



## Gearboxes : Millmerran Operating Company

### Millmerran Operating Company

Understanding the effects of contamination on the equipment at Millmerran Power Station has the maintenance department always looking for ways to improve existing practices.

Filter Technology's timely call lead to a buggy being supplied to evaluate its worth on the mills gearbox oils for a trail period.



The success of this trail lead to Millmerran purchasing two FM504 buggies, one to do the Mill gearboxes (picture below) and the other for Transformer oil.

The results attached show Mill 2E on the previous routine sample was at an ISO 22/13 on the 9/2/04. The FM 504 was connected in early March and after a week the sample taken on the 17/3/04 had the ISO 15/12 a 96% reduction in particulate contamination, wear metals, Iron reduce by 18%, PQ90Fe-mg/ltr by 81% and water reduced by 52%.



The results attached on the transformer oil saw the ISO reduced from 17/12 to 15/12, a reduction of 75% in particulate contamination, water reduced by 15%.

Site: Millerran Power Station  
 Attention To: ALEX UNG / TREVOR BAVINGTON (KELLI LAZELL)  
 Machine: 2EMILL 2E Mill  
 Sample Location: Gearbox  
 Oil Type: MOBILGEAR 634

# Oil+Test

4 Walter Street | PO Box 490  
 Singleton NSW 2330  
 Phone: (02) 6571-1444  
 Facsimile: (02) 6571-4433 OKAY

Sample Date	9-Feb-04	17-Mar-04
Analysis Report No.	207,204	208,873
Service Meter Reading	0hrs	0hrs
Electric SMR	0hrs	0hrs
Oil Hrs	-	-
Oil Changed?	No	No

Wear Metals	Limit	ppm	ppm	ppm	ppm	ppm	ppm
lead						1	2
iron	300					15	11
aluminium	40					0	1
copper	60					5	3
chromium	15					0	0
tin						0	1
nickel	15					0	0
silver						0	0
titanium						0	0

Contaminants	Limit	ppm	ppm	ppm	ppm	ppm	ppm
silicon	80					0	0
sodium						1	1
vanadium						0	1

Oil Additives	Limit	ppm	ppm	ppm	ppm	ppm	ppm
magnesium						0.7	0.6
zinc						19	13
molybdenum						0.4	0.2
calcium						15	18
phosphorus						139	144
boron						5	2
barium						3	0.6

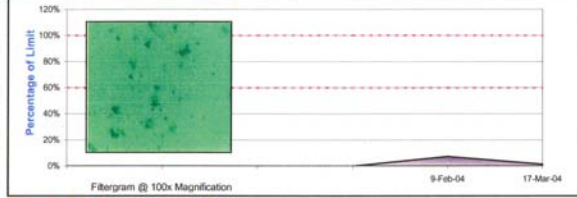
Physical Tests							
TBN						0	0
TAN						0.00	0.00
fuel dilution %						0	0
water %	0.1					< 0.1	< 0.1
viscosity index						102	99
visc @ 100oC - Cst	30					31.81	30.79
visc @ 40oC - Cst	445					450	444

FTIR Analysis							
soot - abs						0	0
glycol%						0	0
water ppm						114	52
oxidation - abs						0	0
nitration - abs						0	0
sulphation - abs						0	0

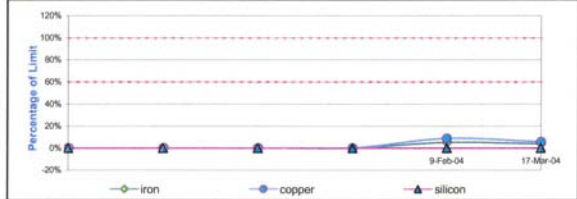
Particle Analysis							
particle count in 1ml						65686	892
ISO-4406 6um \ 14um	18/15	-	-	-	-	22/13	15/12
PQ90 Fe - mg \ ltr	300					22	8

NOTE: This machine oil condition report should be used in conjunction with normal maintenance practices. All care will be taken in processing and analysing samples but no express or implied guarantee is offered in regard to the continuing operation or condit

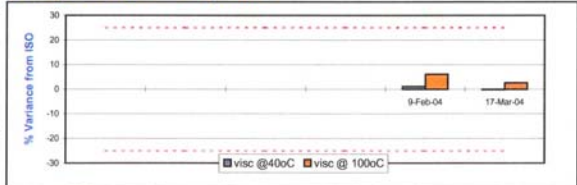
PO - Ferrous Wear Debris (Fe mg \ ltr)



Major Small Particle Element Trends



Viscosity Condition From New Oil Specification



Comments & Recommendation

Solid particle contamination has improved. Results within acceptable limits. Continue with regular maintenance and monitoring.

Site: Millerran Power Station  
 Attention To: ALEX UNG / TREVOR BAVINGTON (KELLI LAZELL)  
 Machine: 1MTO Unit 1 Main Turbine Oil  
 Sample Location: Turbine  
 Oil Type: SHELL TURBO 46

# Oil+Test

4 Walter Street | PO Box 490  
 Singleton NSW 2330  
 Phone: (02) 6571-1444  
 Facsimile: (02) 6571-4433 OKAY

Sample Date	5-Dec-03	22-Jan-04	9-Mar-04	15-Mar-04
Analysis Report No.	204,094	206,312	208,871	208,872
Service Meter Reading	0hrs	0hrs	0hrs	0hrs
Electric SMR	0hrs	0hrs	0hrs	0hrs
Oil Hrs	-	-	-	-
Oil Changed?	Unsure	No	No	No

Wear Metals	Limit	ppm	ppm	ppm	ppm	ppm	ppm
lead	10			0	0	0	1
iron	10			0	0	0	0
aluminium	10			0	0	0	1
copper	10			0	0	0	0
chromium	10			0	0	0	0
tin	10			0	2	0	2
nickel	10			0	0	0	0
silver	10			0	0	0	0
titanium	10			0	0	0	0

Contaminants	Limit	ppm	ppm	ppm	ppm	ppm	ppm
silicon	10			0	0	0	0
sodium	10			0	0	0	0
vanadium				0	1	0	1

Oil Additives	Limit	ppm	ppm	ppm	ppm	ppm	ppm
magnesium				0	0	0	0
zinc				0.8	1	0.8	1
molybdenum				0	0	0	0
calcium				0.3	0	0.4	0
phosphorus				5	3	50	15
boron				0	0.1	0	0
barium				2	0	3	0.3

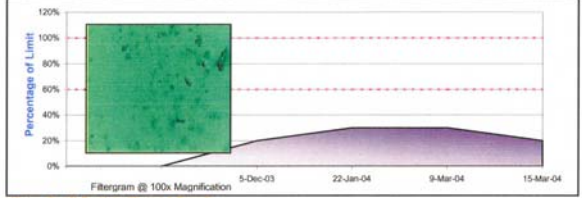
Physical Tests							
TBN						0	0
TAN	1.00			0.15	0.18	0.18	0.18
fuel dilution %				0	0	0	0
water %	0.01			< 0.1	< 0.1	< 0.1	< 0.1
viscosity index				108	115	108	108
visc @ 100oC - Cst	7			6.83	7.21	7.05	7.04
visc @ 40oC - Cst	46			45	47	47	47

FTIR Analysis							
soot - abs				0	0	0	0
glycol%				0	0	0	0
water ppm	70			88	45	48	39
oxidation - abs	10			1.00	1.00	0	0
nitration - abs	10			0	0	0	0
sulphation - abs				0	0	0	0

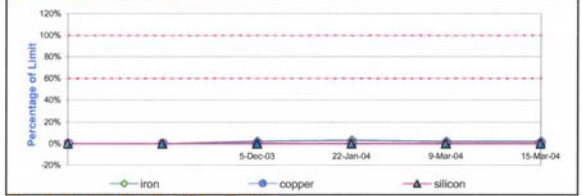
Particle Analysis							
particle count in 1ml				24660	5463	2857	699
ISO-4406 6um \ 14um	16/13	-	-	20/17	18/14	17/12	15/12
PQ90 Fe - mg \ ltr	10			2	3	3	2

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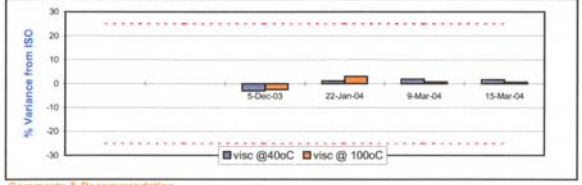
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Comments & Recommendation

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