

Training Delivers Cost Savings to Businesses

CATERPILLAR INSTITUTE (VIC-TAS) looks at lower operation costs and fuel consumption following the delivery of the new Eco-Operator Training Course.

In a series of closely monitored case studies conducted by Caterpillar Institute, the importance of operator training was confirmed by impressive savings in fuel as well as improved safety and reductions in carbon emissions.

The new Caterpillar® Eco-Operator Training Course focuses on best practice techniques which will lead to reduction in fuel consumption as well as a knock-on effect on other costs such as tyres & tracks, reduction in carbon emissions and an increase in engine working life.

The case studies were a series of actual training days, they consisted of both theory and practical sessions and they were conducted on-site at various locations. For the practical session, the participating groups of operators were asked to perform a controlled truck loading function before commencement of training while engine performance data was simultaneously collected and monitored by Caterpillar® Electronic Technician Software (ET). The practical session required the operators to perform a set truck-loading task before any theory training, which they then repeated later in the day after the training had been conducted.

The ET software used to collect live data included cycle time, fuel burn rate and engine speed. All this was being wirelessly transmitted from the engine during both of the loading operations. The captured live data showed up any variations in fuel burn rate and performance changes.

The key outcomes evidenced from the data collected showed:

- Significant cost savings in fuel burn.
- Extension in engine working life before major engine surgery was recommended.
- Considerable reduction in carbon emissions.

Table 1 shows data captured at the commencement of training and at the end of the training day. Featured is one operator who was MOST improved and showed a reduction in fuel burn by almost ten litres per hour and one operator who was the LEAST improved and showed fuel burn reduction of less than one litre per hour. The AVERAGE of all operators who participated however was a significant three and a half litres per hour savings in fuel burned.

Table 2 shows the results of data, which was captured on-site before and after the actual training day (up to a week in some cases) in a real time work environment. One operator from each group was selected to be monitored. The data here is a combined average of the information captured from each of the operators who participated and also shows a reduction in fuel burn, a significant saving of four and a half litres per hour.

The first and the most significant savings statistic to note are the reductions in fuel consumption. Companies who put their operators through this advanced techniques and best practice training should see significant cost savings. Depending on the size of the fleet, this could be in the hundreds of thousands of dollars.

Another significant savings can come from extended engine life by delaying the recommended major surgery time. Caterpillar's data indicates that the engine is reaching the end of its current working life when a certain number of litres of fuel have been consumed. If the average fuel consumption was reduced by the findings here, even at three to five litres per hour, this would equate to an extension in working life of thousands of hours before major engine surgery was recommended.

In addition to the fuel savings and possible engine working life extension, every litre of fuel consumed creates 2.7 kilograms of carbon emissions. Any reduction in fuel burn could not only save thousands of dollars in fuel reductions, hundreds of thousands in some cases, it will also result in a reduction in carbon emissions.

The CMPA has held discussions with Caterpillar Institute (Vic-Tas) about working towards incorporating the Eco-Operator Training as a component of the *Certificate II or III Extractive Industries Operations*.

The Caterpillar Institute (Vic-Tas) has scheduled a series of the Eco-Operator Training Courses which will be conducted at the institutes Clayton campus. Course can be conducted on site, for more information and dates on Caterpillar® Eco Operator Training, contact The Caterpillar Institute . ■

For more information on Caterpillar® Eco Operator Training, contact The Caterpillar Institute on (03) 8561 8700, email civtinfo@cat.com or visit www.caterpillarinstitute.com.au



Table One

Operator	Cycle Time (secs)	Engine (RPM)	Liters / Hr	Cycle Time (secs)	Engine (RPM)	Liters / Hr	Fuel Burn Reduction
Most	58	1597	45.36	73	1338	35.57	-9.79
Least	88	1322	38.16	86	1279	37.49	-0.67
Average	78	1374	39.90	79	1272	36.60	-3.56

Table Two

Cycle Time (secs)	Engine (RPM)	Liters / Hr	Cycle Time (secs)	Engine (RPM)	Liters / Hr	Fuel Burn Reduction
Pre Training			Post Training			
125	1445	38.70	149	1269	34.19	-4.51



Caterpillar Institute VIC-TAS

Schelbert AG: How to save 26 percent of diesel fuel

In an all-day class, the construction machinery operators at Schelbert AG Muotathal, Switzerland learned how to save energy while operating their heavy equipment. The training results were a surprise for all participants: Simply by reducing engine speed by 10%, they were able to save up to 26% of diesel fuel—and this with a loss in performance of only 5%, which can hardly be felt in many applications.

The longer the day lasted, the bigger their eyes got: about two dozen operators from Schelbert AG Muotathal, a Swiss heavy construction company, were participating in a training class titled “Saving fuel and using machines efficiently.” After a morning of theory, they were able to practice what they had just learned in the afternoon at the Selgis landfill for pretreated hazardous and construction waste near Ried-Muotathal. Their job was moving materials using a large excavator. They repeated the same work several times, reducing the speed of the diesel engine step-by-step. This process was measured and recorded as precisely as the fuel used, as well as the time per cycle.

The results were amazing: Even though the engine speed decreased by 10 percent, the output only sank by 5 percent. And instead of a cycle time of 87 seconds at full rpm’s it took the Schelbert operators only 91 seconds. While this time difference is negligible over the entire shift, diesel use changed considerably: thanks to reduced engine output, they used 26 percent less fuel, or more than a quarter! Urs Suter, Schelbert’s shop manager, was amazed, “I would have never thought that the savings are that enormous.”

Rudolf Ammann, Director of Avesco AG Academy, which taught the class at Schelbert AG, was also very pleasantly surprised, “It turned out that a lot of diesel can be saved using reasonable methods. It doesn’t always take full throttle!” “Together with the use of eco-diesel, which we have already been using for a while now, measures such as they were practiced in this class for operating machines optimally will result in continued clear reductions of our CO2 emissions,” says general manager Georges Scheiber. “That will be good for the environment, and ultimately, of course also for us.”

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