.3 mgs/m³ vs. 5 mgs/m³)
- 0-8 PPM Oil Discharge in Condensate, Far Surpassing EPA Regulations of 15 PPM For "Clean" Sewers
- Process Flow Rate 180 GPH (680 lph)

LEGEND

1. 12KW Oil Heater
2. Filter
3. Dual-Stage Jet Mixer
4. Separation Tank
5. Level Controller
6. Oil Pumps & Motor
7. Oil In/Out & Sight Glass
8. Condensate Purifier Assembly
9. Condensate Trap
10. Oil Mist Eliminator/Vapor Exhaust

BENEFITS

- Removes All Three Forms of Water
- No Waste Oil Disposal
- Improved Machinery Reliability
- No Machinery Failures Due To Poor Quality Oil
- No Oily Discharge
- No Emissions Penalties From Environmental Agencies
- Greatly Reduces New Oil Purchases

LF/LFM - Low Pressure High Flow Assemblies

LF flow rate to 1120 lpm, 300 gpm / LFM flow rate to 16875 lpm, 4500 gpm

APPLICATIONS

- Hydraulic and Lubrication oil
- Fuel and Fuel oil
- Rolling mill oil
- Processing liquids
- Bulk oil handling - Transfer and clean up
- Off-line systems and flushing
- Power generation
- Primary metals
- Mobile flushing systems
- Particulate and water removal
- Transfer line machining coolants
- Large gearbox filtration

PRODUCT SPECIFICATIONS & FEATURES

Max Flow Rate Visc: 150 SUS, 32 CTS	**Recommended Series**
100 gpm (375 lpm)	LF Single length
150 gpm (560 lpm)	LF Double length
300 gpm (1125 lpm)	2 x LF Double parallel mount
4500 gpm (16875 lpm)	LFM multiple element series (call for sizing assistance)
Operating Pressure	**Standard 150 psi (10 bar)**
	Available up to 3000 psi (212 bar)
Pressure Indicators	**Supplied Standard**
Up to 250 psi Operating	Two visual pressure gages differential indicator available
450 psi and higher	Differential pressure supplied standard
Maximum Temperature	**Standard 250 F**
	Call for high temperature specs

ASME U & UM CODE REQUIREMENTS

Standard vessels are manufactured to ASME code standards, but not certified. ASME U and UM code certification is available as an option. See table 9 under the Filter Assembly part number guide on page 2 for ordering detail. Please call for price adders when specifying Code certification.

- Carbon steel construction standard (304 & 316 stainless available).
- Duplexing option available for continuous filtration during filter element change-out.
- In-line and 90 degree port configuration available .
- Pressure gages are supplied standard for housings up to 250 psi operating (differential indicator is available). Differential pressure indicator is supplied standard for housings with operating pressure 450 psi and higher.
- Easy to service swing-lid design with eye nuts assures no lost hardware, hydraulic lift option available.
- Marine grade epoxy exterior finish for non-stainless steel assemblies
- Accepts coreless design with positive o-ring seals or industry standard 6 x 18 and 6 x 36 with gasket seals.
- Vent/bleed port standard in housing cover.
- 2" drain and cleanout port allows for quick draining and easy access for sump cleanout.
- Hy-Pro Dualglass filter element media technology validated per ISO16889 multipass and DFE (modified ISO16889) industry leading multipass testing.

Harmonizing industry standards in a portable

Model PC4000 Portable Liquid Particle Counter

FEATURES

- Rugged and lightweight
- Immediate onsite results
- Reports new SAE and ISO cleanliness classifications, 4/6/14 µm(c)
- Harmonizes NAS 1638 to new MTD calibration
- Bar code wand for simple "scan and run" operation
- Laser-optics precision
- Battery powered, fully portable
- Built-in printer and display
- CountSpec™ software optional
- Multiple languages

APPLICATIONS

- Proactive maintenance
- System monitoring
- Extend system reliability
- Manufacturing "roll off" certification
- Identify maintenance cycles
- Schedule repair periods
- Online system cleanliness
- Validate facility monitoring, connects directly to PM4000

The HIAC Model PC4000 Portable Liquid Particle Counter combines rugged, portable construction with laboratory instrument performance. It is a cost effective, easy to use, contamination measurement tool, designed to run online analyses. The Model PC4000 offers the flexibility required in today's multi-application workplace.

Hydraulic component and system manufacturers agree–over 70% of machine failures are caused by contamination. Contamination levels that exceed hydraulic and lubrication tolerances cause premature failure, increased maintenance costs, system power loss, and costly down time. Contamination comes from many sources, including ingression through seals, breathers, debris from repairs, as well as new fluids. These sources of contamination often start the cycle of wear, which when left unmonitored, quickly escalates to down time or even catastrophic failure.

Optical particle counters allow hydraulic systems and fluids to be routinely monitored for cleanliness. Test results can initiate corrective actions, resulting in extended machine life, reduced operation costs, and scheduled maintenance periods. The Model PC4000 portable particle counter was specifically designed with your hydraulic needs in mind. Whether performing system diagnostics or QA testing for final cleanliness, the PC4000 delivers the most valuable indication of hydraulic system condition available today.

With 4 µm(c) traceable sensitivity and laser diode precision, the Model PC4000 reports particle counts to the newest industry standards. This fully self-contained counter accurately qualifies your samples, performing analyses in the field or factory, with the precision of laboratory systems.