



DRIVING DOWN LIFE CYCLE COSTS

Longer engine life-to-overhaul and on-site support rated “second to none” are Cummins cornerstones of NRW’s fleet efficiency at the Middlemount coal mine in Queensland’s Bowen Basin.

Thirty-one Cummins QSK50 and QSK60 engines, all with modular common rail fuel system (MCRS) technology, are powering Hitachi excavators and haul trucks at Middlemount as part of NRW’s mining services contract with the mine.

The initial changeout strategy for the 2000 hp QSK50 and 2500 hp QSK60 engines in the Hitachi haul truck fleet at Middlemount was 25,000 hours. “If we achieve that we consider we’ll be doing well,” was the comment from NRW maintenance personnel at the time.

That life-to-overhaul strategy has now extended to 30,000 hours based on fuel burn, with one QSK50 actually running out safely to 32,000 hours.

For the QSK50 and QSK60 engines in the excavator fleet at Middlemount, initial life-to-overhaul was 18,000 hours but this has now been extended to 20,000 hours without any issues in a digger operation where average engine load factors are as high as 80%.

Key to fleet efficiency.

NRW’s maintenance manager at Middlemount, Kerry Ward, pinpoints a key reason for the efficiency of the Cummins-powered Hitachi fleet. “The support we get from the Cummins team is second to none,” he says. “It’s a professional relationship.

“Our maintenance practices are very good and we have a team here that cares. Preventive maintenance is a strong focus. We tend to over service but I’d rather over service than under service,” he adds.

Above: Preventive maintenance is a strong focus at Middlemount for obvious reasons.

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On-site support is a Cummins cornerstone at Middlemount. From left: Cummins product support rep Bob Lenton, NRW maintenance superintendent Ian Dukes, NRW maintenance manager Kerry Ward, Cummins site rep Andrew Rio.

Life to overhaul is 30,000 hours for the QSK50 and QSK60 engines in the NRW haul truck fleet.

“We get results... that’s the most important thing.”

Bob Lenton and Andrew Rio are in the front-line for Cummins – Lenton as product support representative and Rio as site technician – and both are held in high regard by the NRW maintenance team, as is the Cummins Mackay branch in general.

Mining began at Middlemount as a greenfield project in mid-2011 and today is a joint venture between Peabody Energy and Yancoal. Targeted run-of-mine (ROM) production in 2018 is 5.2 million tonnes, increasing to 5.8 million tonnes in 2019.

The Middlemount project was NRW’s first mining contract in Queensland. Established in Western Australia in 1994 as a small, privately run civil construction and general plant hire firm, the now-listed NRW has become a leading contractor in the mining and civil construction industries. Last year, NRW acquired Golding, one of Queensland’s largest civil construction, mining services and urban development contractors.

Hitting availability targets.

At Middlemount, the frontline Hitachi excavator fleet comprises one 3000 hp EX5600-6 with dual QSK50 engines, one 2800 hp EX5500-6 also with dual QSK50 engines, four 1950 hp EX3600-6 units each with a single QSK60 engine, and one 1085 hp EX1900-6 with the QSK38.

All are meeting or exceeding NRW’s machine availability target of 90%. The EX5600-6, the biggest excavator in the fleet with its operating weight of 560 tonnes, recently clocked up 630 hours for a month which is notably high utilisation. Over a recent 12-month period, the EX5600-6 and EX5500-6 averaged close to 6,500 hours for the year. The EX5600 had clocked up 41,000 machines hours at the end of the period, and the EX5500 over 51,000 hours.

The four QSK60-powered EX3600-6 excavators with their 360-tonne operating weight were also performing well with average availability of 92% and machine hours ranging from 30,000 to nearly 54,000.

NRW’s haul truck fleet at Middlemount totals over 40 units, 22 of which are a mix of Hitachi AC-drive EH4000 and EH3500 units. A 228-tonne capacity truck, the EH4000 is powered by the QSK60 rated at 2500 hp, while the 168-tonne capacity EH3500 has the 2000 hp QSK50. Both the QSK60 and QSK50 are comfortably achieving the 30,000-hour life-to-overhaul.

Cummins durability rates highly.

All engines, both in haul trucks and excavators, undergo a major inspection at 10,000 hours; the only components changed out at mid-life are the turbochargers on the excavator engines – testimony to the durability of the QSK50 and QSK60. A high percentage of the modular common rail fuel system (MCRS) injectors achieve full engine life.

Cummins site technician Andrew Rio monitors the ECM on the excavator engines weekly to check for any potential issues. Regular engine condition monitoring includes oil sampling every 250 hours. The engine oil change interval is 500 hours, with the excavators having an oil reserve system that virtually doubles sump capacity.

The longer life-to-overhaul now being achieved by NRW enables the company to eliminate at least one engine rebuild from the life of the trucks and excavators which significantly lowers overall life cycle costs. Add in the first-class maintenance practices for the NRW fleet at Middlemount, and a clear picture emerges of why it’s a successful results-driven operation. ■