THE ENERGY ENGINEERS

Pictured this page (clockwise from top left): Pemex-Gas compression scrubbers installed on Combisa EPC-22 offshore platform in Gulf of Mexico;

Petro-Canada-TDE manufactured glycol regeneration modules assembled in TDE yard;

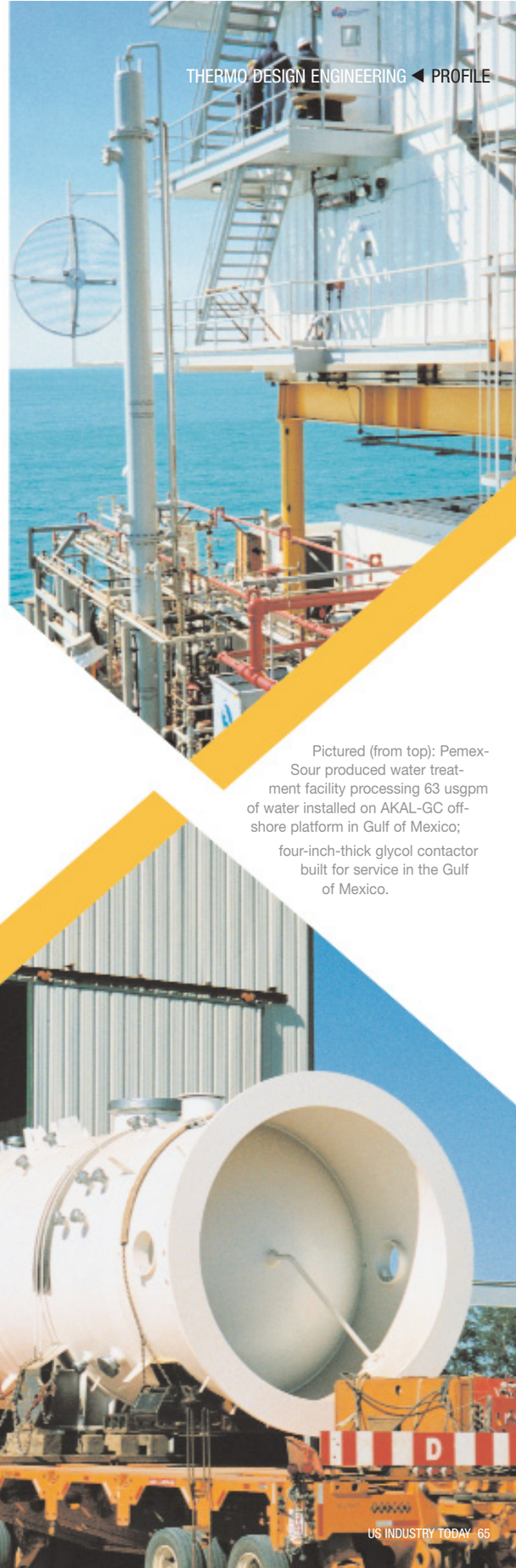
Pemex-Sour gas TEG dehydration facility processing 250 mmscfd of natural gas installed on AKAL-GC offshore platform in Gulf of Mexico.

WHEN A METALLURGICAL ENGINEER GETS TOGETHER with a mechanical engineer things are bound to get interesting. That's exactly what came of the meeting between Jim Montgomery, current president of Thermo Design Engineering, and Tony Rojek, the company's senior vice president. The two men first met in Edmonton at a company called BS&B, an oilfield production equipment manufacturer founded in Oklahoma in the1930s.

The enterprising engineers decided to combine their engineering backgrounds and start Thermo Design Engineering (TDE), a company geared toward producing natural gas processing equipment and the new entity opened its doors in 1979. Montgomery and Rojek located the company in Edmonton, Alberta, Canada and focused on the natural gas processing equipment market through much of its first decade of business. The company became extremely good at process design and building complete systems and by 1992 it had started to earn a reputation and branched out into Russia, Siberia and China where it continues to work today.

Since then, Thermo Design Engineering has blossomed into one of the leading engineering companies specializing in petroleum and petrochemical process systems. "We believe every engineering challenge demands a solution," says Jim Hornett, Canadian sales

SPECIALIZING IN THE ENGINEERING, FABRICATION AND CONSTRUCTION OF NATURAL GAS, PETROLEUM AND PETROCHEMICAL PROCESS SYSTEMS, THERMO DESIGN ENGINEERING HAS CREATED A MIGHTY NICE NICHE FOR ITSELF IN THE PROCESS DESIGN AND SYSTEM MODULARIZATION ARENA. PAT WHITEMAN HAS THE STORY.



Pictured (from top): Pemex-Sour produced water treatment facility processing 63 usgpm of water installed on AKAL-GC offshore platform in Gulf of Mexico;

four-inch-thick glycol contactor built for service in the Gulf of Mexico.

manager for TDE. "We have the ability to work in all kinds of climates – really hot to really cold and everything in between. We're also extremely versatile. TDE can be one part of the solution or it can manage the entire process, from feasibility study to start up. Our solutions can stand alone or services can be combined into unique custom configured packages."

Of the company's 250 employees, 90 are focused on the design side of the business, while the remaining 150 or so are involved in fabrication. TDE has five shops on 16 acres of land, each one devoted to a specific process. Its fabrication shop is a spacious 27,000 square feet and its modular assembly plant is about 15,000 square feet. A structural shop offers up to 25,000 in square footage and a paint shop and sandblasting facility each have 10,000 square feet of workspace. The 90,000 total square feet of manufacturing space is upgraded continually through capital investments and other additions and TDE is currently focused on upgrading its computer system so it can communicate effectively with its growing number of overseas customers. TDE also has sales offices in Poland, China and Iran.

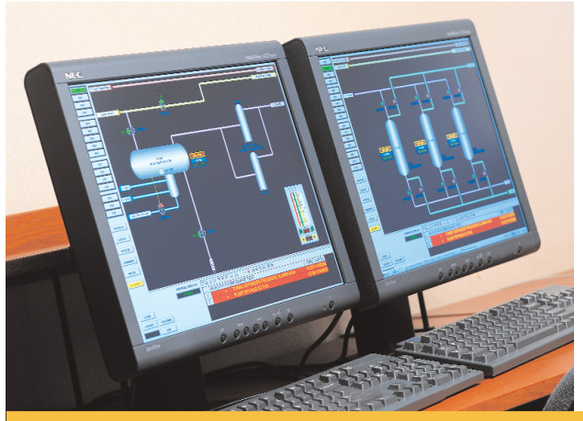
MAKE IT MODULAR

The biggest change in the process design business over the years has been the push toward modularization of equipment. "That was a trend we saw coming on strong in the 1980s," says Hornett. The modular concept is especially attractive in that it offers substantial cost savings compared to traditional onsite construction methods. According to Hornett, TDE design and fabrication is conducted in a very controlled environment that permits rigorous quality assurance and rapid delivery. "Alberta is now a world leader in this kind of construction," says Hornett. "Because of peculiar and extreme weather conditions here we're uniquely qualified to construct these systems for climates with similar conditions. Plus, it's a lot easier and economical to build it in Edmonton and ship it rather than build onsite. Shop fabrication is just much more economical than site fabrication."

TDE's modular concept is ideally suited for remote installations. All of the major equipment and associated systems are configured and assembled onto prefabricated structural steel skids. These skids are in turn sized in accordance with local transportation restrictions and requirements. The skidded components or modules are then shipped to the job site where installation and commissioning can take place in a matter of weeks.

TDE is currently working on several large projects, two in Iran and one more in Turkmenistan. "We have very little work going on locally. Since 1991 most of our work has been out of the country. Canadian manufactures are generally extremely competitive world-

Pictured above: TDE packaged Nuovo Pignone hydrogen compressor; below: control system for 320 mmscfd cryogenic plant utilized Siemens PLC with a TDE developed human machine interface using Win CC on Windows 2000 in Russian and English.



wide and our margins are higher with overseas work," says Hornett. The company has recently completed projects for the National Iranian Gas Company, Turkmen Gas, Petrobras of Brazil and the Chinese National Oil Company. This modular technique is also used on offshore platforms where TDE has supplied equipment to the Gulf of Mexico for Pemex and offshore Newfoundland.

ENGINEERING PROWESS

TDE's principal asset is the knowledge and experience of its people. Many of its senior staff members have over 30 years experience in the design, manufacture and installation of process systems.

TDE has the ability to provide accurate process and mechanical design parameters and provides its clientele with the most flexible and economic design and project execution. It offers a full array of services including: project management, feasibility studies, process design engineering, equipment design, procurement and fabrication, site construction, supervision, commissioning and start up, and personnel training.

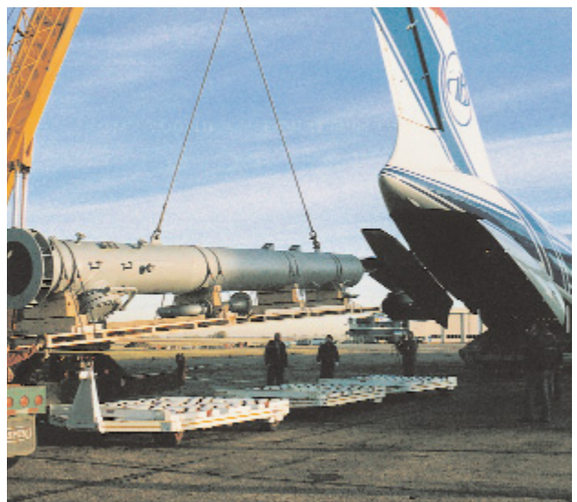
Its engineering services include: conceptual design verification, which is a review of the overall project with participation of all engineering disciplines and includes a HAZOP review of the control scheme. It also offers detailed process design, P&ID preparation, equipment sizing confirmation, module layout and piping design, mechanical design, electrical design and specification, buyout equipment specification, instrumentation valving control system specification and purchasing. Complete fabrication services and testing services are also available.

Most importantly, TDE offers full-service installation of every system it creates.

It is fully experienced in all phases of the crating and shipping process and its onsite mobilization process ensures all tools and

Pictured above: The Yakutsk gas plant process, electrical and pipe rack modules were shipped from TDE and installed during the short Siberian summer. The equipment was designed and manufactured for Russia's severe Siberian climate using proven northern Alberta technology;

below: to satisfy the client's stringent delivery schedule and first gas date, the equipment was shipped from Edmonton, Alberta to Poland aboard a Russian Ilyushin-76TD cargo plane.



equipment are available for the most flexible and economic project execution. Upon installation, TDE has the most qualified supervisors assigned to the project to direct all phases of construction and installation of modular assemblies

The company also has an exclusive worldwide license for the Clean Soil Process (CSP). This process was jointly developed by TDE and the Alberta Research Council in Devon, Alberta, Canada to treat soils contaminated with hydrocarbons, heavy metals, and chlorides. TDE formed TDEnviro (TDV) in 1994 to develop the CSP technology.

NEW ENERGY SOURCES

With its tried and true processes and design techniques firmly in place, TDE is always looking to other areas where its expertise might be of use. " We're interested in the area of environmental and waste energy," says Hornett. "We haven't built any projects yet but we've been talking to a number of people in this area. Natural gas is so expensive that there is a push to develop different ways to access it. We have some licensed technology and have been approached by a company in this area, so it's definitely something we're keeping an eye on."

Another thing TDE is keeping an eye on is the Athabasca tarsands in Alberta, potentially the largest known oil reserve in the world. "This is an extremely oil rich area, it's just not easy to get out of the ground," explains Hornett. "And the large deposits of bitumen or tar in the final product make it tough to deliver a clean end product. A lot of major players in the gas business have come to this area to invest and we're definitely keeping close watch on the tarsands."

Pictured above: Pemex-Gas compression suction, intersage and discharge scrubbers installed on AKAL-GC platform in the Gulf of Mexico.

Pictured below: Pemex-Flare knockout vessel installed on AKAL-GC platform in the Gulf of Mexico.