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FOLLOW UP
FUEL EFFICIENCY STUDY AT
DARLOT GOLD MINE
POWER GENERATION FACILITY

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C O N T E N T S

Appendix

EXECUTIVE SUMMARY

The FTC Combustion Catalysts, manufactured and marketed by Fuel Technology Pty Ltd, have proven in laboratory and field trials to reduce fuel consumption in the range 3% to 8% under comparable load conditions and to also substantially reduce carbon emissions.

Following Fuel Efficiency tests conducted in Darlot Gold Mine's Power Generation facility where a **3.7%** fuel efficiency was measured following FTC treatment of fuel, identical tests after a further two months FTC treatment was scheduled with these conducted 12 December 2006.

The International Engineering test procedure "Carbon Mass Balance" (CMB) as initial tests was employed in this test program.

The average net efficiency gain (reduction in fuel consumption) measured by the second CMB test procedure was **3.3%**.

INTRODUCTION

Baseline (untreated) fuel efficiency tests were conducted on four Caterpillar 3516 Generator sets, Nos 6, 7, 9 and 10 during the week commencing 26th July 2006 employing the CMB test procedure. Bosch Smoke Tests were also conducted in conjunction with CMB tests.

Darlot Gold Mine purchased and installed an FTC catalyst metering system which was calibrated and commissioned following completion of the baseline tests. This unit injected FTC-3 Catalyst into the fuel supply as fuel was pumped from bulk storage tanks to Power Generation facility day tank.

The first treated tests were conducted during the week commencing 25th September 2006 on Generator sets 7, 9 and 10 only as unit 6 was undergoing a rebuild.

The second treated tests were conducted 12th December 2006 on Generators 9 and 10 only.

Power Generation loads for both treated CMB tests were significantly lower than experienced during untreated tests and calculations have been applied to compensate for this factor.

TEST METHODS

The Carbon Balance Measurement (CB) is a procedure whereby the mass of carbon in the exhaust is calculated as a measure of the fuel being burned. The elements measured in this test include the exhaust gas composition, its temperature and the gas flow rate calculated from the pressure and exhaust stack cross sectional area. Whilst this is an engineering standard test (AS2077-1982) in field testing we are unable to comply with the procedure in relation to employing a chassis dynamometer. However, in the case of power generation the alternator substitutes as a mechanism to apply a constant load.

TEST RESULTS

The Table below provides results achieved in the second CMB test program. As the kWs produced during the treated tests were significantly lower than that produced during untreated tests, results have been calculated as grams/second per kilowatt and shown in the following table.

Carbon Mass Balance Fuel Consumption Second Test Results
grams per second flow of carbon per kW

Unit No.	Baseline 26/7/06 g/s per kW	Treated12/12/06 g/s per kW	Variation
9	0.01784	0.01721	-3.5%
10	0.01772	0.01718	-3.1%
Average g/s	**0.01778**	**0.017195**	**-3.3%**

The second CB test procedure confirms the first test that addition of FTC-3 Catalyst to the fuel supply provides a reduction in carbon flow (fuel consumption) of **3.3** to **3.7%**. Computer printouts of results and raw data sheets are contained in the *Appendix*.

Bosch Smoke Tests

A Bosch smoke test was also undertaken during second set of tests and results are shown in Table 2. Smoke emissions are generally reduced by up to 30 - 40% following the introduction of FTC Combustion Catalyst.

This second treated test has resulted in a slight decrease in smoke emissions from first treated tests. *As the Bosch Smoke test Scale reads from 0.1 (very clean) to 9.9 (very dirty) we are measuring at a very low base from the start.*

TABLE 2
Bosch Smoke Measurements

Unit No.	Baseline 26/7/06	Treated 12/12/06	Variation
9	0.6	0.7	7%
10	0.7	0.8	14%
Average	**0.65**	**0.75**	**15%**

CONCLUSION

These carefully controlled second test procedures conducted on Caterpillar 3516 generator sets Nos 9, and 10 provide clear evidence of reduced fuel consumption in the range **3.3%**. This is within repeatability of initial test results of **3.7%.**

Additional to the fuel economy benefits measured and a reduction in greenhouse gas emissions due to a more complete combustion of the fuel, a reduction over time in engine maintenance costs will also be realised.

Appendix "A"

Carbon Balance Printouts

Appendix "A"

Carbon Balance Printouts

Appendix "B"

Carbon Balance Data Sheets