

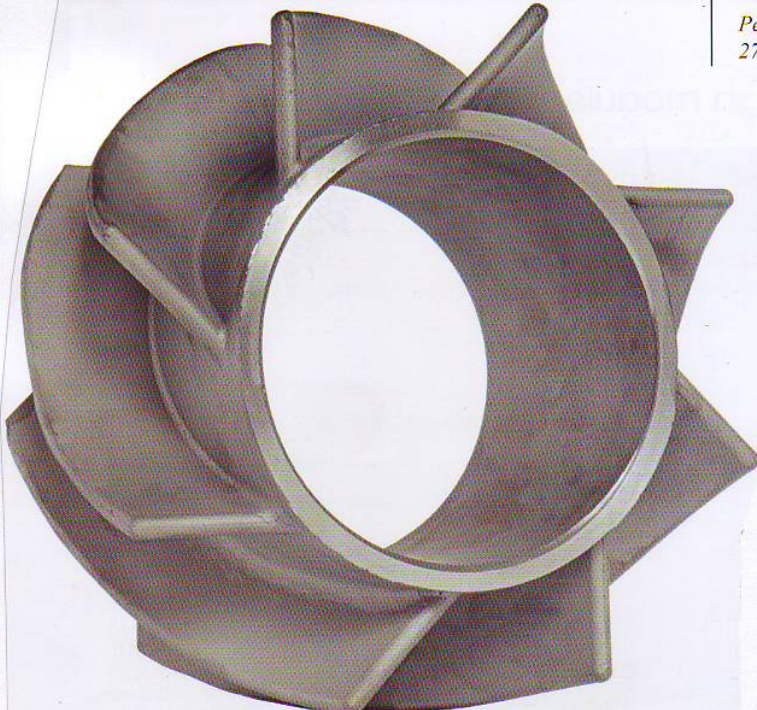
### High-tech licence

Local engineering company, PSV Services, is to manufacture swirl tube separator assemblies under licence for Shell Global Solutions International.

The assemblies are central to Shell GSI's highly effective third-stage separator (TSS) technology, widely acknowledged as the foundation of effective flue gas emission management in the fluidised catalytic cracking (FCC) process used by oil refineries worldwide.

FCC processes making use of the technology are able to reduce atmospheric particle emissions to less than 50mg/Nm<sup>3</sup>. Strict quality controls are a characteristic of all TSS swirl tube separator manufacturing processes.

Only after a factory inspection confirmed the PSV Services' advanced manufacturing procedures and very high quality standards, was the manufacturing licence awarded by Shell GSI. The inspection took place in February.



Swirl tube separator assembly

Primarily a supplier of pumps, pump spares and valves to water and slurry operations at mines throughout Africa, PSV Services' experience with large, reputable multinational companies promises a good fit with Shell GSI.

The latter company developed TSS technology in the 1960s to complement two-stage FCC regenerator cyclones as an additional stage in refinery particulate removal, protecting downstream turbo machinery used for energy recovery.

As such the third stage separator is acting as protection for the expander blades of the power recovery unit turbo machinery and other downstream components, and prevents wear and tear by the very erosive fine catalyst particulates.

Ongoing research and design improvements have since extended applications to include environmental particulate emission control.

The separation efficiency depends particularly on the internals of each TSS, which comprise the swirl tube separators to be manufactured by PSV Services.

Axial-flow swirl tube vanes within the separators generate a spin velocity fast enough to separate the fine particulates from the flue gas, discharging them to a hopper while the cleaned flue gas reverses direction and flows to the TSS top discharge outlet via the central outlets of the individual swirl tubes.

Vane shape, alignment and finish are essential contributors to effective TSS swirl tube performance.

Cast in 304H stainless steel, the accuracy of the swirl tube vanes is in turn dependent on the quality of patterns and moulds, aspects of manufacture to which Shell GSI paid particular attention during the inspection in February.

PSV Services' licence agreement with Shell GSI is expected to lead to other high specification contracts with multinational customers.

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