

# Base oil pre-treatment

**F**FS continues its programme of technological advancement with the replacement of the Distillation Cracking Stills (DCS) with Thin Film Evaporator (TFE) technology, recently commissioned at their Pietermaritzburg branch.

This short-path evaporator distills used lubrication oil removing 97% of the contaminants with virtually no heat damage to the oil. This is achieved with extreme vacuum, moderate heat and a very short residence time.

The benefit of this technology is the virtual elimination of heat damage or “cracking” of the oil, thus preventing the production of smelly sulphurous mercaptans and loss of product to incondensable gases. The contaminants in used lubrication oil include wear metals, products of combustion, fuel, glycol and the organo-metals in the additive packages.

The bare machine was imported from overseas and the infrastructure designed, fabricated, constructed, instrumented and commissioned by FFS engineering staff. This effectively halved the cost of the project.

The plant was designed to eventually accommodate two machines, each capable of processing 18 000 tonnes per year of used lubrication oil. The purpose of this process is to produce a feedstock clean enough to feed the existing hydrotreater for the production of base oil.

The hydrotreater uses heat, pressure, hydrogen and a precious



## ▲ Thin Film Evaporator.

metal catalyst to “fix” the damaged oil molecules. The pre-treatment is necessary to prevent the contamination of the catalyst. Base oil, with the appropriate additive package, is what makes lubrication oils.

FFS will shortly be introducing its Group I SN150 specification base oil to the market. This quality product has a ready market in a variety of process and lubrication oil applications in the local market. FFS are very excited to further the recycling of waste oils.

The project was delayed by six months due to the excessively long time required for a record of decision to be received – this despite the clear environmental benefits that this project introduced.

The oil is heated up, separated and cooled down in the closed system and all vapours pass through a

## What's inside?



*The friendly face behind the friendly voice : Dael Shaw, receptionist at FFS head office.*

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wet scrubber to remove the volatile organic compounds. ■

# De-ashed lube technology

**F**FS have now commercialised their own researched and developed thermo-chemical de-metalizing process for removing the ash from used lubrication oil. Product produced by the process has the added benefit of being a low sulphur oil (~0,6%), and is thus an environmental improvement on conventional HFO.

The real value of the process is its 99% oil recovery rate and thus very small waste component. The contaminants in used lube oil consist of wear metals, products of combustion and the organo-metals in the additive packages.

Lubrication oil manufacturers enhance the properties of base oils with the addition of various additives

made from metals, such as zinc, calcium, phosphorus and potassium. These additives are made very stable with the use of dispersants and are very difficult to remove. FFS's proprietary technology has overcome these difficulties to provide a sustainable and environmentally acceptable process that allows for the further recovery and utilisation of a valuable resource.

"This is a tremendous breakthrough," says FFS General Manager for Marketing & Supply, Petrus Scholtz. "Being able to reduce the ash content in used lube from 0,6%



▲ De-ashed Lube Technology at FFS Pietermaritzburg plant.

to below 0,1% adds considerable additional value and makes the product suitable for use in steam boilers". ■

## Working toward level 4 BEE score

**F**FS were very pleased to have achieved a level 5 BEE rating according to Empowerdex and the Government score card and are now working towards a level 4.

FFS's BEE partners, Calulo Petrochemicals, are happy with their investment which has continued to pay dividends, notwithstanding the recession.

"We are very pleased with the resilient performance of FFS over a particularly challenging period and are proud to be associated with, and invested in this most capable company," says Mkhuseli Faku the Executive Chairman of Calulo.

"Our social investment programmes have also been very successful and gratifying. The READ science libraries have been very well received and the pass rate of the PROTEC students was 98%," says FFS Financial Director, Don Cochran. (See the website at [www.ffi-refiners.com](http://www.ffi-refiners.com) for the full story.) ■

## Cape Town harbour tank farm

**W**ith the shortage of electricity in the Western Cape and the installation by Eskom of several new peaking power generators in Atlantis, came the logistical problem of how to store and deliver sufficient diesel to this Eskom facility.

The answer was to rent FFS's harbour tank farm on the Eastern mole. This 13,5 million litre storage facility can receive fuel from the local refinery via pipeline and by ship from the wharf. The facility has the ability to load out two 36 000-litre road tankers per hour and so deliver fuel to Atlantis at a rate of 1 728 million litres per day.

As the diesel could sit in the tanks for extended periods, there is also a series of water coalescers and filters to keep the diesel in peak condition. The first 5 million litres were taken into storage in February 2010 and the first 1,5 million litres delivered to Atlantis.

As this was an integral part of the FFS Cape operation, a rental extension has been asked for and granted by the National Ports Authority. On this additional piece of land FFS intend to construct a further three 2,5 million litre tanks. The design and EIA are underway with a target for completion by the end of 2011. ■

# FFS expands into UK market



◀ Don Hunter (MD FFS) and Paul Waine (MD Re:Group) in front of a newly branded tanker

**F**FS recently concluded the purchase of a significant minority stake in the UK company Re:Group (UK) Ltd, a business processing and selling industrial heating fuels. Re:Group are based in Hull, England and are in the same business as FFS South Africa, recovering, processing and marketing heating fuels.

The events leading up to this decision revolved around the EU direc-

tive on waste resulting in restrictions on the burning of waste fuels and the UK's Quality Protocol to allow the end-of-waste de-classification of waste oils by processing to a specification. This specification limits the total ash content to less than 0,2% by mass as well as placing limits on specific metals and chlorine. With the introduction of FFS Refiners' proprietary De-Ashed Lubrication technology (DAL), Re:Group will be

able to meet the new legal requirements on processed used lube oil.

England is a huge generator of used lubrication oils and a world leader in their recovery. Re:Group Managing Director, Paul Waine, saw the strategic benefit of FFS's experience and technology to position his company to take advantage of the new situation, and enable him to continue growing Re:Group beyond the new legislation.

The new FFS DAL plant will enable Re:Group to produce up to 36 000 tonnes per year of a quality Processed Fuel Oil (PFO). The advantage of the FFS process is the 99% recovery of oil and the less than 1% by volume of solid waste produced. The average ash content of the final product produced by the DAL process is <0,1% by mass, making the product suitable for boiler fuel applications. ■

## Donner und blitzen!



▲ This stunning photo of lightning over FFS's Evander plant was taken last year by Paul Andrews of Protect-O-Burn.

# FFS services the queen

**I**t was a case of beauty and the beast, when the mighty Queen Mary 2 arrived in Durban. The beauty was that FFS were able to remove the oily slops from this 151 000-tonne beast and issue a certificate of safe disposal.

Cunard Lines, being the responsible citizens that they are, ensure that they comply with the marine pollution prevention agreement (MARPOL) by not discharging effluent at sea. Luckily, FFS were on hand to provide this service and also to ensure that this waste is recycled



and utilised as a valuable energy source.

This is achieved by re-refining the oil, removing the water and solid contaminants and processing it into a useful low-sulphur industrial burner fuel. The collection required a well

▲ The photograph shows a 42-tonne FFS road tanker dwarfed by the 151 000-tonne 17-storey vessel.

organised and co-ordinated team to connect the hoses, and pump the slops overboard from the vessel in a safe and responsible way. This majestic ship was scheduled to be in Durban for only nine hours before departing for Cape Town. ■

## New faces at FFS



▲ Heinrich Erxleben recently graduated with a BSc. in chemical engineering and was appointed as Process Engineer for the FFS plant in Pietermaritzburg.



▲ Gary Webster is a professional engineer with a BSc. Mech. Eng. He was appointed Engineering Project Manager based at the FFS head office in Durban.



▲ Paul Candow is the new Transport Manager for the KZN region with a long history of experience in the transport industry.



▲ Matthew Bronner was appointed Plant Engineer for the Durban plant, having recently graduated with a BSc. in mechanical engineering.

## Retired after long service to FFS

• Jan levers, accountant, based at the Durban head office, retired after 25 years with FFS. Jan, husband Tony and their two beloved dogs have joined their family in Australia.

• John Warland was the FFS transport manager based at the transport workshop in Durban. He has finally retired after working for FFS for 21 years, plus several more years after retirement, and has returned to the UK with his wife Wendy.

• Mike Young has retired after 15 years with FFS. He was the marketing manager for the Cape region since its inception in 1994 and helped grow the branch from a very small base into the relatively impressive size that it is today. ■

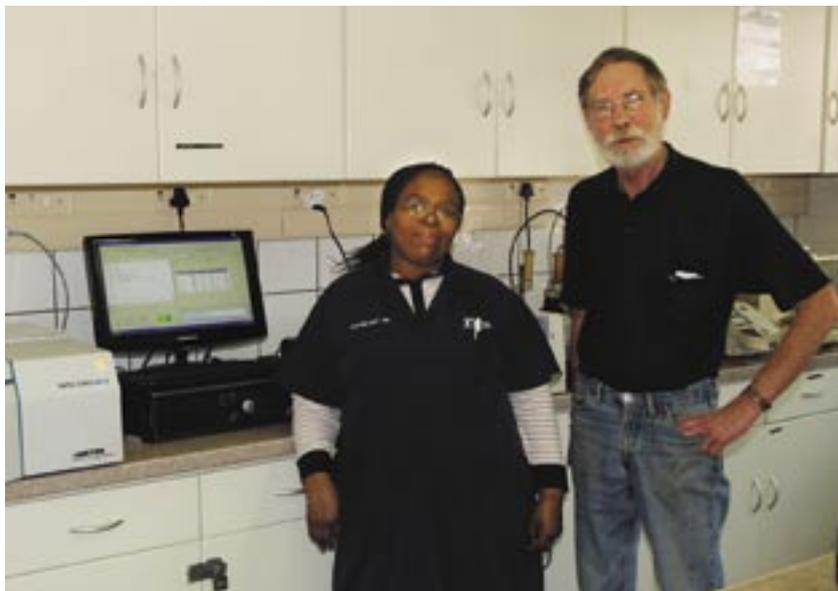
# Tracking contaminant reduction

**F**FS Pietermaritzburg recently purchased a Spectro IQ X-Ray Fluorescence Analyser (XRF).

This state-of-the-art instrument allows measurement of a range of inorganic elements (from sodium to uranium) in all liquids and solids with little or no sample preparation.

It has detection limits in the low ppm's for the bulk of the elements and can give highly accurate results in less than 5 minutes per sample.

They are currently routinely using the instrument to measure the levels of sulphur, chlorine and metals



▲ Chemist Alan Passmoor and Analyst Barbara Ndlovu using their new XRF analyser.

from the various additive packages in the used and reprocessed lubricating oils.

The accurate, immediate results

provided by this instrument mean that they can easily track the reduction of these contaminants through their various refining processes. ■

# FFS goes remote

**W**hen fuel consumption is high, storage capacity is low and the supply chain long, the nightmare scenario of running out of fuel can become a reality unless a proactive management system is entrenched.

Fuel management and logistics is often an underestimated activity that can reveal a company's Achilles heel. This is the reason that FFS has introduced remote tank level telemetry on their customers' storage facilities.

The FFS Remote Telemetry System addresses this problem. This web-based system allows selected personnel access, via the Internet, to tank levels, and shows a graphic history of tank level movements and alarms. The powerful alarm function will alert specified personnel by SMS or e-mail of any change, rate of change, maximum and /or minimum, ensuring that there is no time lost in ordering and prioritising new loads of fuel.

FFS partnered with a local company, Omniflex, who are leaders in remote monitoring applications. The result of this partnership produced a state-of-the-art GSM-GPRS telemetry module. This allowed for reliable, fast and cost-effective transmission of data using cellular phone networks.

FFS have a dedicated logistics manager, Deva Reddy, who monitors the activity of these units and manages the ordering and transport function, ensuring that priority loads actually arrive on time.



▲ Mark Butterfield with one of the telemetry units to be installed at a customer's facility.

The telemetry units are also being used to monitor FFS Refiners' own steam boilers. A telemetry unit monitors the operating conditions including steam pressures, stack emissions, TDS, blow-down intervals, feed water temperature, etc.

If, for example, the steam pressure drops, or a low water condition is detected, an SMS is sent out to the maintenance department so that corrective action can immediately be taken. If the condition continues, then the alarm is escalated and sent out to the next senior level prompting further action.

With the historical charting function, efficiencies and plant availability can be monitored and controlled. This saves time and money. ■



## Head office grows

▲ Due to ongoing company growth, space was at a premium necessitating an expansion. The new wing included a new entrance and office space for an additional 25 people. Above is part of the additional secure parking space for visitors and staff.



▲ FFS Pmb Bulking Depot for reception of used lube.

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[www.ffa-refiners.com](http://www.ffa-refiners.com)

## FFS venture thrives in Australia

**T**ransPacific Refiners, FFS's joint venture in Australia, have reached some new milestones. The plant processed 18 million litres of used lubrication oil for recycling back into base oil in the past year. The plant has produced 2,6 million litres per month but is currently constrained by the lack of suitable feedstock.

The quality of the product is excellent, with a colour of 1,0 according to the ASTM method; less than 10ppm of total metals and very stable. This Solvent-Neutral 150 product has been readily snapped up by the market.

The plant has been at the forefront in developing new catalyst regimes for optimal quality and catalyst life, as well as in material selection where use has been made of the new duplex steels that are now available, to reduce corrosion. ■

## New ROSE depot will assist lube collectors

**T**he ROSE Foundation has been rolling out a network of bulking depots for the accumulation of used lube in areas away from the main centres. This allows small collectors to use LDVs with one-tonne flow bins to effectively and efficiently recover used lube oil from service stations in their areas.

The problem was that establishing a legal storage depot is an onerous undertaking but necessary to bulk up the lubes for transport to a processor in large tanker loads.

The used lube oils collected in the Natal Midlands were being transported to the ROSE Depot in Durban and then transported back to FFS's process plant in PMB. To save on all that unnecessary transport, FFS and ROSE put up a bulking depot in PMB.

This facility was recently opened at a function attended by ROSE members. Collectors can now deliver small loads daily to the facility. ■