



The MegChem way: long-term support well beyond project scope



African Fusion visits MegChem/SecMet in Centurion, Pretoria and talks to Andrew Seebregts, the company's principal welding engineer, and Ronald Koenis, business unit manager for metallurgical engineering.

dent company. This gives us the distinct advantage of being able to focus more widely on metallurgical quality and forensic work, with MegChem focusing on the mechanical and project engineering side of the business," he informs *African Fusion*.

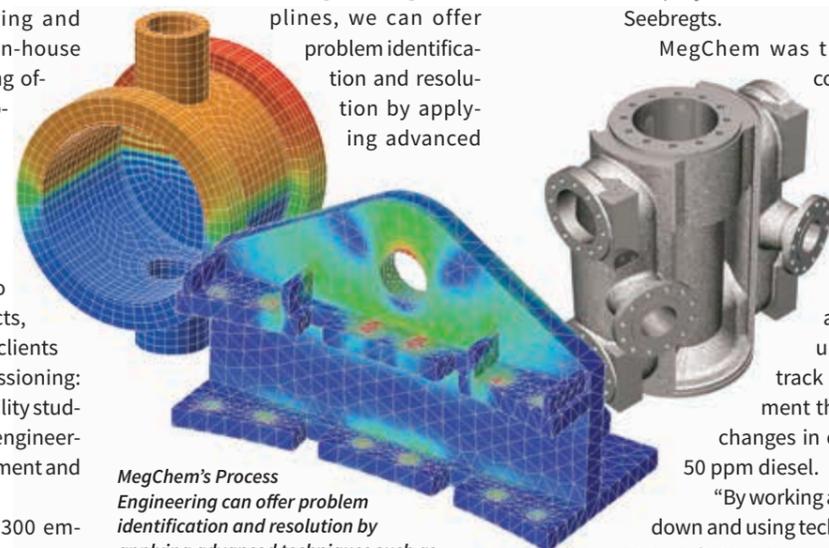
MegChem's offering and successes
MegChem's primary expertise is mechanical, process engineering and project management. "Our in-house mechanical and piping drafting offices can produce detailed fabrication drawings, isometric drawings and process flow sheets for both refurbishment and new-build projects," says Seebregts.

"MegChem has the ability to execute EPC and EPCm projects, from a brief provided by our clients and all the way up to commissioning: conceptual engineering, feasibility studies, basic engineering, detail engineering, specifications and procurement and construction. –"

"We have approximately 300 em-

ployees on board, of whom 80 are qualified engineers with more than 1100 man-years of engineering experience between them," he notes.

Due to its roots, MegChem's Process Engineering and Design services for the petrochemical and chemical industries is particularly strong. "As well as front-end process design and integration across engineering disciplines, we can offer problem identification and resolution by applying advanced



MegChem's Process Engineering can offer problem identification and resolution by applying advanced techniques such as 3D CAD, finite element analysis (FEA) and fatigue analysis.

techniques – finite element analysis (FEA); fatigue analysis and much more." Seebregts continues.

"We have significant experience in process plant and equipment design and we offer one-stop, phased-approach project execution, which includes commissioning assistance," he adds.

Facilities for developing and draughting engineering flow sheets and process diagrams – process flow (PFDs), mechanical flow (MFDs) or piping and instrumentation (P&IDs) diagrams – are all available and, with respect to business support, MegChem's process teams can assist clients through conceptual process engineering studies to the development of new processes and products or the upgrading and op-

timisation of existing plant with respect to efficiency and throughput.

"Our plant support activities include rendering process engineering services to the mechanical engineering, maintenance and production functions within a company and generating ideas and defining requests," he says.

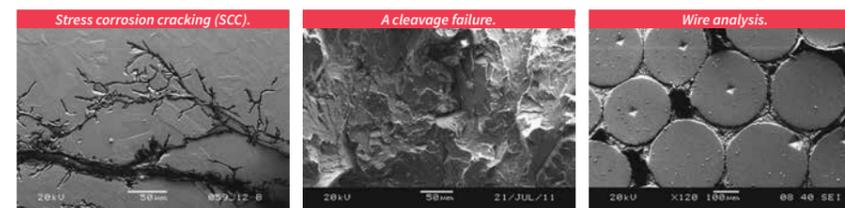
A few of many notable projects include Reactor replacements, column renewals, storage facilities, gas clean-up facilities and other plant improvements that added value to our clients' business.

"We have also completed a highly successful turnaround at the Chevron refinery in the Western Cape, in which we managed the complete scope of work for the projects at the refinery for and on behalf of our clients. Chevron contracted MegChem to take full responsibility for the projects on an EPCm basis," says Seebregts.

MegChem was the engineering contractor for four major upgrades at the refinery: the fluid catalytic cracking unit (FCCU), replacing the Texas tower and the crude column, and for a fast track project to implement the required plant changes in order to produce 50 ppm diesel.

"By working ahead of the shutdown and using technologies such as high-definition laser scanning to model the existing plant work areas, and then fabricating replacement components in advance to perfectly integrate during installation, the turnaround time on the entire upgrade was completed within the shutdown window," he notes, adding that as well as the scheduled work, unexpected modifications were also accommodated within the required timeframe.

The fabrication work for the Chevron upgrade was done at a number of fabricators, with the critical fabrication work performed by fabricators certified to ISO 3834. "As per some client requirements across the petrochemical industry, we tend to prefer using ISO 3834 certified welding fabricators. The quality of the welding on refineries and petrochemical plants is critical," Seebregts adds.



A state of the art scanning electron microscope (SEM) enables accurate identification of failure mechanisms, metallographic structures, and corrosion products.

FFS, RLA and forensic services

Describing SecMet's role within the MegChem Group, Koenis says that process plants and equipment are increasingly being used for extended periods, often well past their original design lives. "There is, therefore, a growing need to monitor and confirm continued fitness for service and remaining life of critical equipment. SecMet is very well placed to fulfil this need, based on globally accepted practices," he says.

"Our strong metallurgical and materials engineering background, combined with state-of-the-art structural modelling and testing capabilities, enables us to offer world-class fitness-for-service (FFS) and remaining life assessment (RLA) services," he tells *African Fusion*.

Starting with theoretical and practical knowledge of the degradation processes involved, combined with knowledge of materials and structural behaviour, SecMet is able to establish if continued plant operation is feasible and safe.

Typical projects have focused on pressure vessels, tanks, rotating equipment and high-temperature applications. "A recent success in the Middle East established that two large and ageing pentane tanks were fit for continued service, provided that certain recommendations be followed," he says, adding that "life extensions such as these can save operators enormous amounts of money".

SecMet's Materials and Forensic Engineering Division also offers a comprehensive metallurgical consulting service encompassing all aspects of physical metallurgy, materials engineering, welding and corrosion. "Our metallurgical experts are supported by a well-equipped metallurgical laboratory and an ISO 9000 certified testing facility, which enables us to provide a one-stop metallurgical service to the petrochemical, mining and manufacturing industries. This includes advanced failure investigations and integrity studies and all the way down to basic material testing and certification," Koenis says.

A state of the art scanning electron microscope (SEM) enables accurate identification of failure mechanisms, metallographic structures, and corrosion products and, "due to our history and close co-operation with the petrochemical industry, we can offer specialist capabilities in the field of corrosion engineering, testing and monitoring, as well as plant integrity and risk-based assessment and inspections," he adds.

SecMet also offers forensic engineering investigations to establish the cause and sequence of events leading to accidents or failures. "This work is used by the legal profession for both civil and criminal court proceedings," Koenis notes, adding, "forensic engineering is also often used in investigations with a commercial or industrial focus, to attribute responsibility in event of a dispute, for example.

"We combine specialist knowledge of materials behaviour, stress, structural analysis and failure to determine the root cause of a failure. In so doing, we rely on state-of-the-art techniques and software, along with the extensive experience of our people," he notes.

From a welding engineering perspective, he adds that SecMet also offers a comprehensive range of quality and other services to fabricators and plant operators, including: developing welding procedures specifications (WPSs) and welding procedure qualification records (PQR); coding and qualifying welders; developing heat treatment procedure; and investigating and solving welding related problems.

"Through MegChem and SecMet, we strive to add value to our clients' businesses by taking ownership of a job and applying innovation, creativity and sound engineering and business practices," says Koenis.

Seebregts concludes: "We strive for excellence in everything we do. We pride ourselves on providing long-term maintenance and support, well beyond installation and the implementation of our project scope and, often, even beyond the design life of a plant." ■



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