

Engines battle with SA diesel

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Impending legislation to govern emissions will require action now to be compliant when official emission levels are regulated.

One solution is to consider an additive, but additives have long been considered to be a swearword in the industry, and are not trusted.

Engineering News spoke to Fuel Effect director **André Steyn** about additives, emissions and South African diesel.

Over two years ago Steyn was approached by the biggest diesel user in South Africa to investigate the possibility of an additive in diesel.

Diesel is a problematic liquid, as it is difficult to test and most buyers buy on blind faith, trusting that the diesel is of good quality, he says.

Steyn does not believe that South African diesel is at the same quality as that available worldwide.

Recent tests conducted on engines that had seized while under warranty indicate high levels

of corrosion, excessive wear and overheating.

This problem can be attributed to a number of factors, chief of which is that the technology in diesel engines has superseded the quality of the fuel.

Another reason is that refineries are in dire need of overhauling, he says.

As legislation requires that emissions are reduced and harmful elements such as carbon are removed from emissions as far as possible, engine manufacturers have designed engines with less tolerance for impure fuel.

The engines have smaller clearance gaps, and work at higher pressure, requiring more lubrication than older engines.

Now, engine manufacturers have gone as far as they can technically to reduce emissions.

"The technology in the engine world is at the point where the fuel must be manipulated to reduce emissions."

However, South Africa's fuel quality is years behind that of the rest of the world, says Steyn.

At a minimum, South Africa is one fuel generation behind and, in some instances, up to three generations behind, he says.

Previous Atlantis diesel engines could cope with the diesel, and parts were cheaper and easier to come by.

Current engines, produced in the latter years of last century, are more expensive to maintain and corrode quickly.

"You could lose an engine on one bad tank; I've seen an engine fail at 7 500 km."

Among the problems caused by local diesel include engines that overheat, and injectors that spray in dribbles and not as a fine mist, says Steyn.

Injectors that burn thinner fuels and operate at higher injection pressures, with reduced clearances, are more sensitive to low lubricity, Steyn says.

"Wear caused by low lubricity is the main reason for premature injector and pump wear-out."

In addition, heat, water and contamination lower lubricity, which causes poorer injector

From page 32

in the world of this nature, and others in the industry, as well as financial institutions, have expressed keen interest in taking part in the project."

The project is currently in the detailed feasibility-study phase involving front-end engineering and design studies (Feed), environmental-impact assessments and sourcing financing.

The Feed study will allow Energy Africa to identify the preferred development designs as well as get a better fix on the capital expenditure.

It will take about six months to complete and will be followed by the construction tendering phase.

The final investment decision is planned to happen at the end of next year and, if all goes according to plan, the first electricity should be available from the plant in 2009.

Energy Africa, as part of the Tullow group, intends continuing its involvement with oil.

"The group's growth strategy is focused on Africa."

The Tullow group also has interests in Asia and the UK.

ENGINEERING NEWS COUPON ON PAGE 80 E5714



Carbon build-up on inlet valves

performance, and once parts are worn they cannot be replaced.

Increased lubricity will reduce the rate of deterioration of injector spray-holes and new injectors will stay new for longer.

"In summary, the rate of injector

wear increases with pressure, particle size, particle number, reduced viscosities and low lubricity.

"Low-lubricity levels in fuel can cause premature engine failures and reductions in engine performance and engine life."

In addition, a reduction in fuel consumption or increase in efficiency of the engine must have the biggest effect on the bottom-line.

Yet Steyn points out that most additives cause more harm than good – this was the perception he initially had when approached to consider the lubricant.

The product, Fuel Effect, was patented worldwide in 1998 but has been in use since 1997, with impressive results.

A standard engine clean will save three per cent in fuel, Fuel Effect will save between six and nine per cent, depending on driving conditions.

This means that the process of combustion of the fuel is altered.

"Remember that the cost of Fuel Effect is relative to the total fuel bill; net savings will exceed five per cent on fuel alone."

Steyn says fuel burns more effectively, less soot is produced by the engine and the engine has sufficient lubrication with the additive.

This results in prolonged engine life, and reduced emissions of dangerous gases.

The product is a natural fuel catalyst derivative of oil, is 94% oil and has been tested locally and internationally in laboratories as well

as in practical application on South African vehicles.

"Field-testing, as subjective as it is, will always be important."

Several manufacturers have also indicated that the product does not cancel the original warranty of the vehicle.

"This is because the composition of the product is of such a nature that it is impossible to harm any engine, as the numerous original-engine manufacturer approvals testify."

In addition, Steyn offers a written guarantee on SABS 342 fuel that the product will reduce toxic emissions, improve consumption and extend the life of the engine.

"The results include longer injector, injector pump and fuel pump life largely due to the increase in lubricity; this directly improves consumption and engine life over time."

Particles per million, Nox, as well as other toxic emissions are lowered by Fuel Effect, due to the improved combustion in the chamber.

This means that Fuel Effect can assist in complying with new legislation and underground ventilation.

ENGINEERING NEWS COUPON ON PAGE 80 E5715