



Propak is Energy Processing

CORPORATE RESUME



Propak is Energy Processing

Unmatched record of creating value for our clients from their energy resources through integrated, comprehensive energy processing solutions. A culture of innovation, of integrity in business, and of maximizing value for the end user.





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MAXIMIZING END USER VALUE

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Propak's ability to provide our clients with fully integrated, in-house, turnkey EPFC execution facilitates effective communication increasing efficiency, productivity, and value.

ENGINEERING

PROCUREMENT

FABRICATION

CONSTRUCTION



“Propak builds innovative solutions that create value for the energy processing industry worldwide.”



Message from the President

Propak Systems Limited provides innovative solutions that create value for the energy processing industry worldwide.

We are a large engineering and design firm with comprehensive energy processing experience and an international network of multi-disciplinary engineering, technical and business professionals. We are also one of Canada's largest manufacturers of energy processing equipment, modules and plants with a large skilled labour force in fabrication, construction and field service.

Propak is a private Canadian corporation owned and operated by its senior management. Customers benefit from an organization that is large and diverse, manages projects efficiently, and has the flexibility to provide a hands-on approach to a client's needs with a single point of accountability.

For over 45 years, we have built a reputation for outstanding client service, integrity and reliability. Our unique integration of engineering skill and fabrication capabilities combine to create maximum customer value through fit-for-purpose design solutions, reduced capital costs, reliable project execution, and industry leading product performance.

Propak's signature ability to design and construct both large turnkey processing facilities and individual processing units on modular, shippable skid mounted packages sets us apart. Our modular expertise, standardized designs, and combined engineering and fabrication capacity give us the ability to accelerate the schedule to completion on a fast-track basis.

We are built to undertake any part of our client's project execution strategy for an energy processing solution: evaluating the opportunity; selecting the best alternative; defining the best plan; executing the complete energy processing project from front end engineering studies through to commissioning, start-up and after market support services. We undertake any of these services separately, or we create integrated, turnkey solutions from concept to start-up and operation.

We continue to expand our ability to meet our customers' requirements for innovative energy processing solutions through our Compression and Power, Natural Gas Processing, and Heavy Oil Processing business units. Our Innovative Steam Technologies (IST) business unit further expands Propak's product line providing our customers with complete modular OTSGs for Heat Recovery and Steam Generation applications. Our Stock Equipment boasts a wide line of standard packages for gas processing, gas treating, and compression and power generation which are built to meet both domestic and international industry standard specifications. Our Engineering, Modular Fabrication, Construction and After-Market Services units provide the expertise required to create, build, expand and operate energy-processing facilities.

Propak is an industry leader in Canada and internationally, focused on maximizing value for our customers through the creation of high-return energy processing solutions. We believe that individual attention to every job, technical innovation, quality craftsmanship and fulfilling our promise to deliver on schedule and on budget are the keys to our success.

Rod McPike
President

The Propak Advantage

By leveraging the Propak advantage, end users of Propak's energy processing systems create maximum value from hydrocarbon resources. Our highly integrated approach consistently generates exceptional solutions for the technical requirements and business goals of our energy processing clients.

Propak's core business is to create total "Engineering, Procurement, Fabrication and Construction" (EPFC) solutions for the energy processing industry. Propak constantly strives to grow its culture of expertise and technical innovation, of integrity in business, and of dedication to the creation of value for the end user.

Advantages that Differentiate us from our Competition

First, Propak's engineering expertise regularly produces innovative technical solutions that **exceed our clients' expectations for engineering design and product performance**. We apply advanced engineering and design solutions, including proprietary Propak technologies. Our engineering goes further, achieving our customers' goals from concept to operation in an integrated process.

Second, whether you engage us to provide a single processing unit or a complete processing plant, you gain the benefits of our **highly integrated EPFC turnkey model**. Our singular experience creating turnkey EPFC solutions forms a distinct advantage for our clients.

Propak's fully integrated approach achieves increased client value at every stage. Our first-rate engineering and design expertise helps you evaluate your concept and make decisions with the highest level of insight and certainty available. We coordinate across multiple time zones and locations, create an integrated plan for execution, achieve a fit-for-purpose design, expertly fabricate and construct, and successfully bring your turnkey plant into operation. We give you a single point of accountability, with consistently high standards and the tightest possible overlapping schedules.

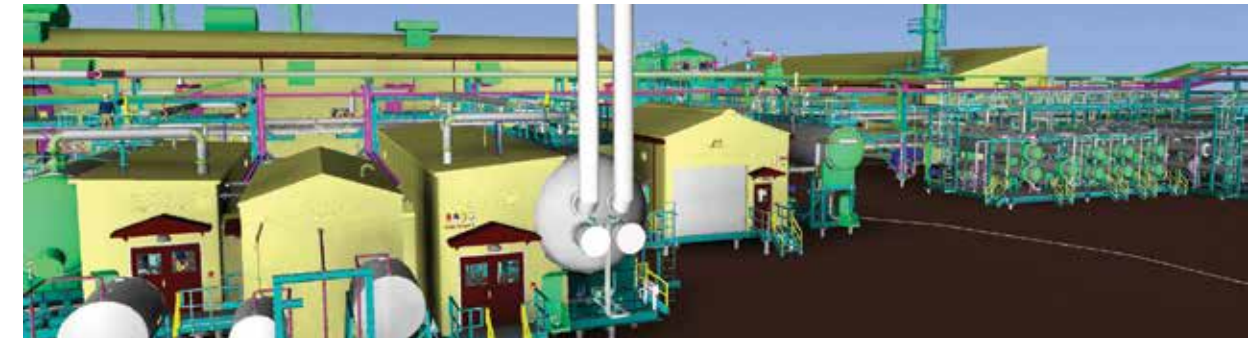
Third, Propak leads the worldwide energy processing industry in its ability to provide **technologically advanced, completely integrated modular design and fabrication solutions**. Our unique modular expertise multiplies value for the end user on several metrics: the shortest route to the working product; the smallest practical footprint; cost, time, labour and quality advantages through minimized field construction and warehousing; and logistical advantages that allow us to construct plants around the world in remote locations and severe conditions.

Maximum Value from Hydrocarbon Resources

Our focus on creating end user value through exceptional product performance, through vertically integrated EPFC, and through modular design and fabrication expertise, produces **unrivalled value creation and cost certainty**. Propak's preferred execution model allows us to give our clients the confidence of single sticker, lump-sum pricing based on a well defined, fixed scope of work. Our pricing model and our integrated approach achieve significant operator advantage by increasing certainty at every stage, from evaluation of concept to full operation.

Whether in an end-to-end custom solution or in a standard package solution, Propak consistently beats its competitors on time to operation.

On every project, we focus our energy to create value for our customers. Propak maximizes the risk-adjusted value of the overall project through completely integrated solutions that leverage our unique EPFC and modular expertise, meeting or exceeding product performance requirements through innovative engineering and design.



Highly integrated Engineering, Procurement, Fabrication and Construction (EPFC) model

The best project execution model available; pre-FEED evaluations and FEED studies flowing seamlessly into detailed design; detailed design integrated with procurement, fabrication and construction management. A single point of accountability. A consistently exceptional standard of quality.



Technologically advanced, completely integrated modular design and fabrication solutions

Advanced process and design solutions with the smallest practical footprint, constructed anywhere in the world, in the shortest timeframe, with minimized field construction and warehousing.



Exceeding our clients' expectations for product performance, value creation and cost certainty

Exceptional product performance. Cost, labour and schedule certainty. Customer-focused solutions to create value through reduction of CAPEX and OPEX and faster time to operation.

Propak Innovations

Propak has a long record of engineering achievements and outstanding product performance. We have built hundreds of gas processing and heavy oil processing facilities and thousands of individual processing units, compression and power generation packages—in more than 60 countries around the world. Our innovations, integrated designs, engineering and modular fabrication abilities continue to maximize value for our customers with fast track project execution and reduced total project costs. Our proprietary and patented technologies are among the best in the world.



Modular Flaregas LPG Recovery Unit on FPSO



Modularized Enhanced Oil Recovery OTSGs



Alberta Sulphur Recovery Unit



1. **LPG Recovery & Fractionation Plant – Tierra del Fuego:** Turnkey, modular Cryogenic Turbo Expander plant, 280 MMSCFD (expandable). 98% propane recovery. 9500 bbl/d C3/C4 LPG. 2400 bbl/d C5+. 17 months for full EPFC to operation.
2. **Gas Processing Plant – New Zealand:** 70 MMSCFD gas processing plant with modular equipment packages designed for international transport and installation in an earthquake zone. Plant consisted of 41 modules which were shipped 18,000 km for final installation.
3. **SAGD Facility – Saskatchewan:** 8,000 bbl/d CPF and Well Pads. EPFC for a series of modular facilities executed with industry leading cost and schedule metrics. Standard, repeatable facility design successfully installed for multiple clients in many different development locations.
4. **Sour Gas Processing & Treating Facility – Poland:** Turnkey 55 MMSCFD sour gas processing plant with oil treating, amine sweetening, mechanical refrigeration, LPG fractionation and sulphur recovery. Super Claus sulphur recovery of 99.1%.
5. **Produced Water Recycle Facility – Saskatchewan:** Expansion of the produced water system on a Propak 8,000 bbl/d SAGD CPF to include an electrocoagulation system. Treats produced water for reuse in steam generation.
6. **Major Gas Compression Project – China:** 59 large, high pressure gas compression packages, with a combined 305,000 hp for all units. High performance, modular units fabricated in Alberta and delivered to locations throughout China in one year.
7. **SAGD Well Pad Expansion Projects – Alberta:** Well pads developed with repeatable, modular units installed on multiple pad locations over a series of expansion phases. Over 100 SAGD wells tied in with standard units in various configurations.
8. **Micro LNG Plant – Hainan Island, China:** Turnkey EPFC design and build, 8.3 MMSCFD Micro LNG Liquefaction Unit supplying LNG for Transportation and storage. Inlet gas treatment achieving <10 ppm carbon dioxide.
9. **LPG Plant – West Virginia:** Full EPFC, modular-built, turnkey 200 MMSCFD Cryogenic Turbo Expander Plant. C3+ LPG extraction with 99+% propane recovery on cost-effective, low OPEX Propak patented process. 10,150 bbl/d C3+ LPG recovery.
10. **Cryogenic NGL Recovery – Urucu, Brazil:** Highly modularized for logistics and for remote field construction 1500 km up the Amazon River. 127 MMSCFD with 98% C3 recovery. Producing 11 MMSCFD C2, 9810 bbl/d C3/C4 LPG, and 822 bbl/d C5+.
11. **Flaregas Recovery LPG Plant on FPSO:** Recovering 2200 bbl/d LPG and 1600 bbl/d condensate from 13 MMSCFD associated gas. Dry dock superstructure assembly of modules, and single crane load onto FPSO at sea.
12. **Gas Compression Facility – North Africa:** A combined 35,000 hp of two and three stage compressor packages installed in a remote location for solution gas injection with modular fuel gas conditioning and power generation.
13. **Enhanced Oil Recovery OTSGs – Saskatchewan:** Propak patented, fully modularized and winterized, SQ90™ Once Through Steam Generators providing steam for EOR facilities. Over 20 units installed and operating at multiple locations providing >90% quality steam.
14. **OTSG with Leading Emissions Control & Flexibility – California:** Highly efficient and flexible OTSG, complete with NOx and CO control, and air dilution. Paired with a 45MW gas turbine, the OTSG limits emissions to the lowest levels in the industry across a wide range of operating conditions.
15. **Standardized Compressor Packages – North Dakota:** Modular 4-stage compressor packages optimized for transport and rapid installation. All valving was incorporated and fully tested in the shop prior to shipping reducing field construction costs. Designed to be re-deployable as field conditions change.
16. **Offshore Combined Cycle OTSGs – Gulf of Mexico:** Four compact, lightweight, single pressure OTSGs complete with duct firing capable of producing 440,000 lb/hr of high pressure steam. These units are key components of one of the first ever offshore combined cycle systems to be implemented by a world leading oil & gas company.

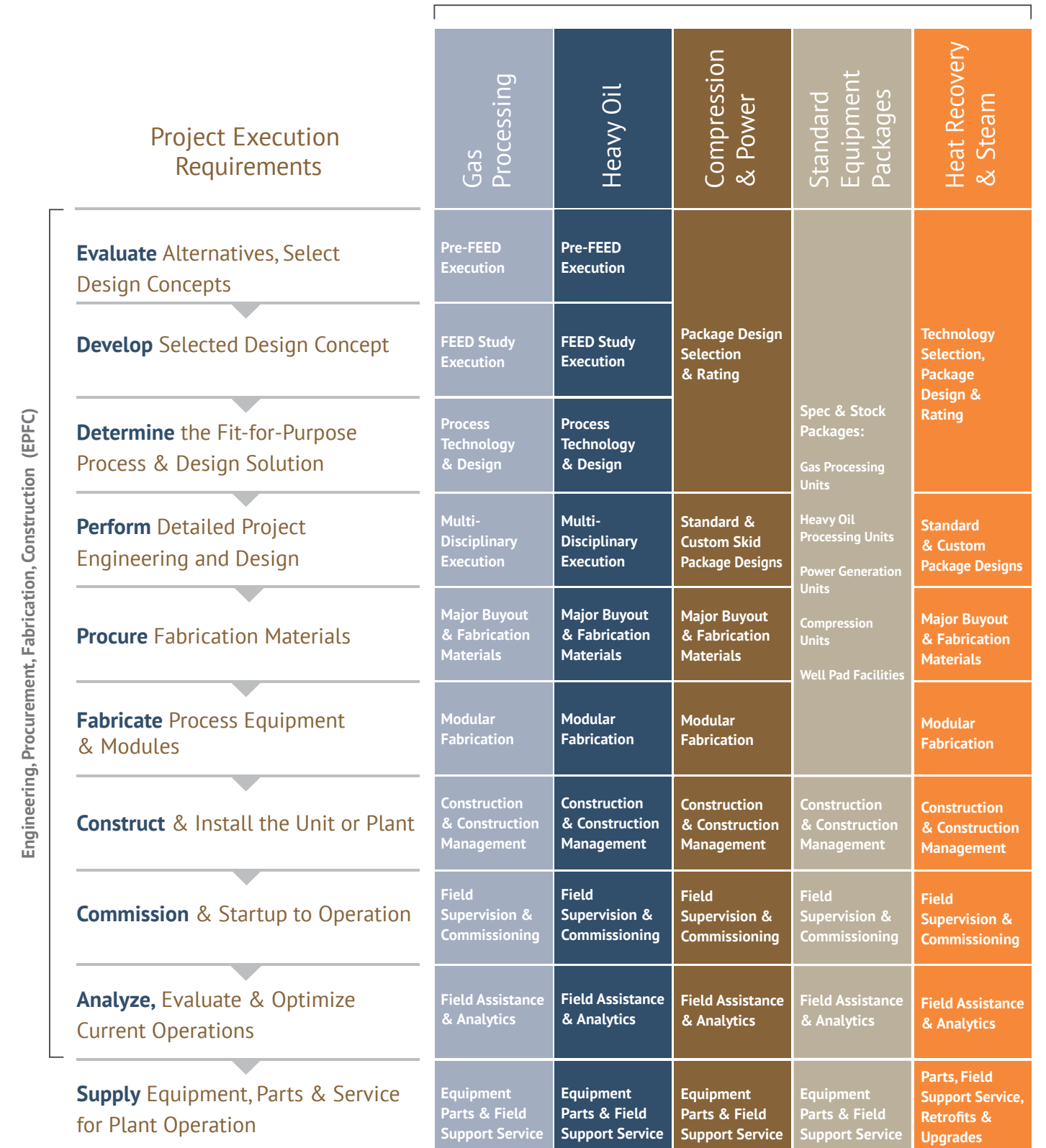
Propak is Energy Processing



Propak provides comprehensive solutions to help our clients meet their project execution strategy by designing and building energy processing facilities and equipment. We are the experts in gas processing and heavy oil processing. We are a large-scale fabricator integrated with a full-service international engineering company. We provide complete energy facilities and individual process units. We are a design and build firm together with an energy services company that engineers, constructs, commissions and services energy processing equipment and plants.



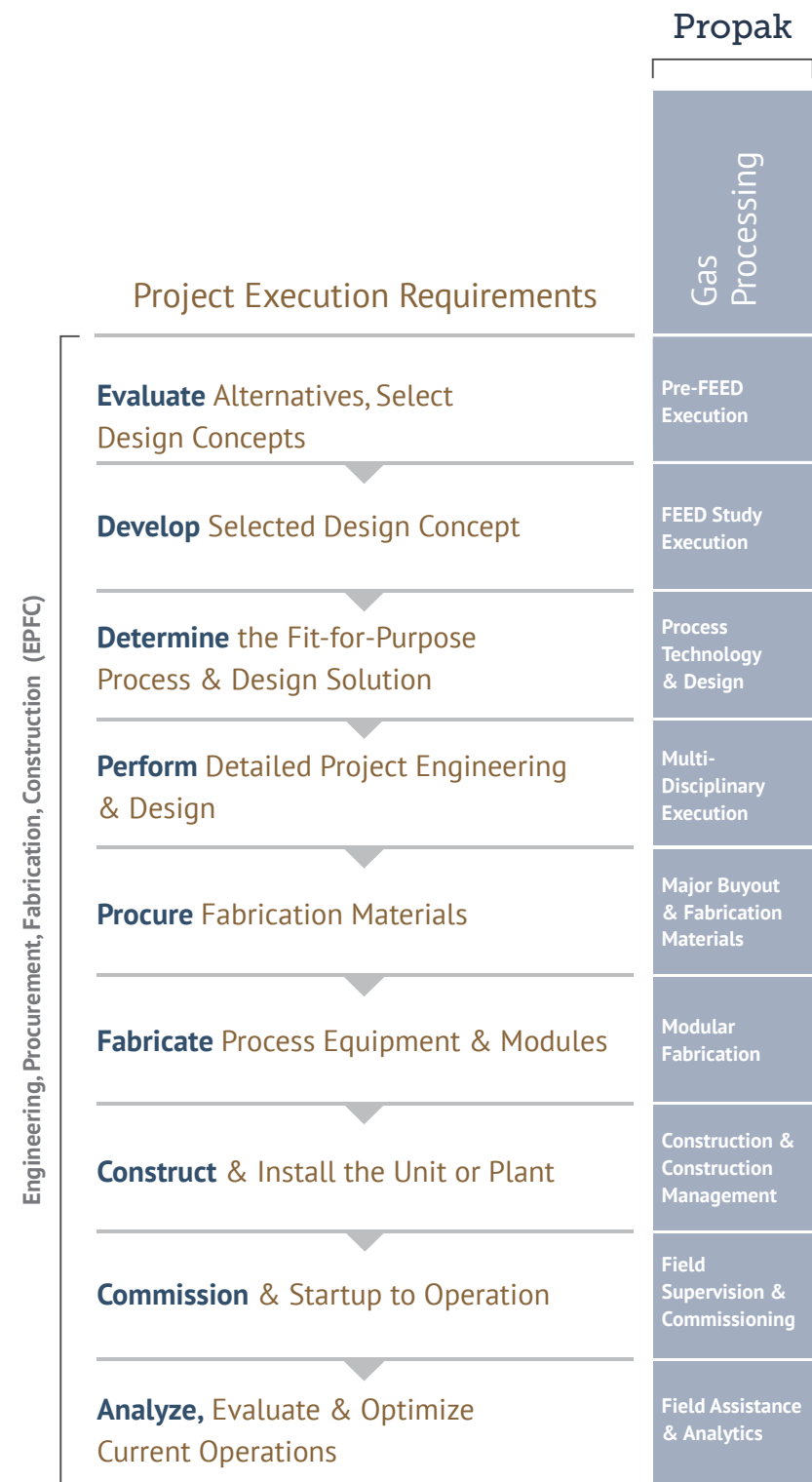
Propak



Propak is Gas Processing



World-class product performance and fit-for-purpose engineering and design. We are an international leader in cryogenic turbo-expander technologies. Our proprietary NGL and LPG technologies, including Propak's patented UltraTEF LPG process, allow us to extract natural gas liquids with the highest efficiency and the lowest specific power requirements in the industry. We provide comprehensive services from well-head to sales pipeline, including: front-end engineering studies, detailed design, engineering, fabrication, construction, commissioning and start-up support. We build complete turnkey gas processing facilities and a full range of modular gas processing and treating units.





60 MMSCFD GSP Ethane Recovery Plant



112 MMSCFD UltraTEF Gas Plant

Gas Processing Facility Product Line

MODULAR GAS PROCESSING FACILITIES

Propak's Modular Gas Processing Facility designs are based on proven industry standards to make them practical and fit-for-purpose. Propak's EPFC turnkey facilities along with a range of individual gas processing and treating units are designed to be modularized to reduce the scope of field construction improving cost and schedule. Propak's integrated EPFC approach allows projects to go from concept to operation on industry leading timelines.

Our turnkey plants leverage Propak's extensive experience on every unit of the facility. Our expertise in modular design optimizes the plant footprint, minimizes field construction and results in significant logistical advantages. This allows Propak's gas processing plants to be built in remote locations and on leases with tight spacing limitations.

PROPak'S PROPRIETARY NGL AND LPG TECHNOLOGY

Propak is Canada's leading supplier of fully engineered Turbo Expander LPG and NGL Recovery Plants. Over the past 25 years we have established the reputation of an international industry leader in cryogenic gas-liquid recovery and separation.

UltraTEF, Propak's patented LPG Propane Recovery Process, achieves the industry-leading standard of 99.6+% propane (C3) recovery in modularized plants and process units, with the lowest specific energy requirement in the industry. We back up the Propak LPG Process with a process performance guarantee. The Propak LPG Process combines low total-project CAPEX with low OPEX and high certainty. Together with Propak's expedited project delivery through Propak EPFC, UltraTEF creates an outstanding risk-adjusted return profile.

Propak's Proprietary NGL Ethane Recovery Process Design achieves 90+% ethane (C2) recovery in cost competitive modularized plants and process units with optimized overall project costs and expedited project delivery.

Propak's focus is on providing high quality gas processing solutions meeting our client's needs. Our success is evident with Propak's track record of repeat customers. Propak frequently develops packages standardized and tailored to a particular client's needs further improving cost and schedule efficiency.

MODULAR GAS PROCESSING PLANTS (ONSHORE & OFFSHORE)

- Dew Point Control Refrigeration Plants
- Product Fractionation
- LPG & NGL Cryogenic Turbo Expander Liquid Extraction Plants
- Gas and Hydrocarbon Liquid Treating Systems
- Gas Dehydration Systems
- Micro LNG Systems
- Sulphur Recovery Units
- Amine Gas Sweetening Packages
- Glycol Heater Packages, Aerial Coolers
- Instrument Air Packages
- Modular Pipe Racks and Process Piping
- Electrical Buildings housing MCCs, Switchgears, Control Systems
- Shop Installed Buildings
- Pre-fabricated, Site Erected Buildings
- Programming & Pre-Commissioning Activities



2 x 90in I.D. x 18ft S/S Molecular Sieve Dryers



600 gpm Amine Gas Sweetening Train, 150 MMSCFD

Contact: gasprocessing@propaksystems.com

Gas Processing Project Profiles



Cryogenic Turbo Expander Plant – Alberta

PROJECT DETAILS

Propak provided detailed engineering and design, procurement and fabrication services for a Cryogenic Turbo Expander Facility. This facility was designed to process 112 MMSCFD of raw natural gas in order to meet pipeline specifications and extract ethane / propane / butane (C2 / C3 / C4) and other Natural Gas Liquids.

This plant employed Propak's design strategy for facility modularization, which allowed for trial fitting of modules prior to shipping. Modules were then staged and shipped in close coordination with field construction providing efficient execution and improvements in project schedule.

Based on the successful execution of this project, this client returned to Propak for supply of a second identical facility.

PROPAK SCOPE

Engineering and Design, Procurement, Fabrication and Start-up Support.

EPF services were completed on a Lump Sum basis.

PROJECT SPECS

- Nameplate Capacity: 112 MMSCFD
- Propak Supplied Modular Equipment:
 - UltraTEF Cryogenic Turbo Expander NGL Recovery Unit
 - Molecular Sieve Dehydration Unit
 - Deethanizer Fractionation Unit
 - Residue Gas Compression





70 MMSCFD Gas Processing Plant – New Zealand

PROJECT DETAILS

Propak provided detailed engineering and design, procurement and fabrication services for Hydrocarbon Dew Point Control (Refrigeration), Hydrocarbon Fractionation and Liquids Recovery facilities including associated equipment.

Propak’s standardized packages were altered to suit the process specifications while conforming to international transport shipping constraints.

As a requirement for this facility location, the structure of the packages was designed for an earthquake zone.

Based on Propak’s expertise and modularization capabilities, Propak was selected to provide the best solution with fabrication completed in Alberta and international shipping to New Zealand.

PROPAK SCOPE

Engineering and Design, Procurement, Fabrication, Logistics Coordination, Commissioning and Start-up Support.

EPF services were completed on a Lump Sum basis.

PROJECT SPECS

- Nameplate Capacity: 70 MMSCFD
- Propak Supplied Modular Equipment:
 - LPG Recovery
 - Stabilizer, Deethanizer, Debutanizer Fractionation Facilities
 - Propane Refrigeration
 - Glycol Regeneration System
 - Overheads Gas Compression
- All packages designed for international transport



Ship Loading for International Transport



Depropanizer and Debutanizer Fractionation Unit – Illinois

PROJECT DETAILS

Propak provided detailed engineering and design, procurement and fabrication services to build a 30,000 bbl/d Depropanizer Unit and a 9,000 bbl/d Debutanizer Unit.

Propak’s stacked design, modularization strategy, and ability to trial-fit large modules in a shop environment minimized field construction time, reducing overall project cost and schedule. Propak’s unique module design allowed for improved access to all equipment in a reduced plot area compared to the previous fractionation train installed at this site.

This unit produces propane products that exceed the HD-5 propane specifications

PROPAK SCOPE

Engineering and Design, Procurement, and Fabrication.

Propak completed the layout and process design of the third party fabricated fractionation columns.

EPF services were completed on a Lump Sum basis.

PROJECT SPECS

- Nameplate Capacity: 30,000 bbl/d (Depropanizer) and 9,000 bbl/d (Debutanizer)
- Propak Supplied Major Process Equipment:
 - Depropanizer Unit: 48 Tray 2 Pass Fractionation Column, Condenser, Reflux Accumulator, Reflux Pumps, Reboiler, Overheads Product Cooler
 - Debutanizer Unit: 42 Tray 1 and 2 Pass Fractionation Column, Condenser, Reflux Accumulator, Reflux Pumps, Reboiler, Overheads Product Cooler, Bottoms Product Pumps, Bottoms Product Cooler
 - Pipe Rack



Installation of Debutanizer Column



Cryogenic Turbo Expander Plant for C2+ NGL Extraction – Utah

PROJECT DETAILS

Propak provided detailed engineering and design, procurement and fabrication services to build a complete 250 MMSCFD NGL Gas Plant. This facility was built as an expansion to an existing 180 MMSCFD plant.

With Propak's optimized Gas Subcooled Process (GSP) ethane (C2) recovery technology, the plant successfully performance tested at rates 10% above design, while maintaining the guaranteed ethane recovery levels.

Propak's design and modularization minimized field construction time, reducing overall project cost and schedule. This Propak 250 MMSCFD project was completed for less CAPEX than the original 180 MMSCFD train.

PROPAK SCOPE

Engineering and Design, Procurement, Fabrication, Commissioning and Start-up Support.

EPF services were completed on a Lump Sum basis.

PROJECT SPECS

- Nameplate Capacity: 250 MMSCFD
- Propak Supplied Major Process Equipment:
 - Molecular Sieve Dehydration Unit
 - Turbo Expander
 - NGL Extraction
 - Demethanizer
 - NGL CO2 Removal
 - Amine Regeneration
 - NGL Transfer Pumping



Turbo Expander Unit



150 MMSCFD Refrigeration Gas Processing Plant – Alberta

PROJECT DETAILS

Propak provided detailed engineering and design, procurement and fabrication services for Hydrocarbon Dew Point Control (Refrigeration) and Hydrocarbon Fractionation and Liquids Recovery facilities including associated equipment for an expansion to a remote existing facility with limited infrastructure.

Propak has been involved in multiple stages of development at this facility. This project involved a fourth stage of capacity expansion with designs based on Propak's previous work on the successful third stage of expansion. Propak's standardized process packages were tailored to suit the process requirements and space constraints within the existing facility.

PROPAK SCOPE

Engineering and Design, Procurement, Fabrication and Start-up Support.

EPF services were completed on a Lump Sum basis.

PROJECT SPECS

- Nameplate Capacity: 150 MMSCFD
- Propak Supplied Modular Equipment:
 - Propane Refrigeration
 - Two 2,500 hp Gas Engine Drive Refrigerant Compressors
 - Deethanizer and Debutanizer Fractionation Packages
 - Glycol Regeneration System
 - Modularized pipe racks designed to integrate with existing facility
- Self-framed Buildings completed in Propak's Shop
- Compressor PLC Panels supplied and programmed by Propak



Modular Inlet Heat Exchanger and Chiller Vessel Package



Deethanizer Fractionation Unit – Alberta

PROJECT DETAILS

Propak provided Front End Engineering Design (FEED), detailed engineering and design, procurement and fabrication services to build a 30,000 bbl/d Deethanizer Unit.

Propak’s stacked design, modularization strategy, and ability to trial-fit large modules in a shop environment minimized field construction time, improving overall project cost and schedule.

Fireproofing of modules and equipment was completed in fabrication shop. Electrical end devices were wired to panels local to each module reducing field terminations and cable pulls.

PROPAK SCOPE

Engineering and Design, Procurement, Fabrication, Commissioning and Start-up Support.

EPF services were completed on a Lump Sum basis.

PROJECT SPECS

- Nameplate Capacity: 30,000 bbl/d
- Propak Supplied Major Process Equipment:
 - C2+ Liquid Molecular Sieve Dehydration Unit including: 5 MMBtu/hr Salt Bath Fired Heater, High-Speed NGL Pumps, High-Speed Regen Gas Compressors
 - Deethanizer Unit including: Deethanizer Tower, Condenser, Reflux Drum, Reflux Pumps , Reboilers
 - Ethane Product Pump Skid
 - Refrigerant Unit Including: Two 2,500 hp Propane Refrigerant Compressors, Accumulator, Condensers, Scrubbers, Aerial Condensers



Deethanizer Tower – 120 ft S/S



Phased Development of 160 MMSCFD Sour Gas Plant – Alberta

PROJECT DETAILS

Propak provided pre-FEED, FEED, detailed engineering and design, procurement and fabrication services to build a complete, expandable 80 MMSCFD Sour Gas Processing Plant. The plant was designed to sweeten and process the inlet gas to pipeline specifications and to recover and stabilize hydrocarbon liquids. The original facility was designed to easily accommodate a planned future expansion phase.

Utility systems, control and electrical systems, along with the main pipe rack piping, were all designed to accommodate future “plug and play” modules and equipment for the increase in capacity.

Propak then completed the expansion phase to double capacity to 160 MMSCFD.

PROPAK SCOPE

Engineering & Design, Procurement and Fabrication.

EPF services were completed on a Lump Sum basis.

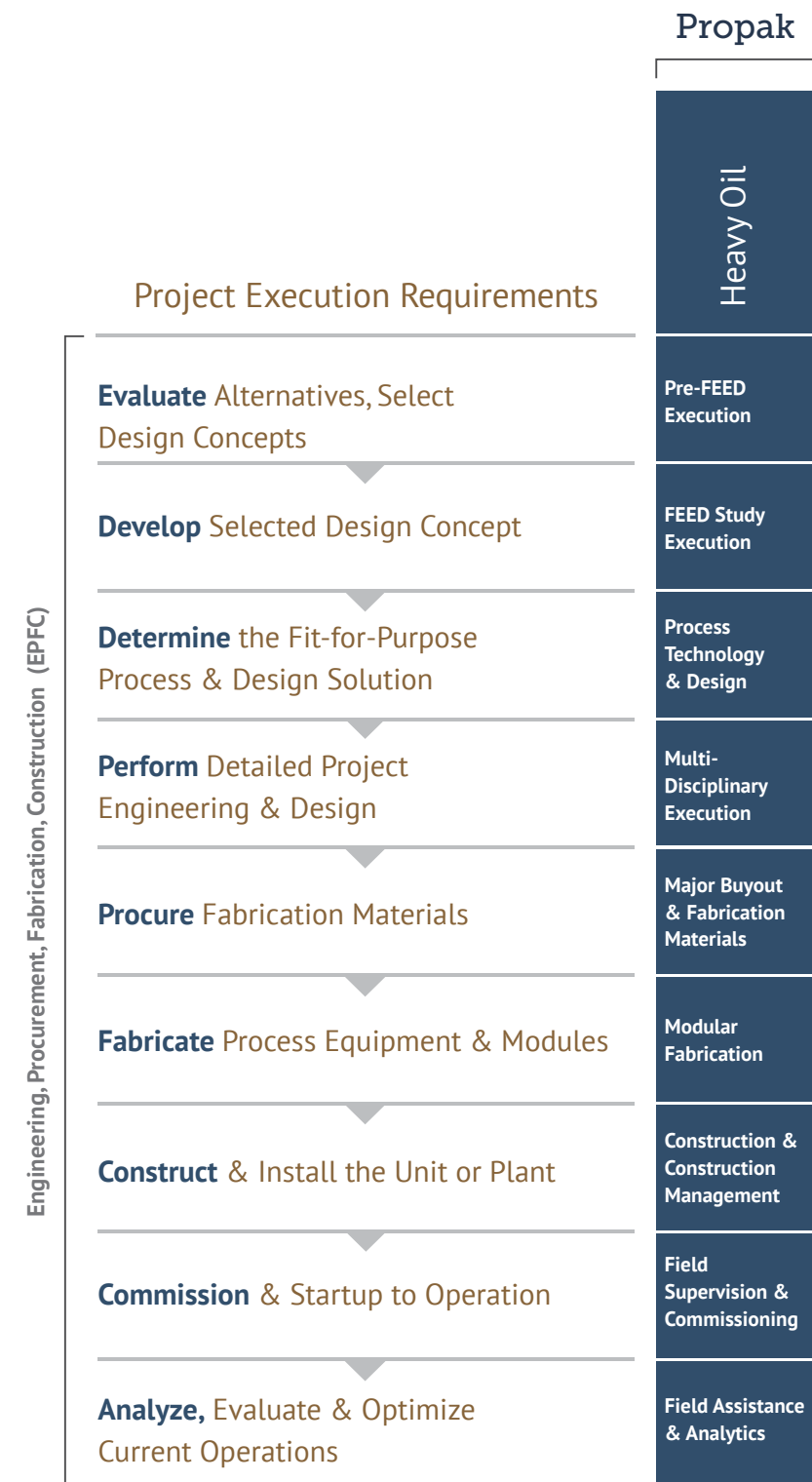
PROJECT SPECS

- Nameplate Capacity: 160 MMSCFD developed in two 80 MMSCFD phases
- Propak Supplied Modular Equipment:
 - Inlet Slug Catcher and Inlet Liquids Separation Modules
 - Inlet Liquid Stabilization Module
 - Four 5,000 hp Gas Engine Drive Inlet / Sales Gas Reciprocating Compressors
 - 24 MMBTU/h Waste Heat Recovery
 - Two Amine Gas Sweetening Plants
 - Two Propane Refrigeration Plants (Dewpoint Control expandable for Liquids Recovery)
 - Two 1,200 hp Electric Motor Drive Refrigerant Compressors
 - Two 450 hp Electric Motor Drive Recycle Compressors
 - Two 550 hp Electric Motor Drive Acid Gas Compressors
 - Two Vapour Recovery Unit (VRU) Packages:
 - Unit 1: 1x100 hp, Unit 2: 2x100 hp
 - HP and LP Flare Systems
 - Process and Utility Heat Medium Systems
 - Electrical Buildings with MCC and Plant Control System
- Integration of Controls with Existing Plant

Propak is Heavy Oil Processing



Complete, modular thermal heavy oil central processing facilities and well site facilities, including engineering, fabrication and construction. Experts in modular design, with low CAPEX and shortest practical schedules from sanction to commissioning and start-up. Engineering expertise for pre-FEED and FEED studies, detailed multi-disciplinary engineering, procurement, fabrication, field construction, operation and start-up.





Modularized SAGD Central Processing Facility

Thermal Heavy Oil Central Processing Facility Product Line

MODULAR THERMAL HEAVY OIL FACILITIES

Propak's modular thermal heavy oil facility designs are based on proven industry standards to make them practical and fit-for-purpose. Designs are standardized to realize advantages provided by the cookie-cutter approach in avoiding costly and timely customization. These facilities are modularized to minimize the amount of site construction. This results in substantial reductions to fabrication and construction capital cost and schedule compared with the designs and execution strategies of legacy thermal facilities.

Propak's thermal heavy oil facilities have been developed through applying Propak's over 45 years of modular design experience. The Propak standardized heavy oil facility designs originated as a partially modular facility and progressed to a fully modular facility eliminating all concrete foundation work further reducing the scope of field construction. This design has been further adapted to include a produced water recycle system appropriate for installation in Alberta.

MODULAR THERMAL HEAVY OIL CPF

2,500 – 20,000+ BBL/D

- Production Treatment: Inlet Separators, FWKOs, Treaters, Heat Exchangers
- Water Treatment: Boiler Feed Water Systems, Produced Water Recycle Systems, Water Disposal Systems, Evaporators
- Steam Generation: OTSG Packages, Drum Boiler Packages
- De-oiling: Skim Tanks, IGF / ISF Packages, ORF Packages
- Fuel Gas Systems, VRU Packages
- Glycol Heater Packages, Aerial Coolers
- Instrument Air Packages
- Modular Pipe Racks and Process Piping
- Electrical Buildings housing MCCs, Switchgears, Control Systems
- Shop Installed Buildings
- Pre-fabricated, Site Erected Buildings
- Programming & Pre-Commissioning Activities



Standardized Modular SAGD Well Test and Manifold Building

Standardized Modular Well Site Facility Product Line

MODULAR THERMAL HEAVY OIL WELL SITE FACILITIES

- Manifold Facilities:
 - Standardized for 1 – 9 Well Pairs per Building
 - Adaptable to Various Well Layouts and Production / Start-up Strategies
 - Configurable for Gas Lift, Rod Pumps and ESPs, Single or Dual String completions and Slant Wells
- Well Test Facilities:
 - Vertical 2 Phase Test Separators
 - Horizontal 3 Phase Test Separators
 - Group Separation, Produced Gas Condensing, Multi-Phase Pumps



Well Pad with Test Separator and 400kW Generator Packages



Saskatchewan Standard SAGD Well Pad Design

Contact: heavyoil@propaksystems.com

Heavy Oil Project Profiles



8,000 bbl/d SAGD Central Processing Facility – Saskatchewan

PROJECT DETAILS

Propak provided a turnkey EPFC solution for this thermal SAGD facility. This installation was the fifth application of a standard, repeatable, cookie-cutter thermal plant design.

Based on Propak's previous small heavy oil facilities and history of modular plant designs for the natural gas processing industry, a modular thermal SAGD facility was developed. As the fifth iteration of this standard design, efficiencies and learnings from past projects have led to a facility design that is successfully and repeatedly installed with industry leading cost and schedule metrics.

Traditional concrete foundations are eliminated in this entirely modular facility, providing significant reductions in the site construction scope of work - and to the associated cost and schedule.

This facility, consisting of 86 modules, was engineered, fabricated and constructed over an industry leading duration of less than 14 months from project sanction to first steam.

PROPAK SCOPE

FEED / Detailed Engineering and Design, Procurement, Fabrication, Field Construction, Commissioning and Start-up Assistance. The entire scope of EPFC services were completed on a Lump Sum Fixed Price basis.

FACILITY SPECS

- CPF:
 - Nameplate Oil Capacity: 8,000 bbl/d
 - Steam Generation Capacity: 22,265 bbl/d CWE
 - Pipe Racks modularized, assembled and trial fit at Propak's Airdrie facilities
 - All equipment modularized; no site erected buildings required
 - Remote I/O technology implemented allowing for instrumentation pre-commissioning in shop and savings with electrical field construction
 - Process Units: Inlet Separation, Emulsion Treatment, Source Water Treatment, Boiler Feed Water System, OTSGs, Steam System, De-Oiling, Fuel Gas System, Utilities
- Well Pads / Field Facilities:
 - 2 SAGD Pads: Total 10 Well Pairs
 - Modular well pad facilities: pre-assembled pipe racks, well control manifold buildings, test separator buildings complete with vertical test separators
 - Source Water Pumping station: modular pump and E-House building packages



16,000 bbl/d Multiple Stage SAGD Facility Development – Saskatchewan

PROJECT DETAILS

Propak completed an initial 6,000 bbl/d project at this location which included a CPF and pad facilities. The initial plant was an application of Propak's standard 6,000 bbl/d design. Propak then completed a second phase of growth at this site which integrated an 8,000 bbl/d CPF and associated field facilities to increase capacity. Following this, additions were then made to the initial CPF bringing the total combined nameplate capacity to 16,000 bbl/d.

Propak's line of modular thermal heavy oil facility designs facilitated the successful staged development approach implemented at this location. Keeping all modules standard allowed for simplified duplication and integration across multiple development phases.

Development began with pre-FEED and FEED phases validating the concept and fit of this facility. The modular designs were successfully adapted to fit this application. Planning for modular future expansion allowed for a streamlined execution model.

PROPAK SCOPE

Pre-FEED / FEED / Detailed Engineering, Procurement, Fabrication, Field Construction, Commissioning & Start-up Assistance, and Ongoing Maintenance & Support.

FACILITY SPECS

- Twinned CPF:
 - Nameplate Oil Capacity: 16,000 bbl/d
 - Steam Generation Capacity: 44,530 bbl/d CWE
 - Pipe Racks modularized, assembled and trial fit at Propak's Airdrie facilities
 - All equipment modularized; no site erected buildings required
 - Remote I/O technology implemented allowing for instrumentation pre-commissioning in shop
 - Process Units: Inlet Separation, Emulsion Treatment, Source Water Treatment, Boiler Feed Water System, OTSGs, Steam System, De-Oiling, Fuel Gas System, Utilities
 - Standardized, repeatable modules allowing for simplified, streamlined phased expansion with common shared utility systems
- Well Pads / Field Facilities:
 - Multiple standardized modular well pad facilities: pre-assembled pipe racks, steam injection and production well control manifold buildings, vertical test separator vessel packages
 - Integrated on-site natural gas power generation for prime power at CPF and all well pads



SAGD Central Processing Facility Designs with Water Recycle

FULL WATER RECYCLE FACILITY DESIGN DETAILS

Expanding on Propak's successful SAGD projects, Propak has completed a design for a 5,000 bbl/d full water recycle facility.

The engineering process involved evaluating and redesigning the de-oiling and water treatment process areas to implement produced water recycle capabilities. This redesign work was completed maintaining Propak's successful philosophies for standardization and modularization.

A design was developed achieving the level of definition required to propose a Lump Sum EPFC solution.

FACILITY SPECS

- Nameplate Oil Capacity: 5,000 bbl/d
- Steam Generation Capacity: 16,450 bbl/d CWE
- Modular process units (inlet separation, emulsion treatment, source water treatment, produced water recycle, boiler feed water system, steam system, water de-oiling, utilities, and pipe racks)
- Hot lime softening selected for facility design however this would be adaptable to various other water treatment technologies
- Full compliance with AER Directive 081 water disposal limits

PARTIAL WATER RECYCLE SYSTEM ADDITION

Propak completed an addition to an 8,000 bbl/d SAGD CPF, built previously by Propak in Saskatchewan, to allow the recycle of a portion of the produced water associated with thermal oil production.

Propak developed and integrated a system consisting of electrocoagulation, dissolved air flotation, and filtration technologies, along with other ancillary equipment, into the produced water handling system of Propak's modular facility. Provisions for this expansion were included in the initial project development stages allowing for this equipment to be easily installed on site.

FACILITY SPECS

- Recycle of a portion of facility produced water with a package design throughput of 2,500 m³/d
- Discharge water rate of 94% of inlet flow returned as treated water suitable to supplement the OTSG's feed water system
- Electrocoagulation, dissolved air floatation, and filtration systems for treating water
- Sediment-water slurry centrifuge system included to dewater the waste streams for further water recovery and solids disposal



10,000 bbl/d SAGD Central Processing Facility – Saskatchewan

PROJECT DETAILS

A competitor performed an initial pre-FEED study and proposed a high estimated cost to the client.

Propak was then brought in to complete a FEED study to evaluate the design. This study concluded with Propak proposing a highly modularized plant solution taking advantage of Propak's integrated EPF approach. Propak engineered, fabricated and constructed a modular plant creating schedule and cost advantages.

Upon completion, the result was a \$21M net reduction in actual project cost from the original estimate and an approximate 55% reduction in CPF footprint.

PROPAK SCOPE

FEED / Detailed Engineering and Design, Procurement, Modular Fabrication, Construction Management Assistance, On Site Construction Engineering Support, Commissioning and Start-up Assistance.

Propak provided cost and schedule certainty to the client through applying an integrated EPF solution along with a highly modularized, shop fabricated facility.

FACILITY SPECS

- CPF:
 - Nameplate Oil Capacity: 10,000 bbl/d
 - Steam Generation Capacity: 31,200 bbl/d CWE
 - Pipe Racks modularized, assembled and trial fit at Propak's Airdrie facilities
 - Highly modularized facility design
 - Process Units: Inlet Separation, Emulsion Treatment, Source Water Treatment, Boiler Feed Water System, OTSGs, Steam System, De-Oiling, Fuel Gas System, Utilities
- Well Pads / Field Facilities:
 - 2 Pads: 9 SAGD Well Pairs Each
 - Modular well pad facilities: pre-assembled pipe racks, well control manifold building, test separator building complete with horizontal test separator vessel.



Well Pad Expansion and Debottlenecking Projects – Alberta

PROJECT DETAILS

Propak provided engineering design, modular fabrication and on-site construction support for a series of well pad installations, central field facility upgrades and central processing facility debottlenecking projects.

Well pad manifold building sections and vertical test separator building sections were developed to meet process and well spacing requirements. These building sections were designed to be fully modularized and repeatable. Subsequent well installations on multiple pads leveraged varying numbers and arrangements of these building sections.

To further increase production, Propak completed debottlenecking projects within the CFF for the produced gas condensing system and within the CPF on the lift gas and steam distribution systems. A high pressure steam system was installed allowing for higher quality steam to be distributed to the new well pads.

PROPAK SCOPE

Detailed Engineering and Design, Procurement, Modular Fabrication, Construction Management Assistance, On Site Construction Support and Start-up Assistance.

WELL PAD FACILITY SPECS

- Standard one and two SAGD well pair manifold building sections which can be configured for various pad layouts and well counts
- Standard well test buildings complete with vertical separator vessels and all associated metering
- Pad installations complete with modular pipe racks and isolation valve platforms
- Over 100 SAGD wells tied in with 10 test separators using the standard building sections across 5 well pads

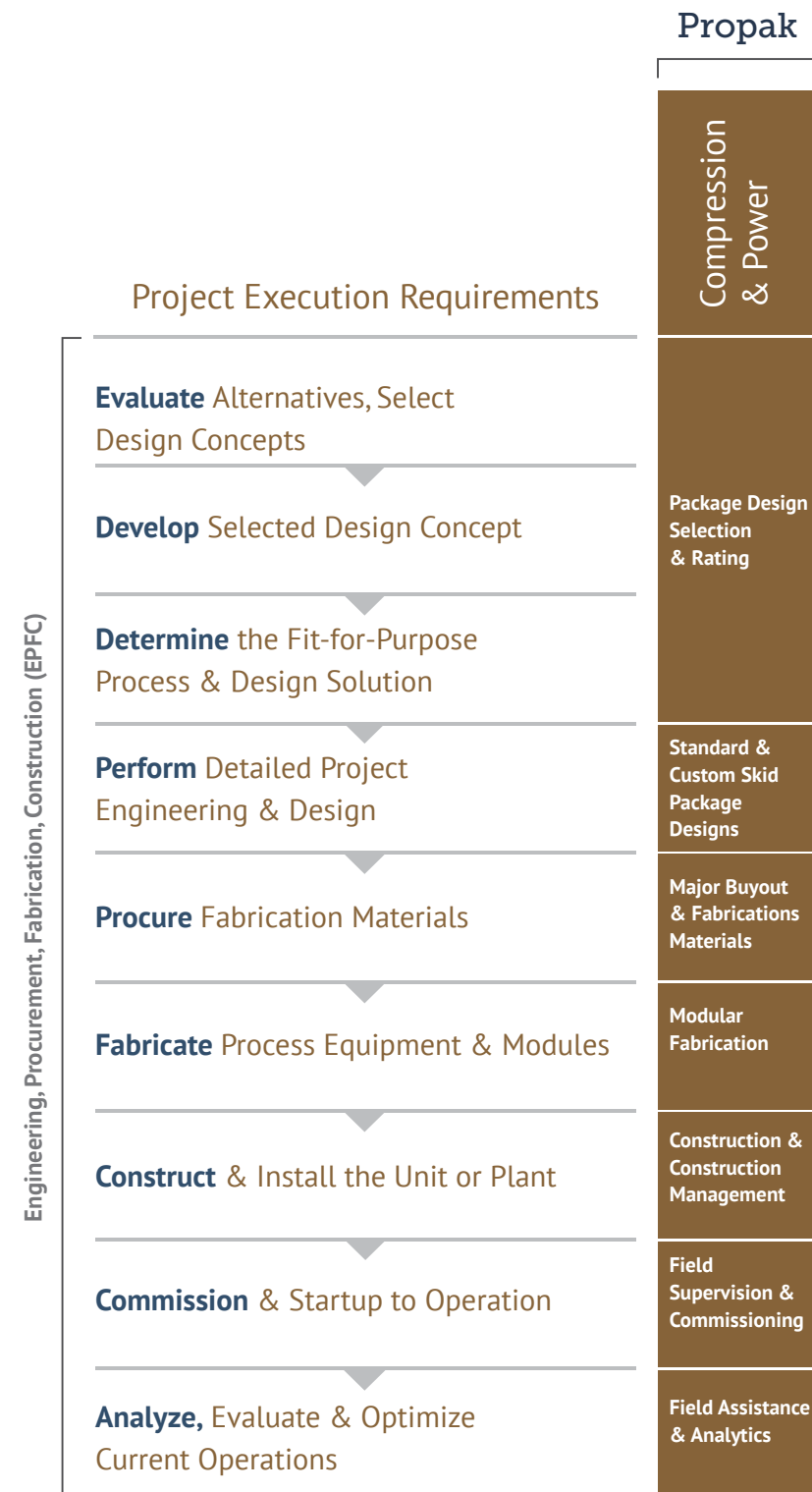
DEBOTTLENECKING PROJECT SPECS

- 900 class steam distribution installed alongside existing 600 class system through the CPF
- 900 class flowline network installed with tie-ins for new and future well pad locations
- High pressure steam separator vessel installed for the 900 class system
- Reciprocating compressor package installed at CPF to boost gas supply pressure to distribution flowlines for gas lift at well pads
- Produced gas condensers installed at central field facility to accommodate production from new well pads

Propak is Compression & Power



Propak clients engage the Propak Advantage in two main ways. They create industry leading value by engaging one or more of our complete suite of Compression and Power services. And they create maximum value by engaging end-to-end, EPFC solutions.





Compressor Package Loaded for Rapid International Transport



Compak Series Compressor Package



Dual 600 kW Gas Generator Package

Compression Product Line

MODULAR COMPRESSION SYSTEMS

- Reciprocating single or multi-stage compressors up to 10,000 hp
- Rotary screw compressors up to 3,000 hp
- Gas engine or electric motor drives
- Custom or standard designs

INNOVATIONS

Innovation within Propak's compression business unit is an iterative process designed to enhance quality and value for the owner. Propak innovations in compression packages include:

- Modular systems for greatly reduced transportation and installation costs
- Single day installations for aggressive schedule requirements
- Sophisticated PLC systems for optimum monitoring and control
- FEA analysis for enhanced vibration reduction
- Flanged connections on all scrubbers and bottles
- Double-walled waste liquid containment
- Torsional Analysis, Acoustical and Pulsation Studies
- Packages available with zeroVent option to comply with strict methane emission limits.

DISTRIBUTOR AND OEM FOR COMPRESSORS AND ENGINES

- Distributor for Ariel compressors
- Distributor for Dresser-Rand compressors
- OEM for Caterpillar natural gas engines
- OEM for Waukesha natural gas engines

GAS COMPRESSION MARKETS SERVED

- Gas processing and gathering
- Gas storage
- Pipeline transmission
- CO2 sequestration and enhanced oil recovery
- Landfill gas and fuel gas boosting
- Coal Bed Methane (CBM) compression
- Propane refrigeration
- Overheads, recycle and acid gas compression

COMPAK SERIES COMPRESSION PACKAGES

- The Propak Compak series gas compressors are modular units designed specifically to reduce transportation and installation costs. Propak offers the ability to lease different sized units for optimal compressor selection for boost applications.
- Largest model (Compak C1380-JGT-4): 12 ft wide by 11 ½ ft high by 40 ft long with total weight of 120,000 lbs
- Multiple options available to customize the Compak unit to suit your application

Power Generation Product Line

MODULAR POWER GENERATION SYSTEMS

- Reciprocating natural gas fuelled engine drives: 50 and 60hz
- Low voltage designs up to 1,200 kW per unit
- Medium and high voltage designs up to 5,000 kW per unit
- Low to high BTU fuel gas capability
- Offshore and onshore designs
- Single or multiple-unit systems

POWER GENERATION MARKETS SERVED

- Remote gas gathering / processing facilities
- Industrial prime power
- Peak shaving
- Utility support
- Flare reduction
- Co-generation
- Landfill gas-to-energy
- Biogas-to-energy

INNOVATIONS

- Sophisticated PLC systems for optimum monitoring and control
- Engineered vibration control
- Expandable designs, scalable to future power demand requirements



6.6 MW Power Generation

Contact: sales@propaksystems.com

Compression & Power Project Profiles



Solution Gas Compression Facility - North Dakota

PROJECT DETAILS

Propak provided a turnkey EPFC solution for this gas compression facility. This facility was successfully installed implementing Propak's proven execution strategy with standardized, modular equipment.

Propak has developed and refined this design and has supplied repeated duplicate plants at multiple locations for the same client.

Constructing these standard modular compression facilities has provided our client with significant cost savings and fast-tracked construction timelines.

PROPAK SCOPE

- Detailed Engineering and Design, Procurement, Fabrication, Field Construction, Commissioning and Start-up Assistance
- EPFC services were completed on a Lump Sum Fixed Price basis

FACILITY SPECS

- 60 MMSCFD Gas Compression Facility
- Propak supplied modular equipment:
 - Pipeline Inlet ESD and Pig Launcher/Receiver Modules
 - Inlet Separator Package
 - Six Compressor Packages (Four Throw, Three Stage, 2,500 hp Electric Drive)
 - Condensate, Water, and Utility Storage Tanks
 - Condensate / Water Pump Package
 - Vapour Recovery Unit
 - Sales Gas Metering / Discharge Scrubber Module
 - E-House Building housing MCC and Plant Control System Equipment
 - Instrument Air Package
 - Flare stack and Flare Knockout Drum Module
 - Facility Pipe Racks



Major Gas Compression Project – China

PROJECT DETAILS

Propak supplied 59 large, high spec compressor units for high pressure gas storage facilities at several different sites across China. The combined power of all units was 305,000 hp. These high performance and high spec units were fabricated in Airdrie, Alberta and shipped within a 12 month period in order to meet the client's tight delivery window.

PROPAK SCOPE

- Engineered and designed to client's performance requirements
- Completed torsional analysis of drive system
- Designed, manufactured and programmed PLC control systems with bilingual displays
- Coordinated shipping to widely dispersed sites in China
- Reassembled and commissioned at site
- Executed as a fast track project with overlapping engineering, procurement, fabrication and construction phases

COMPRESSOR SPECS

- Six throw, two and three stage reciprocating compressors
- 5,000 hp to 6,000 hp electric motor and natural gas engine drivers
- High pressure design, discharge pressures of up to 41 MPa



Crating Compression Package for Ocean Freight



Power Generation Facility – Alberta

PROJECT DETAILS

Propak supplied a total of four 1,050 kW modular power generation packages to provide prime power for a facility located in Alberta. The client required that three of the units be installed initially and the fourth be added in the future. This necessitated that the overall layout design allow for a seamless future addition of the fourth package at site.

Propak's detailed engineering expertise and experienced on-site construction group, the addition was completed quickly, safely and in a cost effective manner.

PROPAK SCOPE

- Performed detailed 3D modeling and engineering for a custom package
- Procured material
- Fabricated tanks, spooling, skid and miscellaneous structural components
- Assembled and tested at Propak's shop
- Field erected building with HVAC system
- Field installed building electrical package by Propak
- Reassembled and provided start-up and commissioning support at site

POWER GENERATION SPECS

- Four 1,050 kW generator packages
- Natural gas engine drivers
- Single bolt-up modular crane structure to service all four units
- Expandable self-framing insulated building with HVAC



Power Generation Facility



Modularized Gas Compressor Station – North Dakota

PROJECT DETAILS

Propak supplied 8 standardized, modular compressor packages to pressurize and transport raw, rich gas via a downstream pipeline. Each package consisted of a main skid with two vestibule sections and a vertical air cooler. These packages were fabricated, assembled, and trial fit at Propak's shop prior to being disassembled and prepared for transportation to site in North Dakota.

These packages were designed for easy transport with tight shipping constraints and simple on-site reassembly. With a standard package design, this installation was developed in a staged approach, adding additional compressor units as capacity increased.

This compressor package design was standardized for this client and has been repeatedly duplicated and installed at multiple different locations.

PROPAK SCOPE

- Engineered and designed compressor modules to client's requirements
- Fabricated modular packages suitable for shipment to this location within tight shipping envelope
- Provided reassembly, start-up, and commissioning support at site

FACILITY SPECS

- 8 Modular Compressors:
 - Four throw, four stage reciprocating compressors
 - 1,600 hp electric drive units
 - Four-stage machines designed to compress gas from suction pressure of 69 kPag to discharge of 8,620 kPag
- Independent MCC modules fabricated and supplied by Propak with each compressor package
- Propak fabricated modular gas dehydration package installed on same site



Compressor Assembled and Trial-Fit in Controlled Shop Environment



Inlet and Sales Compressor Stations – Alberta

PROJECT DETAILS

As part of Propak's EPF scope for a 160 MMSCFD Sour Gas Plant, Propak designed and fabricated four dual service modular inlet / sales compressors. As the entire facility was executed by Propak, the compressor was consistent in design and fit with the entirety of the plant.

Propak relied on the expertise of our engineers and designers to build a custom package according to detailed client requirements while adhering to high safety standards.

During the design phase, an extensive HAZOP was conducted reviewing the interaction between the compressors and the other units of the plant. Propak worked closely with the client to incorporate these HAZOP considerations into the final design.

PROPAK SCOPE

- Performed Pre-FEED, FEED and Detailed Engineering and Design
- Completed in-house pulsation studies and pulsation bottle designs
- Procured Material
- Fabricated vessels, spooling, skid and miscellaneous structural components

- Designed, Manufactured and Programmed PLC control systems
- Assembled and Tested at Propak's Shop
- Executed as Lump Sum Fixed Price

INLET / SALES COMPRESSOR SPECS

- Six throw, two service reciprocating compressor
- Service 1: sour gas two stage inlet compression
- Service 2: sweet gas single stage sales compression
- 5,000 hp natural gas engine driver
- Engine exhaust waste heat recovery system
- Building complete with noise attenuation

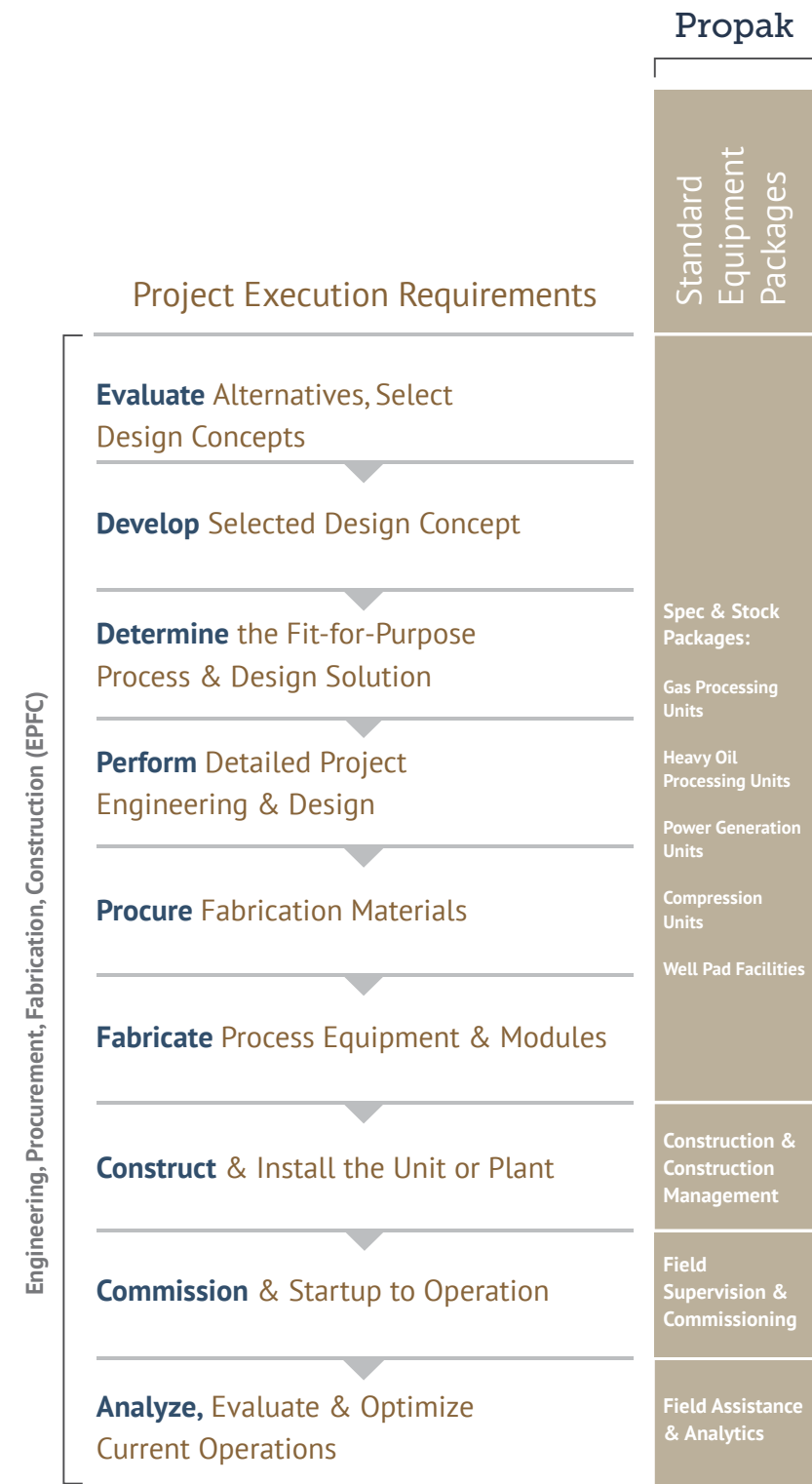


Two Service Reciprocating Compressor

Propak is Standard Equipment



Propak clients gain the Propak Advantage when they engage our Standard Equipment Sales. Every Spec and Stock Package has our modular expertise built in, and is the result of our extensive experience in gas processing, heavy oil processing, gas compression and power generation. Propak's Equipment Leasing Program allows our clients the opportunity to conserve capital while providing operational versatility for optimization over the life of oil and gas facilities.



PROPAK IS STANDARD EQUIPMENT

PROPAK IS STANDARD EQUIPMENT



Mechanical Refrigeration Unit, 900hp



Gas Dehydration Unit



100 hp Refrigeration Unit

Product Line

STANDARD DESIGN, PRE-BUILT & STOCK MODULAR GAS PROCESSING EQUIPMENT PACKAGES

- New and used processing plants, for purchase or lease
- Gas Dewpoint Plants / LPG Recovery Refrigeration Plants (5 to 60 MMSCFD, up to 900 hp)
- Dewpoint Control Choke / JT Units (1 to 4 MMSCFD)
- Dehydrators for sweet and sour gas applications (12" to 36", 1,310 psig to 1480 psig)
- 15 MMSCFD Amine Treating Units

STANDARD DESIGN AND STOCK MODULAR GAS COMPRESSION PACKAGES

- Reciprocating Gas Compressors (195 hp to 1,775 hp)
- Low Pressure Booster Compressors (203 hp to 1,345 hp)
- Ariel packages and Dresser Rand field compressor packages

SURPLUS EQUIPMENT SALES

Separators, skids, compressor cylinders, frames, engines, and many other kinds of equipment used throughout the oil and gas industry.

STANDARD DESIGN THERMAL HEAVY OIL PROCESSING EQUIPMENT PACKAGES

- Well Manifold Packages (1 to 9 SAGD well pairs)
- Vertical two-phase Test Separator Packages
- Horizontal three-phase Test Separator Packages
- OTSGs for Enhanced Oil Recovery (25 to 180 MMBTU/h)
- Glycol Heaters (15 MMBTU/h)

CLIENT SPECIFIC STANDARDIZED MODULAR PACKAGES

Propak has many repeat customers for which a standard package has been tailored to suit their particular specifications. Once developed as a client standard package, duplicate projects have then been executed providing increased efficiency and improved delivery.

Client standard packages ranging across all of Propak's energy processing equipment product lines have been successfully duplicated and installed in multiple locations both domestically and internationally.



4-Well SAGD Manifold Package



Heavy Oil Vertical Test Separator Package



1,004 hp Screw Compression Package



1,005 hp, 3-Stage, Reciprocating Compressor Package

Contact: sales@propaksystems.com



Propak Stock Contactors



Propak Stock Dehydration Packages



Power Generation Packages

Propak Equipment Leasing Program

Propak will be pleased to provide a rental / lease proposal on a complete range of oil and gas production equipment and facilities to meet your requirements.

CAPITAL CONSERVATION

The reduction of debt and maintenance of capital has become a major consideration and many Producers are electing to retain maximum capital available for the exploration sector of their operations. A leasing arrangement enables the Producer to concentrate on finding oil and gas and use Propak capital for production equipment requirements.

OPERATIONS FLEXIBILITY

Due to the constantly changing nature of oil and gas production operations, many production equipment requirements are for an indefinite or relatively short term. Rental equipment provides the Producer with the option and versatility of changing, upgrading or returning the equipment to Propak, as circumstances and requirements change. Further flexibility is available on a "lease with option to purchase basis", should the Producer eventually decide to own the equipment.

ENGINEERING, OPERATIONS AND MAINTENANCE

Cost effectiveness and production revenues are maximized by Propak's engineering, operations and maintenance capabilities. Propak's engineering expertise will ensure the most effective approach to equipment selection. A comprehensive technical field staff is available for completed installation, operation, service and maintenance requirements. Engineering and field staff are supported by Propak's fabrication capability and extensive material and equipment inventory.

COST EFFECTIVENESS

A leasing / rental arrangement frequently proves more profitable to the Producer with consideration of replacement costs, operating / credit lines, cash flow and tax considerations. Producers may elect to have Propak operate plants and equipment. On-time guarantees will be provided which can significantly reduce costs and exposure to lost revenues from mechanical or process failure.



Refrigeration Package



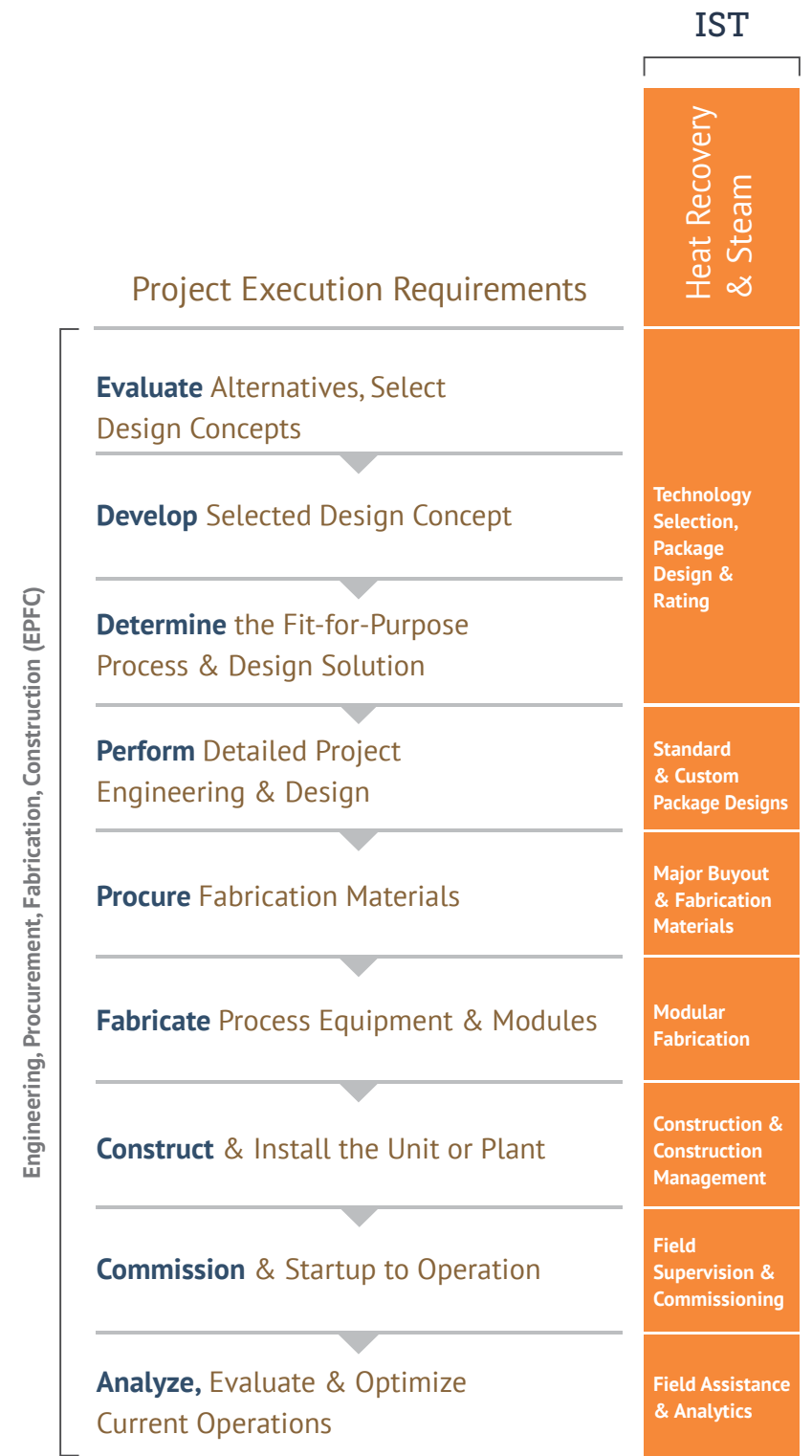
Heavy Oil Free Water Knock Out Module

Contact: sales@propaksystems.com

Propak is Heat Recovery & Innovative Steam Technologies



Innovative Steam Technologies, a division of Propak Systems Ltd., adds value to the Power Generation and Energy Industries as a leading supplier of a unique type of Heat Recovery Steam Generator (HRSG) called Once Through Steam Generators (OTSG). We are strategically positioned to provide improved energy efficient solutions to support the ongoing global energy transition. IST has the energy expertise to provide the most efficient heat recovery and utilization solutions for our clients' power needs. For enhanced oil recovery (EOR) applications, our patented rifled pipe technology provides an industry leading solution for steam generation. IST is your solution for heat recovery and steam generation, done a better way.





Twelve Heat Recovery OTSGs Installed in Combined Cycle Power Plant

OTSGs for Heat Recovery

IST engineers, designs, and manufactures Once Through Steam Generators (OTSG) for heat recovery. The markets served are combined cycle power generation, cogeneration, steam injected gas turbines (STIG), waste heat recovery (WHRU), and offshore heat and power generation. IST has over 180 installations worldwide.

ONCE THROUGH STEAM GENERATORS:

- Ideal for installations behind combustion turbines ranging in size from 5 to 120MW
- Dry running capability
- Lighter, smaller footprint compared to conventional drum boilers for reduced real estate needs
- No diverter and bypass systems required, which eliminates associated heat loss
- Fast start-up and flexibility
- Fewer instruments and control loops compared to conventional drum boilers
- Modular design for reduced installation time
- Offshore and onshore designs
- Emissions control systems available in configurations without the need for diverters or bypass stacks
- Capable of multiple fuel combinations including natural gas, diesel, bio-fuels, and hydrogen
- Supplementary firing available to promote improved efficiencies
- OTSG inherent advantages allow for an improved environmental solution

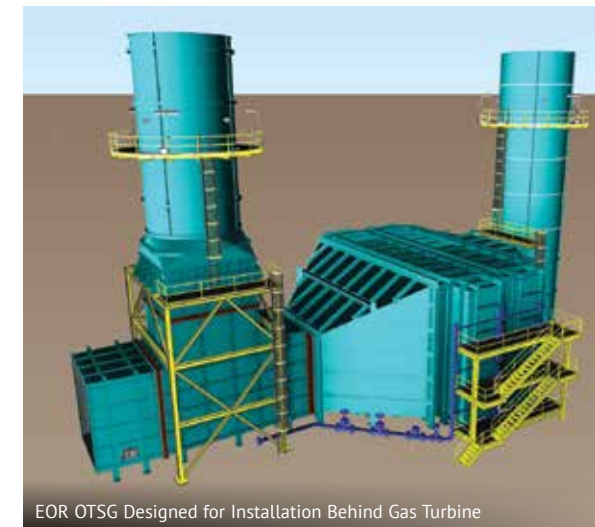
COMBINED CYCLE POWER PLANTS:

The IST OTSG design allows fast start up of combined cycle power plants to integrate with intermittent renewable power such as solar and wind. IST can provide complete solutions for engineering, procurement, fabrication, and construction of combined cycle power plants including:

- Fuel Conditioning
- Gas Turbines / Steam Turbines
- Water Treatment and Boiler Feedwater Systems
- Single or Multi Pressure OTSG with capability for Water Heater circuit
- Supplementary Firing Option
- Condenser and Cooling System
- Electrical Building
- Process Control and Automated Safety Systems
- Power Transformers and Synchronization Systems
- Switchyard and Grid Connections
- Organic Rankine Cycle (ORC) Power Plants

WASTE HEAT RECOVERY:

- Recovers heat from high and low quality process sources:
 - Turbine Generator Exhaust
 - Engine Exhaust and Jacket Cooling
 - Heat of Compression
- Potential to utilize waste heat for carbon offsets
- For green and brownfield WHRU applications



EOR OTSG Designed for Installation Behind Gas Turbine

OTSG for Enhanced Oil Recovery

IST's fully modularized EOR OTSGs offer our patented SQ90™ rifled pipe technology allowing for 90% steam quality. Utilizing this technology, the same dry steam flow can be achieved at up to 11% reduction of boiler feedwater versus a conventional EOR OTSG. In turn, this lowers our client's water treatment throughput, reducing chemical usage and overall water treatment operating costs.

EOR OTSGs:

- OTSGs up to 300 MMBTU/h (88 MW)
- Boiler designed to ASME Section I, and boiler external piping designed to ASME B31.1
- Operating pressures up to 2500 psig (172 bar)
- Radiant chamber diameters from 8 - 24 ft. (2 - 7.3m)
- Can be designed for multiple fuel combinations
- Installations range from harsh northern climates, to tropical marine regions, to desert environments
- Single or multi-circuit configurations
- Horizontal or vertical convective designs

IST AND PROPAK INNOVATIONS:

- Patented SQ90™ rifled pipe technology for 90% steam quality increasing oil production while decreasing operating costs
- Patented fully modularized and winterized OTSGs
- Remote I/O technology allows instrumentation pre-commissioning in fabrication shop
- Programmed and tested process control system



Helical Coil Installation on Heat Medium Heater

EOR OTSGs BEHIND GAS TURBINES:

- Modularized coils to reduce field erection time
- Multi-circuit
- Supplementary firing capability
- Patented SQ90™ rifled pipe technology available
- Includes bypass system ducting, stack, and boiler external piping

Heat Medium Heaters

IST engineers, designs, and manufactures fully modularized heat medium packages. Our inhouse engineering ensures your packages meet all of your specifications and design requirements.

- Single helical coil and nested helical coil configurations
- Multi-circuit capability and 2 or 3 gas pass options
- Heat medium: Water, Water/Glycol, Ethylene Glycol, Triethylene Glycol, Thermal Oils
- Design codes: ASME Section VIII, ASME Section I
- Options to package circulation pump, filtration, and expansion drum on same module to minimize field installation and commissioning time

Contact: sales@otsg.com

Heat Recovery & Innovative Steam Technologies Project Profiles



Heat Recovery OTSGs at Cogeneration Plant – Ontario

PROJECT DETAILS

This combined cycle power plant was constructed to provide dedicated electrical power, cooling and heating for a major International Airport following the U.S. blackout in 2003. The 112 MW power plant is optimized to achieve low cost operation and reliable power delivery for this airport and related infrastructure.

IST supplied two (2) dual pressure once-through steam generators installed behind LM6000PD gas turbines, complete with supplementary firing and provision for future installation of emissions control equipment.

The customer selected OTSGs because they are ideally suited for a combined cycle application due to their efficient steam production and flexible operation. OTSGs are capable of extremely fast start-ups and are typically able to supply full steam loads within 60 minutes. The fast start-up of OTSGs allow both the gas turbines to reach full load and the Selective Catalytic Reduction systems (SCRs) to achieve their minimum operating temperature much quicker than traditional drum Heat Recovery Steam Generators (HRSGs).

The absence of drums and the modular design and manufacture of OTSGs facilitates easy and rapid shipment and erection of the units. Each unit consists of five modules.

These OTSGs offer high availability, high efficiency, simple operation, dry running, and the lowest installed and life cycle costs in the industry.





Oil Production Platform Combined Cycle System OTSGs – Gulf of Mexico

PROJECT DETAILS

Four (4) IST OTSGs were installed as part of the platform’s combined cycle steam system. This system allows the platform to operate well below regulatory requirements for NOx emissions, while reducing one the largest operating expenses – fuel.

Each OTSG recovers waste heat from an LM2500+G4 gas turbine, and was manufactured as a single pressure module. Each OTSG provides the client with exceptional turndown capabilities, and is complete with supplementary firing to further increase operational flexibility and boost overall steam production.

The OTSGs are uniquely configured to minimize footprint and weight on the platform. This was of significant benefit to the project as space is at a premium on any offshore platform. This was accomplished by elevating the OTSG directly above the gas turbine exhaust flange and orienting the inlet ducting vertically.

The drum-less once through technology also eliminates nuisance drum level alarms and boiler trips caused by the pitch and roll of the sea. This also enhances safety of the whole offshore plant through elimination of a large, pressurized storage volume inherent with a drum-type boiler.

The absence of drums and the modular design and manufacture of OTSGs facilitates easy and rapid shipment and erection of the units which reduces erection time and crane usage/requirements. The use of small diameter tubes and modular construction allows for a lightweight and compact design that is ideally suited for projects that have weight and size restrictions.

OTSGs demonstrate a significant improvement over the natural circulation drum-type units. They offer high availability, proven experience, and cost saving benefits.



OTSGs Installed on Offshore Platform



90 MMBTU/h Enhanced Oil Recovery OTSGs – Saskatchewan

PROJECT DETAILS

IST provided engineering design, modular fabrication, field construction, and commissioning & startup services for a series of enhanced oil recovery OTSGs. This standardized OTSG design has been installed in multiple facilities with over 20 units currently in operation.

The OTSGs were designed using our fully modularized and winterized technology, which reduced overall project schedules. These OTSGs provide 90% quality steam using IST’s patented SQ90™ design.

The control system was programmed in-house allowing for operator software FAT at Propak’s simulation and training facility and facilitates operational support provided by Propak’s automation group.

SQ90™ delivers a higher profit potential with no additional risk. SQ90™ advantages:

- Increased oil production with lower operating costs
- More saturated steam from less water
- Lower fuel consumption and greenhouse gas emissions
- Significant reduction of blowdown handling and water treatment costs
- Same feedwater quality requirements as a conventional 80% steam quality straight tube boiler

OTSG SPECS:

- 90 MMBTU/h
- Patented fully modularized and winterized technology
- Patented SQ90™ rifled piping technology, providing 90% steam quality
- Remote I/O technology implemented allowing for instrumentation pre-commissioning in shop
- Propak programmed process control system

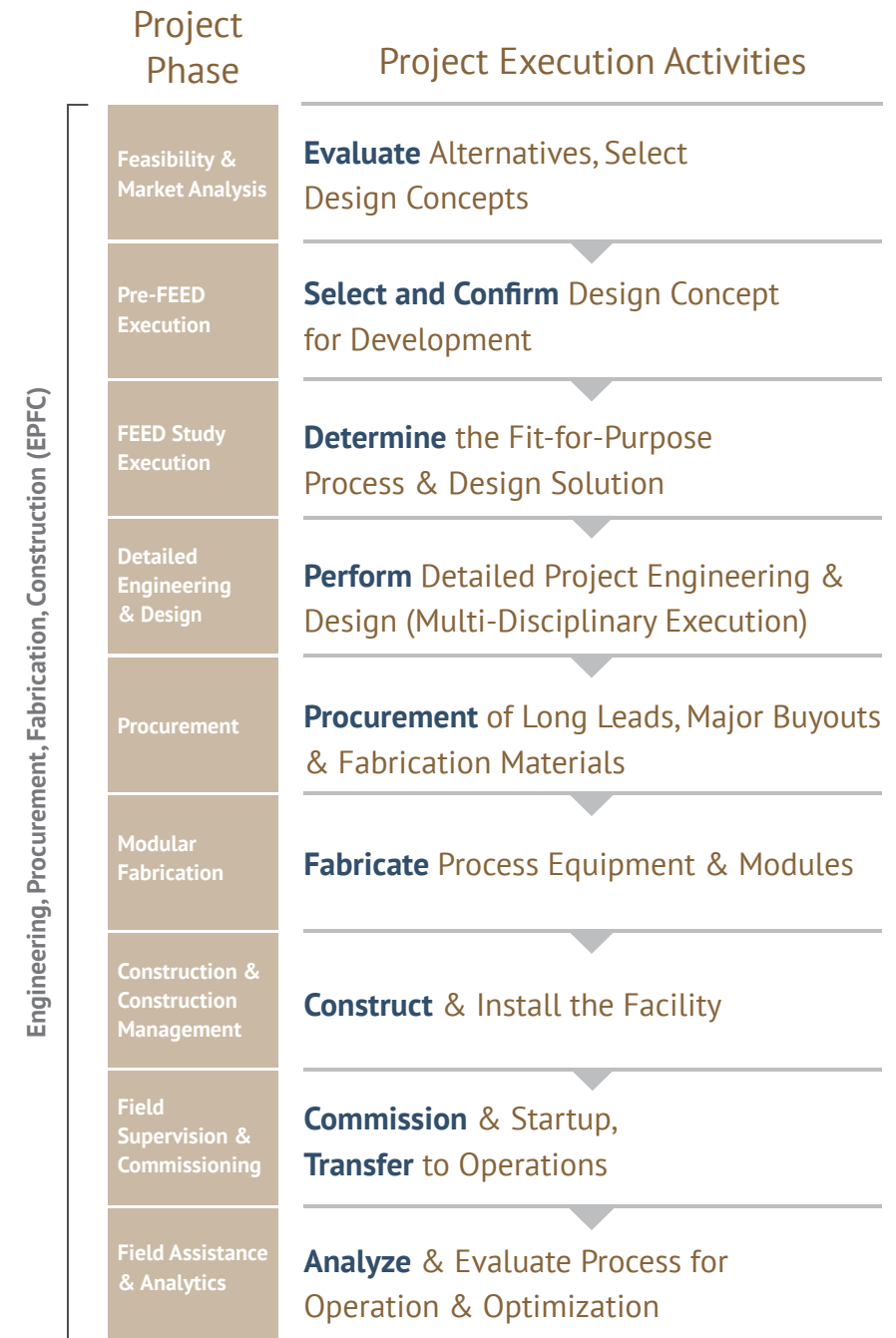
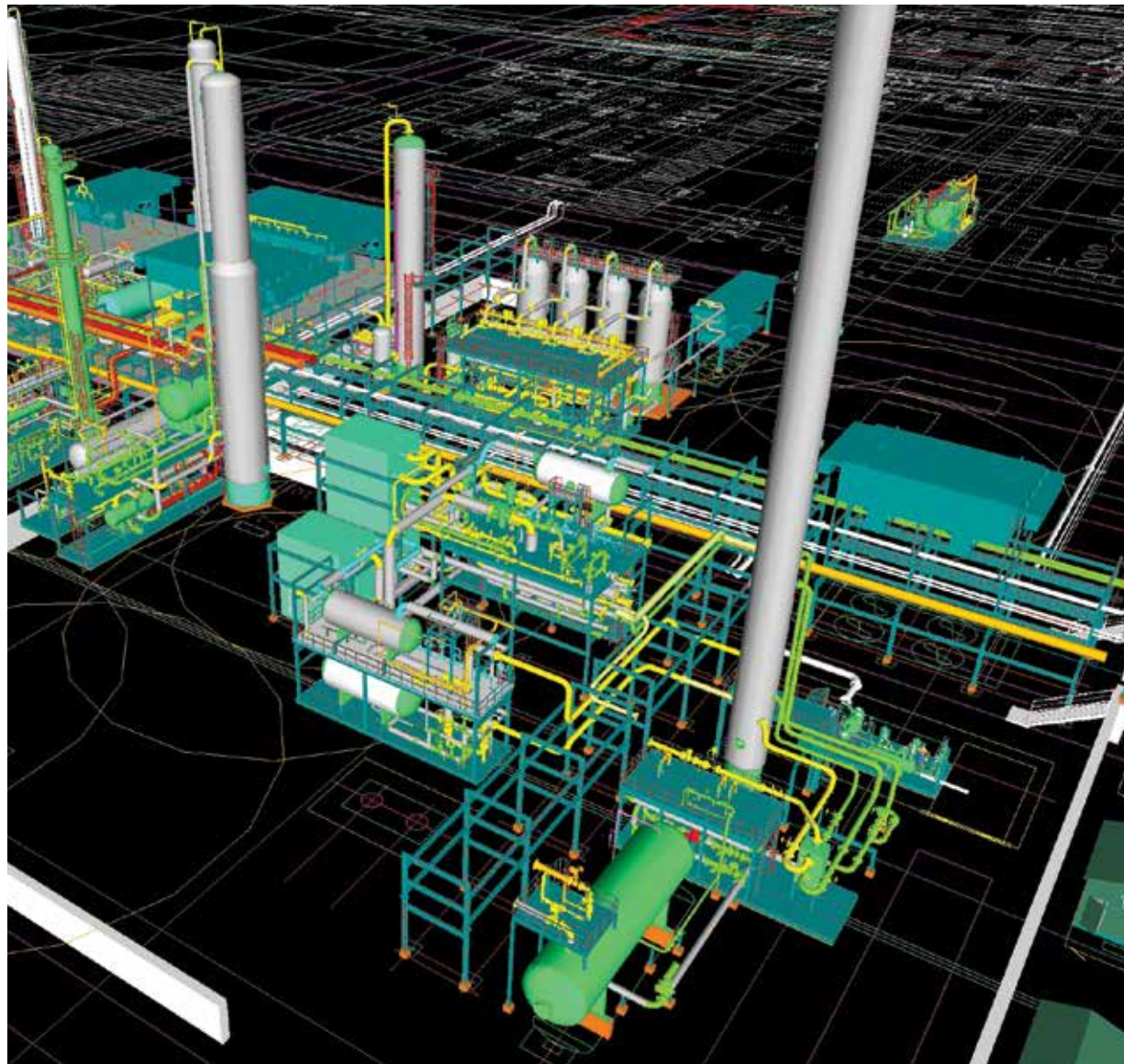


1-Piece Modular Radiant and Burner Section Installation

Propak is Engineering Services



Propak Engineering Services delivers a complete suite of multi-disciplinary engineering services with expertise in a variety of energy processing plants. Our clients benefit from the Propak advantage of a completely in-house project engineering and management team. Engineering services are integrated with shop fabrication and field construction facilitating effective communication, increased efficiency and increased productivity.





3D Modeling for Integrated EPFC Engineering, Design and Analysis

Engineering Services

Propak is an industry leader in engineering for energy processing, providing solutions for natural gas processing and treating, including proprietary Propak technologies; heavy oil SAGD processing; compression and power; heat recovery and steam generation; and standard equipment packages.

We provide end-to-end project management capabilities, from conception to completion, focused on executing projects on budget, on time, and with uncompromised safety and quality.

We are world-class experts in modular design applications with an in-house, multi-disciplinary engineering team consisting of 300+ in-house engineering, design, and drafting staff.

INTEGRATED ENGINEERING

Propak's engineering team is fully integrated with fabrication, field construction and aftermarket services. Our engineering facilities are co-located with our modular fabrication shops allowing for effective and efficient communication.

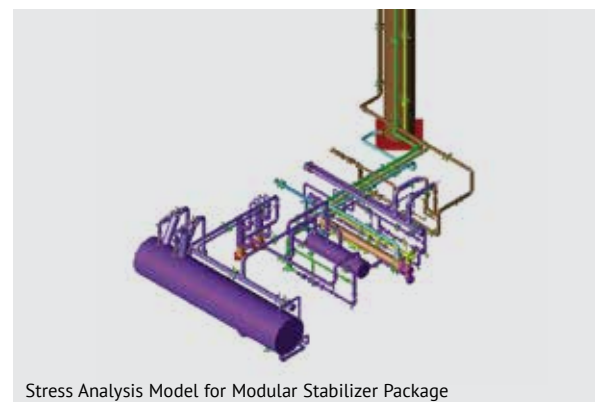
In early project stages, fabrication and field construction personnel provide valuable design input to provide our customers with the best solutions that can be efficiently manufactured and installed at site.

In later project stages, engineering personnel are directly involved in the quality process with in-progress fabrication reviews providing real time engineering support.

Our customers benefit from this integrated EPFC approach as traditional interfaces between engineering, procurement, fabrication and construction are eliminated. Propak provides an EPFC solution with a single point of accountability to effectively and successfully execute energy projects of all magnitudes.

ENGINEERING CAPABILITIES FOR MODULAR DESIGN AND FABRICATION

- Proven leader in engineering for modular design and fabrication
- Modular design capabilities demonstrably minimizing overall project costs and project schedules, decreasing plant footprint and creating significant logistical advantages
- Logistical and transportation limitations considered in early stages of the design and engineering process



Stress Analysis Model for Modular Stabilizer Package



Multi-Disciplinary, Comprehensive Fabrication Engineering

COMPLETE CAPABILITIES

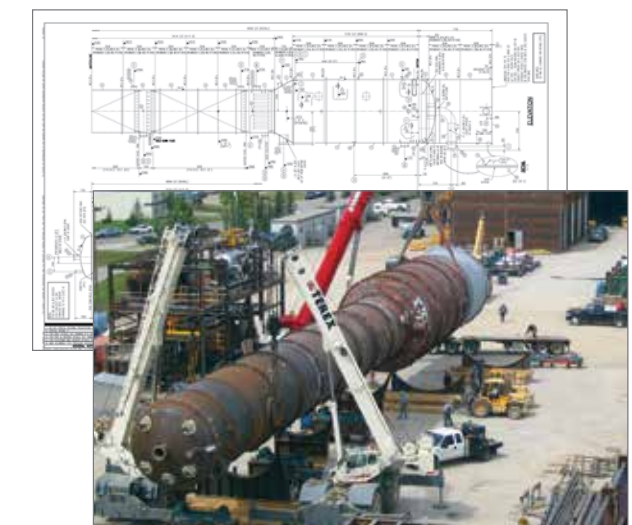
- Project Evaluations, Market Analyses and Sensitivity Analyses
- Project Feasibility Studies
- Pre-FEED Studies and Process / Technology Selections
- FEED (Front-End-Engineering-Design) Studies
- Project Management and Project Engineering
- Process Engineering and Design
- Mechanical, Piping and Structural Engineering
- Electrical, Instrumentation, and Controls Engineering
- Civil Engineering
- Project Controls and Scheduling
- Procurement, Expediting, and Supplier Management
- Detailed Engineering for Equipment Fabrication, Modularization and Field Construction
- Engineering for Commissioning and Start-up Assistance
- Plant Performance Testing, Facility De-bottlenecking Studies, Engineering Support for Aftermarket Services and Ongoing Management of Change Projects

PROJECT COST ESTIMATE EXPERTISE

- Firm price (lump-sum), or cost-reimbursable, or time & materials
- AACE Class 1 to Class 5 Estimates
- Catalogues of historical data on labour and material actual costs utilized in our estimates

WORKING TOGETHER COLLABORATIVELY

To provide our clients with the best, fit-for-purpose solutions, we encourage the end user's project team (including engineers, operators, and maintenance personnel) to work collaboratively with us throughout the project. During the design phase, input from those who operate and maintain our products is of utmost value. To further promote a collaborative approach to project execution, Propak has ample facilities to house both Propak and client project team members in a common office space. This facilitates easy communication through critical project stages from design through to fabrication and in-progress quality reviews.



Propak is Modular Fabrication



Propak is one of the largest builders in Canada and internationally of fully modular energy processing facilities and of individual oil and gas processing and treatment units. We are the experts that build completely modular process facilities with skid-mounted components. We have extensive facilities and a large skilled labour force connected to local, urban, and international supply chains, in the heart of oil and gas country. Modular fabrication reduces field construction, provides highly skilled labour in a productive environment, and reduces project costs and schedule, while improving project cost and schedule certainty.



Project Execution Requirements

Procure Fabrication Materials

Fabricate Process Equipment & Modules

Propak

Gas Processing	Heavy Oil	Compression & Power	Standard Equipment Packages	Heat Recovery & Steam
Major Buyout & Fabrication Materials	Major Buyout & Fabrication Materials	Major Buyout & Fabrication Materials	Spec & Stock Packages: Gas Processing Units Heavy Oil Processing Units Power Generation Units Compression Units Well Pad Facilities	Major Buyout & Fabrication Materials
Modular Fabrication	Modular Fabrication	Modular Fabrication		Modular Fabrication



Trial fit of Triple Deck Deethanizer Unit, 60 ft high completed



De-Methanizer Tower Leaving the Propak Large Vessel Plant, 134ft - 6in S/S, 278,000 lb



Multi-Disciplinary Modular Fabrication

Modular Fabrication

Propak's expertise in modular fabrication has proven effective in lowering overall project costs, improving overall project schedule, reducing field construction and field warehousing requirements, utilizing skilled labour pools in urban areas, and increasing quality and productivity through fabricating in a controlled environment.

Propak focuses on optimizing the level of modularization and minimizing exposure to potential cost escalation associated with field construction. This provides our clients with cost and schedule certainty.

PROPAK MODULAR FABRICATION ADVANTAGES

- Modularization significantly reduces field construction costs, lowering overall costs and making projects feasible in adverse conditions or construction environments
- Piping and assembly completed on package shifting field mechanical contractor scope from stick building facility to setting modules and bolt ups
- Examination and pressure testing performed at Propak decreasing field activity disruption during hydro testing (particularly during cold weather) and radiography testing
- Instrumentation and electrical heat trace wiring terminated to skid edge junction boxes reducing cable pulls (through use of multi-conductors) and improving efficiency of field terminations
- Remote I/O capability for in-shop marshalled instrumentation wiring and pre-commissioned control loops eliminating majority of control field terminations and cable pulls, and decreasing field commissioning activities
- Modules trial fit ensuring streamlined site installation
- Logistics simplified through shipment of assembled modules from Propak instead of large quantities of bulk materials from multiple sources
- Transportation limitations for each project location considered throughout engineering design and fabrication
- Modules standardized and repeated further increasing project efficiencies
- Schedule minimized through fast tracking – overlapping phases of engineering, procurement, fabrication and construction
- Assistance and feedback promptly provided from all disciplines of engineering during fabrication, due to vertical integration of engineering and fabrication
- Quality enhanced due to manufacturing in controlled conditions with highly experienced and permanent work force trained to established processes and procedures
- Work performed in fabrication shop environment achieving higher efficiency and productivity with optimal arrangements for activities, labour and equipment
- Equipment long-term value improved with the ability to move modules to new locations

FABRICATION CAPACITY FACTS

- Nominal 1.5 million man-hour annual shop capacity
- 700,000 sq ft of facilities
- 80 acres of yard space
- Full integration of engineering design and OEM manufacturing
- Tradesmen in all fabrication disciplines on staff, with many years of experience fabricating modular skids and equipment
- In-house electrical and control panel shop
- In-house programming, plant controls and simulation
- All work monitored by Propak's integrated quality control department

REGISTERED WELDING PROCEDURES

Propak has registered in-house welding procedures that are available for client review upon request. Some of the registered welding procedures include but are not limited to: GMAW (Gas Metal Arc Welding); GTAW (Gas Tungsten Arc Welding); SAW (Submerged Arc Welding); SMAW (Shielded Metal Arc Welding); and FCAW (Flux Cored Arc Welding).

SPECIALIZED OTSG FABRICATION

Our OTSG manufacturing facility implements specialized processes involved in OTSG tube fabrication. Finning of heat transfer tubes is done using a proprietary process that was developed by IST. This unique method of brazing fins to tubes promotes effective heat transfer and reduces corrosion effects.

FABRICATION CERTIFICATES

Propak Systems has authorization from American Society of Mechanical Engineers (ASME) and Canadian Standards Association (CSA) authorities to construct, repair, or alter the following equipment types:

- Construct, repair, or alter ASME Section I boilers, Section VIII Div. 1 & 2 pressure vessels including national board member states (U1, U2, UM, S, R, NB stamps)
- Construct, repair, or alter ASME B31.1 power piping and B31.3 pressure piping
- Repair or alter boiler external piping (S Stamp)
- Weld and inspect structural steel components per CSA W47.1 and W59
- Construct ASME boilers and pressure vessels for export under the Safety Quality Licensing System, to export boilers and pressure vessels for use in the People's Republic of China

SHIPPING CAPACITIES

Propak is experienced in shipping to markets throughout the world, with expertise to coordinate land, sea and air shipments from our Airdrie facilities.

Propak is Electrification & Electrical Fabrication



Modular Electrical Building Fully Assembled and Tested

Electrical Equipment Product Line

ELECTRICAL BUILDINGS (E-HOUSES)

Propak provides Electrical Buildings (E-House) packages for a variety of Energy Processing facilities. Propak Electrical Buildings are prefabricated transportable modules, Intertek Approved (CSA or UL Alternative) and designed to house the following types of Electrification and Controls equipment:

- MV and LV Switchgear, MV and LV Motor Control Centers, and Power Distribution
- Smart/Intelligent Motor Control Centers
- Paralleling Switchgear and Automatic Transfer Switch (ATS)
- Variable Frequency Drives and Reduced Voltage Soft Starters
- 120/208V Distribution Panels
- Uninterruptable Power Systems
- DCS, Marshalling, PLC Control, and SCADA Panels
- Fiber-optics, assembled by Certified Fiber Optic Technicians (CFOT)
- HVAC Systems
- Instrument Air Packages, Generators

Electrical Building applications include:

- Central Facility and Offsites Electrical Buildings
- Prime Power Generator Paralleling Switchgear Buildings (Recip. and Turbine)
- Compressor / Pumping Station Sync Transfer VFD Buildings
- Combination Modularized Process and Electrical Buildings

Each Electrical Building is engineered to meet the customer's requirements with respect to integration into the facility, equipment layout, physical footprint, future capacity and transport requirements. Our fully integrated, turnkey EPFC model allows for Propak Electrical Engineers to have an exhaustive understanding of all immediate Electrical Building design impacts.

Electrical Building fabrication, from structural and mechanical design through to electrical assembly occurs at Propak's modular fabrication facilities.

Each Electrical Building is delivered as a completely developed, manufactured, assembled, and pretested module that can be deployed much quicker than typical electrical room designs.



Compressor Station Sync Transfer VFD E-House



Control Panel Preprogramming and Testing Prior to Shipping

ELECTRICAL AND CONTROL PANEL FABRICATION, ASSEMBLY AND INTEGRATION

Propak has vast experience in Electrical and Control Panel Design, Fabrication, and Assembly for the energy processing industry.

Propak is capable of completing many types of Intertek Approved (CSA and UL Alternative) Hazardous Location and General Purpose custom panels, including but not limited to:

- Facility PLC Panels
- Remote I/O Panels
- DCS Panels
- DCS Marshalling Panels
- Compressor Panels
- SCADA / RTU Panels
- Communication Panels
- VFD / Motor Control Panels
- Lighting Contactor Panels
- Heat Trace Controller Panels
- SCR (Heaters) Control Panels
- Instrument Tubing Panels
- Junction Boxes

Point-to-Point Panel Factory Acceptance Testing (FAT) is conducted on all panels in Propak's panel shop prior to transferring to the modular fabrication facility.

To save time during field construction and integration, and to streamline the commissioning and start-up process, panels can also be pre-programmed and tested prior to shipment of the process or equipment module.



Complete Modular E-House in Transport to Site



MODULE ASSEMBLY SHOPS – AIRDRIE, AB

Propak's 404 and 925 Shops specialize in pipe spooling and module assembly. The skilled workforce includes a full complement of trades: welders, pipefitters, millwrights, insulators, crane operators, instrumentation technicians, electricians, painters and general laborers.

With a combined approximately 450,000 sq ft shop capacity, the majority of Propak's modular assembly work is completed indoors in a controlled shop environment with available overhead cranes.



LARGE & SMALL PRESSURE VESSEL MANUFACTURING PLANTS – AIRDRIE, AB

The 505 Shop specializes in manufacturing large pressure vessels, exchangers, air coolers and other oil and gas processing equipment. This shop also houses Propak's CNC Plasma steel plate cutting table and CNC Pipe Cutting and Profiling machine utilized in manufacturing a variety of custom pressure vessel and structural steel components.



MODULE ASSEMBLY AND TRIAL FITTING YARDS – AIRDRIE, AB

Propak's Airdrie locations include four large outdoor yard spaces situated adjacent to the Assembly Shops. Yard space totals approximately 80 acres and includes large flat concrete pads used for accurate trial fit-ups of pipe rack and equipment modules.

With Propak's available space, completed modules are often staged for transportation to site in convoys to facilitate efficient setting and field installation.



OTSG MANUFACTURING PLANT – CAMBRIDGE, ON

IST's head office in Cambridge includes a modern, fully integrated manufacturing facility that produces site specific, ready to install Once Through Steam Generators for enhanced oil recovery, power, process and combined heat and power plants.

OTSG manufacturing facilities include proprietary heat transfer tube finning which allows for high density finning; and specialized tube bending.

STRUCTURAL STEEL SHOP – AIRDRIE, AB

The 226 Shop specializes in structural steel fabrication. This includes the manufacture of Propak's standard and custom modular skids and pipe racks. Steel is cut utilizing a Robotic CNC Plasma steel beam cutter increasing productivity and efficiency.

The 226 Shop is located adjacent to the 404 Assembly Shop allowing for easy transfer of completed structural skids and steel components for modular assembly.



ENGINEERING OFFICE FACILITIES – AIRDRIE, AB

Propak's main offices are the 440 and 925 buildings housing the Gas Processing, Compression & Power, and Heavy Oil Business Units. Propak's engineering, drafting, and procurement facilities are in close proximity to Propak's fabrication shops allowing for effective communication and throughout the project.

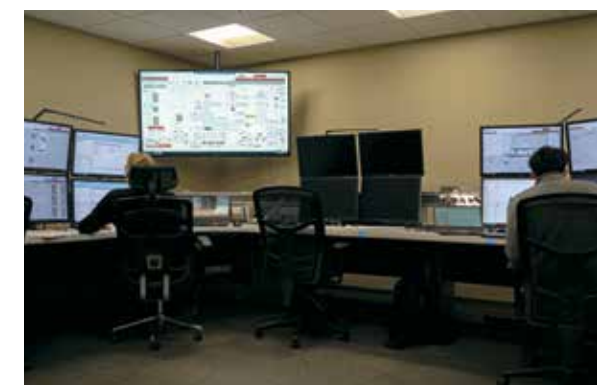
Propak's large office capacity facilitates execution of projects including large energy processing plants.



CONTROL SIMULATION ROOM – AIRDRIE, AB

Propak's 925 building houses a Control Simulation Room which is used for performing facility control system program simulations. As this is located in an engineering office, multi-disciplinary support is available during Factory Acceptance Testing.

This room can be set up to mimic a client's site control room providing a useful resource for program testing and operator training.



ELECTRICAL AND CONTROL PANEL SHOP – AIRDRIE, AB

Propak's Airdrie facilities includes an in-house electrical and control panel shop. This shop builds a variety of standardized and custom panels ranging in scope from simple electrical panels up to large remote I/O and PLC control panels.

Having this shop in-house provides a level of standardization across Propak's product lines and allows for further efficiency in module fabrication.



Propak is Construction Services



Contact

ppclinquiries@ppcl.ca | 403.912.7000



Propak Field Construction Services

Process Plant Constructors Limited (PPCL) is a wholly owned subsidiary of Propak Systems, providing domestic and international field construction and construction management services to meet our customers' needs. PPCL offers an integrated turnkey construction solution including field construction and logistics services for Propak's facility installations around the world.

The Propak / PPCL integrated relationship eliminates the traditional interfaces between Engineering, Procurement, Fabrication, and Construction which, if not managed correctly, can be a source of cost and schedule issues. This relationship allows for schedule consolidation meaning that fabrication and construction activities can be coordinated to optimize the installation process and provide fast tracking opportunities.

PPCL construction management personnel are members of Propak project teams. From early engineering stages, Propak's facilities are designed with constructability in mind. PPCL personnel contribute in key 3D model and constructability reviews with their expertise in

field installation efficiencies, while simultaneously gaining familiarity with the facility design aiding in field construction.

PPCL provides direct hire personnel for mechanical, electrical and instrumentation / controls labour trades for site construction and site safety management.

CONSTRUCTION TRADES

- Pressure Piping "B" Welders
- Rig Welders
- Pipefitters
- Iron Workers
- Millwrights
- Electrical & Instrumentation
- Controls & Programming
- Equipment Operators
- General Labourers

Process Plant Constructors Ltd.

Project Execution Requirements

Construct & Install the Unit or Plant

Commission & Startup to Operation

Gas Processing	Heavy Oil	Compression & Power	Standard Equipment Packages	Standard Equipment Packages
Construction & Construction Management	Construction & Construction Management	Construction & Construction Management	Construction & Construction Management	Construction & Construction Management
Installation Pre-Commissioning, & Startup	Field Supervision & Commissioning	Field Supervision & Commissioning	Field Supervision & Commissioning	Field Supervision & Commissioning

CONSTRUCTION MANAGEMENT SERVICES

- Construction Supervisors
- Maintenance Supervisors
- Safety Coordinators
- QA / QC Inspectors
- Field Planners / Schedulers
- Materials Control / Expeditors
- Warehouse Personnel
- Logistical services for domestic and international shipping and transport
- Construction indirect services and facilities including camps



Propak is Energy Services



Contact

parts@propaksystems.com | service@propaksystems.com
1.877.PROPAK1 (1.877.776.7251)



Propak Energy Services

Propak Energy Services (PES) is Propak's integrated field services and replacement parts division. PES keeps your compression and energy processing facilities operating at optimal levels, both domestically and internationally.

COMPRESSION & POWER SERVICES

PES provides service for gas compression and power generation equipment, including warranty service, minor and major maintenance, replacement parts and equipment exchange, through a network of service locations throughout Western Canada and the United States Rocky Mountain region.

The company maintains a fleet of fully equipped service trucks with factory-trained service technicians who understand the life cycle of critical components.

PES also employs certified commissioning technicians for the Caterpillar 3600 and Waukesha 275 series of engines.

PROCESS FIELD SERVICES

PES provides after-market service for process equipment and facilities including warranty, maintenance, repairs, troubleshooting, revamps, custom fabrication, turnarounds and shutdowns. In cooperation with Propak

Engineering, we are able to provide plant optimization, feasibility studies and de-bottlenecking services.

PRODUCT LINES SERVICED

Ariel; Caterpillar; Cooper; Dresser-Rand; EnDyn; Gemini; Howden; Mycom; Sullair; Waukesha; White Superior; Worthington

ENGINE AND CYLINDER HEAD EXCHANGE SERVICES

PES maintains a complete range of natural gas engine and compressor rebuilt exchange components designed to minimize downtime. Work is performed by factory-trained technicians and all exchange components are covered by a PES rebuilt warranty. Mycom compressor exchanges are also available.

Propak has a fully equipped engine cylinder head shop specializing in Waukesha, Caterpillar and White Superior engines.

AFTER-MARKET PROGRAMMING SUPPORT

Propak's in-house control systems specialists provide long term control system support. This includes support for programming, software and panel hardware for a variety of control system types and manufacturers.

Propak Energy Services

Project Execution Requirements

Commission & Startup to Operation

Supply Equipment, Parts & Service for Plant Operation

Gas Processing	Heavy Oil	Compression & Power	Standard Equipment Packages
Installation Pre-Commissioning, & Startup	Field Supervision & Commissioning	Field Supervision & Commissioning	Field Supervision & Commissioning
Equipment, Parts & Field Support Service	Equipment, Parts & Field Support Service	Equipment, Parts & Field Support Service	Equipment, Parts & Field Support Service

COMPRESSION & POWER SERVICES

- Equipment preventative and routine maintenance contracts
- Compressor package modifications, retrofits and revamps
- In-shop or on-site overhauls and revamps
- Failure analysis
- Engine and compressor exchanges
- Programming / panel upgrades and support
- Instrumentation services
- Generator maintenance and troubleshooting
- Equipment and component repair, parts and exchange

PROCESS FIELD SERVICES

- Plant troubleshooting, turnaround and optimization services
- Facility refurbishment
- Operator training
- Equipment preventative, routine maintenance and repairs
- Process piping and vessel modifications and repairs
- Cooler re-tubing and repairs for aerial and shell & tube coolers
- Direct fired heater re-rating and burner management
- Direct fired heater coil, burner and refractory repairs
- Tower inspections and re-traying
- Mycom screw compressor parts and service



Propak Engine Cylinder Head Machine Shop



Propak Energy Services On-Site

Propak is OTSG Aftermarket Services



Contact

service@otsg.com | 519.740.0757



Aftermarket Services

Innovative Steam Technologies (IST) is a world leader in industrial steam technology that designs and manufactures Once-Through Steam Generators (OTSG). IST offers aftermarket services to all makes of Heat Recovery Steam Generators (HRSGs), and OTSGs, including Enhanced Oil Recovery units (EOR) and Waste Heat Boilers (WHB).

BOILER ENGINEERING & FIELD SERVICES

- HRSG / OTSG / EOR / WHB Engineered Upgrades and Retrofits
- HRSG / OTSG / EOR / WHB Repairs
- HRSG / OTSG / EOR / WHB Erection Assistance
- HRSG / OTSG / EOR / WHB Turnkey Erection
- Start-up & Commissioning Services
- Field Technical Support
- Material Upgrades and Enhancements
- Selective Catalyst Reduction (SCR) System Retrofits

BOILER INSPECTION SERVICES

- Overall condition assessment
- Inspect components for cracking, failure, thinning and wear
- Identify operational problems
- Identify flow-accelerated-corrosion (FAC) problems
- Root cause failure analysis
- Inspect for vibration or expansion problems
- Repair procedure recommendations
- Identify design and fabrication defects and inadequacies



PERFORMANCE ANALYSIS AND MODELING

- Cycling, Dynamic and Finite Element Analysis
- Computer Performance Modeling and Analysis
- Flow Modeling
- Circulation Analysis
- Noise / Acoustic Evaluation



Propak

Project Execution Requirements

Commission & Startup to Operation

Supply Equipment, Parts & Service for Plant Operation

Heat Recovery & Steam

Field Supervision & Commissioning

Parts, Field Support Service Retrofits and Upgrades

PROCESS CONTROL

- Process Control Upgrades and Modifications
- Analysis of Existing Process Control Systems
- On-site Technical Support



Environmental Responsibility



New Zealand



Saskatchewan

At Propak, we make it our responsibility to understand our impact and implement ways to reduce our clients' environmental footprint. We continuously look for, and support our customers in, the application of the latest technological innovations to decrease resource use, maximize efficiency, and reduce emissions. Through these efforts, we help our customers in the energy industry continue to achieve a sustainable future.

Energy Processing Plant Design

- Efficiency:
 - Apply the best technology and processes available to optimize the use of non-renewable resources
- Modular Facility Design:
 - Minimize environmental impact through reduced plant footprint
 - Fabrication in a controlled environment is more efficient than traditional stick-built execution and allows for a shorter site construction schedule
- Emissions Control:
 - Emissions monitoring systems available
 - Low NOx burners are standard in all applications
 - Vapour recovery systems to contain and recycle low pressure waste gas streams
 - Improved flare and incinerator designs to ensure efficient destruction of released gases
- Produced Water Recycle:
 - Produced water treating and recycle for boiler feedwater in EOR steam generation available
- Efficient LED lighting standard across entire product line

- Process Heat Integration:
 - Optimize heat exchange between hot and cold process streams to increase efficiency and save fuel
- Noise Control:
 - Low noise enclosures and low noise cooler fan blades available
- Spill and Leak Control:
 - Lined storage tank containment areas to meet regulatory requirements in all jurisdictions
 - On-skid waste tanks and spill containment

Innovative Steam Technologies – SQ90™

The industry leading, patented, SQ90™ Once Through Steam Generator design produces 90% quality steam which provides a number of key benefits over typical industry standard OTSGs used in Enhanced Oil Recovery applications. SQ90™ provides, as compared to 80% quality competitor's designs:

- Improved Operation:
 - Reduced fuel consumption for the same dry steam production rate
 - Reduced blowdown for the same dry steam flow
 - Lower pumping energy use due to reduced feedwater flow rate
 - Reduction in chemical use due to less frequent pigging and less disposal well maintenance
- Reduced GHG Emissions:
 - Reduced emissions due to reduction in fuel consumption for the same usable steam production rate
- Improved Sustainability:
 - Reduced blowdown and feedwater rates result in reduced water recycle and source water treating volumes

OTSGs for Heat Recovery Applications

- Flexible design with dry-run capability and fast start-up process makes an excellent complement to intermittent renewable power sources
- Zero blowdown, no waste energy, no blowdown treatment
- No harsh chemical cleaning
- Single exhaust stack eliminates heat losses associated with bypass stacks and allows for simple integration of selective catalyst reduction (SCR) systems to reduce NOx emissions

Compliance

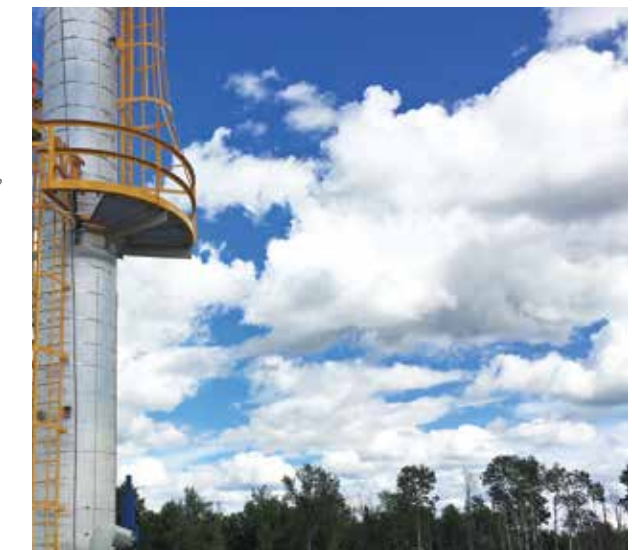
Propak's facilities are designed and constructed in accordance with applicable Statutory Requirements, Canadian Codes and Standards, and applicable Propak / Client Specifications, Standards and Operating Procedures. Propak's projects are executed in full compliance with environmental and jurisdictional regulatory standards, guidelines, directives and governmental acts.

Safety & Environment in Facility Design

Safety and environment in facility design are important aspects which are considered throughout the engineering and design process. Optimum designs are assured through a series of formal design review sessions.

P&ID and 3D model review sessions are conducted with the client at key project stages reviewing aspects of safety, operability, constructability and maintainability.

HAZOP / LOPA sessions evaluate potential process hazards and safeguards utilizing formalized methodologies. Facility designs are analyzed to ensure sufficient, effective and independent personnel safety and environmental protection measures are in place.



Social & Governance

Health & Safety



Propak, a private Canadian corporation, operates with more than 1,000 employees working in 20+ varied office, fabrication shop, warehouse, and field service locations. Conducting business in a socially responsible manner that protects the health and safety of our employees, clients, and the communities we operate in is of utmost importance as people are our greatest asset.

PROFESSIONAL & ETHICAL PRACTICE

Propak is committed to conducting our operations in accordance with the highest standards of ethical behaviour. Ethical conduct is observed in all of our activities along with local standards, human rights codes, sensitivities and practices including linguistic and cultural elements. Courtesy and politeness shall be the rule.

Propak maintains an array of policies, standards, processes and procedures that define our operations and outline the expected behaviours of our staff. These policies include but are not limited to: Conflict of Interest, Harassment and Discrimination, Information Systems, Personal Information Protection, Health and Safety, Anti-Corruption, and Whistleblower.

PROPAK EMPLOYEES

Employee development is a priority at Propak. Employees have access to multiple training sessions and seminars, provided by Propak's internal training department covering a wide range of diverse topics. Propak also actively supports and encourages our staff to seek out and pursue professional development opportunities to ensure we as a company remain at the leading edge of the latest developments in our industry.

Constant on-the-job training, feedback and supervision is provided to all workers. To build capacity for the future, labourers are encouraged to become apprentices in their chosen trade.

CORPORATE STRUCTURE

Propak is a private Canadian corporation owned by our senior management. Being private allows for a greater level of control and thus permits a higher degree of flexibility. Without the short-term pressures and obligations typical of public companies, our clients benefit from Propak's stronger focus on long-term planning and objectives.

For private corporations that are owned by senior management, there is a vested interest in company performance and product quality. Propak upholds a reputation of providing high quality services to our clients through continuously meeting our commitments.

COMMUNITY

Propak is actively involved in the communities where our employees live and where we do business. This includes sponsorship of local amateur sports, supporting many local charities through our annual events and encouraging our employees to do the same.

INDIGENOUS & COMMUNITY ENGAGEMENT

Propak endeavors to work with the local communities where we are constructing new facilities. We are dedicated to supporting these communities by providing direct and indirect employment opportunities through working with our clients, band offices and resource centres to help facilitate and support First Nations employment with Propak.

At Propak, we firmly believe the well-being of our people is fundamental to our success. Whether in the office, fabrication shop, or on-site, Propak is committed to a successful Safety Management Program that strives to protect our co-workers, clients, contractors, property, and the public with the goal of achieving zero incidents.

Propak's Safety Department's mandate includes ensuring legislative responsibilities are met in all jurisdictions where Propak works; keeping policies and procedures ahead of legislative changes; administering claims management and liability risk management; and maintaining compliance with our clients' safety requirements.

Propak's Safety Management Program is **"Actively Focusing on Prevention"** in our day-to-day work.



Propak upholds and promotes the responsibilities and accountabilities it has to legislative bodies such as OHS (Occupational Health & Safety), WCB (Workers' Compensation Board) and Alberta Transportation.

Our health and safety management program is maintained through annual audits measuring compliance as part of the Alberta Certificate of Recognition (COR) program.

Propak provides in-house safety training in many forms. This includes new hire and contractor shop orientations and a wide array of specific training courses relating to the equipment our employees use, the environments in which they work, and the materials that they may encounter.

ACCIDENT PREVENTION PRINCIPLES

Propak's safety management program encompasses the following inter-related elements that contribute to accident prevention:

Propak Health & Safety Policy & Company Rules	Incident Investigation & Reporting
Workplace Hazard Assessment & Control	Records & Statistics
Safe Work Practices & Job Procedures	Emergency Preparedness
Worksite Inspections	Legislation
Preventative Maintenance Program	Environmental & Hazardous Substances
Personal Protective Equipment	Commercial Vehicle Safety Program
Training & Communication	Corporate Policies

A Culture of Quality

Maintaining a high degree of quality is an imperative component in everything that Propak does for the full lifecycle of a project from inception, through engineering design, modular fabrication, field construction, commissioning, and start-up. We are creating a culture of quality to instill these values in all aspects of our operations.

We continue to explore how we can create and better a culture in which employees “live” quality in all their actions, where they are passionate about quality as a personal value rather than simply obeying the rules of the project and associated industry requirements.

TO EMBED QUALITY DEEP IN PROPAK'S COMPANY CULTURE, WE ARE FOLLOWING FOUR KEY FACTORS:

- **Leadership Emphasis:**
Propak's management teams instill a culture of quality through engaging with all disciplines throughout all stages of the project. Propak's integrated organization allows shop, construction and field service personnel to be involved in all project stages from initial reviews, through to lessons learned closeout sessions fostering an environment of continuous improvement.
- **Message and Communication Clarity:**
Open, transparent, clear communication is essential in all aspects of spreading the message about quality. Propak utilizes a variety of channels to communicate the importance of quality with employees at all levels in all departments across our organization.
- **Encouraging Peer Involvement:**
Propak relies on the engagement of its employees to advance all aspects of quality. From involvement in developing new internal process standards to asking detailed questions to the engineering teams and suggesting design improvements, employees at all levels are encouraged to get involved.
- **Employee Ownership of Quality Improvement:**
Propak's culture of quality requires employees to apply their skills and make decisions to foster an environment of continuous quality improvement.

Engineering Quality Assurance

Propak performs technical engineering work in accordance with our internal Professional Practice Management Procedures. These documents outline key aspects of:

- Propak's Management and Organization
- Our Ethical Standards
- Professional and Technical Resources
- Engineering Quality Control & Assurance Processes

Propak's procedures for engineering quality control and assurance define the requirements for originating, reviewing, and approving documents, engineering authentication and validation of documents, and document control and retention.

A formalized engineering quality process is imperative in the production of high-quality engineering documents and drawings. These processes are in place to ensure that our focus on quality is continuous and consistent across everything that we do. Propak's work often requires the input from multiple engineering disciplines. Implementing a thorough, multidisciplinary, documented review process is essential in producing high-quality engineering. Propak's quality processes are routinely discussed at all levels from management to new employees to foster our culture of quality.



Quality Management System



Fabrication Quality Management

Propak has a full-service, in-house quality assurance and quality control group which is integral to Propak's fabrication and construction activities. Propak's deep commitment to quality while fostering an environment of continual improvement allows our company to be an industry leader in the engineering, design, construction, repair, and alteration of equipment for oil and gas processing and steam generation.

Propak has an established and certified ASME Quality Management System in place that defines the quality requirements relating to the manufacture of pressure vessels, boilers, and pressure piping.

Quality control in fabrication and field construction is managed by Propak's quality group. Propak has exceptional quality control personnel in all areas of administration, technical support, document control, discipline inspection and weld procedure development.

Propak's Quality Management System also allows for customization of quality inspection scope to suit specific project requirements. This facilitates a client focused approach to quality.



Process Control Activities

From file initiation to drawing review, from material control to final shipping inspections, our focus is ensuring the integrity of the product. Propak's quality inspectors carry out in-process inspections and mapping, verification of documentation, integrity testing and product verification to all applicable codes of construction.

With Propak's integrated engineering and fabrication, the interface is efficiently managed with engineering personnel participating in inspections verifying project and process specific requirements are met.

QUALITY MANAGEMENT ELEMENTS:

- Detailed internal procedures, work instructions, inspection test plans, quality plans, project execution plans
- Design control, drawing control, material control, welding control, pressure testing verification, manufacturing tolerances
- Discipline inspections for vessel fabrication, piping fabrication assembly, structural steel fabrication and erection, material verifications, mechanical inspections
- Inspection utilizing direct visual, remote visual (boroscope)
- Non-destructive inspection methods such as RT, UT (including phased array UT), MT, PT, HT and PMI

Propak Systems Ltd.

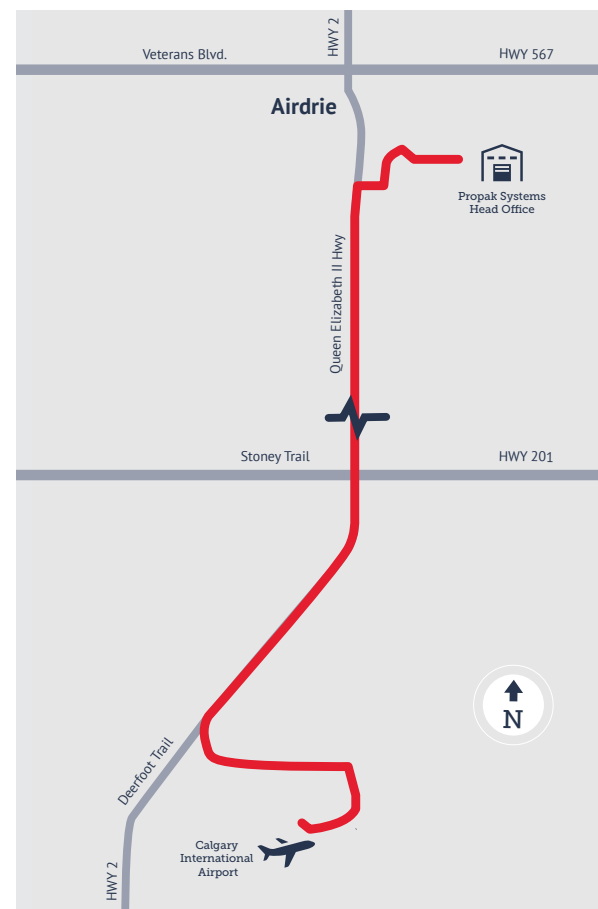


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heavyoil@propaksystems.com
ppclinquiries@ppcl.ca
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service@propaksystems.com
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Airdrie Offices & Facilities

Engineering & Sales

(Head Office, Building A)
 440 East Lake Road NE
 Airdrie AB, Canada T4A 2J8

Finance, HR

(Building F)
 204 East Lake Road NE
 Airdrie AB, Canada T4A 2J8

Modular Assembly Shop, Purchasing Office, Receiving

(Building B)
 404 East Lake Road NE
 Airdrie AB, Canada T4A 2J8

PPCL Shipping / Receiving

(Building G)
 704 East Lake Road NE
 Airdrie AB, Canada T4A 2J5

Warehouse & Small Pressure Vessel Shop

(Building C)
 405 East Lake Road NE
 Airdrie AB, Canada T4A 2J7

Large Pressure Vessel Shop

(Building H)
 505 East Lake Boulevard NE
 Airdrie AB, Canada T4A 2G3

Maintenance Service Shop

(Building D)
 3 East Lake Circle
 Airdrie AB, Canada T4A 2J6

Engineering, Propak Energy Services,

Modular Assembly Shop
(Building I)
 925 Veterans Boulevard NE
 Airdrie AB, Canada T4A 2G6

Structural Steel Shop

(Building E)
 226 East Lake Road NE
 Airdrie AB, Canada T4A 2J8

Exceeding Customer Expectations

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Fax: 403.528.3543

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Fax: 403.528.3543

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Phone: 306.773.6116
Fax: 306.773.6303



Fast-Track Solution for Total Austral S.A.

CUSTOMER PROJECT REQUIREMENTS

Total Austral S.A. urgently required a turnkey 290 MMSCFD natural gas processing plant at a remote South American location to meet imminent sales delivery commitments. Customized solutions for process and treatment were necessary to meet high product performance standards.

PROPAK SOLUTION

Propak achieved start up within 10½ months from project sanction, surpassing product performance and project schedule requirements. The plant was fully modularized: the modules were fabricated in 18-24 weeks, arriving on site on week 32. Plant start up was 117 days from the arrival of the first modular skid on site.

Propak accomplished this fast-track schedule within budget on 60,000 man-hours of engineering and drafting; 130,000 man-hours of modular fabrication; and 352,000 man-hours of construction management and construction on site in South America. Modular fabrication reduced construction manpower requirements to 250 construction workers, from an estimated requirement of 500 workers for a conventional “stick-built” plant.

The key to meeting the tight delivery and budget schedule was Propak’s overlapping integration of disciplines in a total EPFC solution. The project required a supplier with complete process and project engineering capabilities, outstanding technical competence, the capacity to build a fully modular plant and expertise in construction. Propak drew on its proven energy processing experience and its signature competencies to surpass client expectations.

PROJECT SPECS

Turnkey 290 MMSCFD hydrocarbon refrigeration and dew point control plant, producing 6200 bbl/d of stabilized condensate. In addition to the process plant, Propak’s scope included construction of temporary construction shops, a work-camp to house up to 500 local workers, and permanent camp facilities and office infrastructure.

Major Process and Treatment Units and Plant Systems: 2700 hp Gas Chilling Train; 1400 hp Stabilization System; 20 MMBtu/h Hot Oil System; 9.6 MW Power Generation System; Fire Water System; SCADA; Radio and Telemetry System; DCS.

Propak Services: Process Design, Detailed Engineering, Procurement, Modular Fabrication, Construction Management and Supervision, Construction, Commissioning, Start-up.

THE CLIENT’S RESPONSE

Total Austral S.A. wrote a letter to express their sense of Propak’s achievement. The letter offers their “*greatest congratulations*” for Propak’s “*very significant contribution to the success*” of the project.

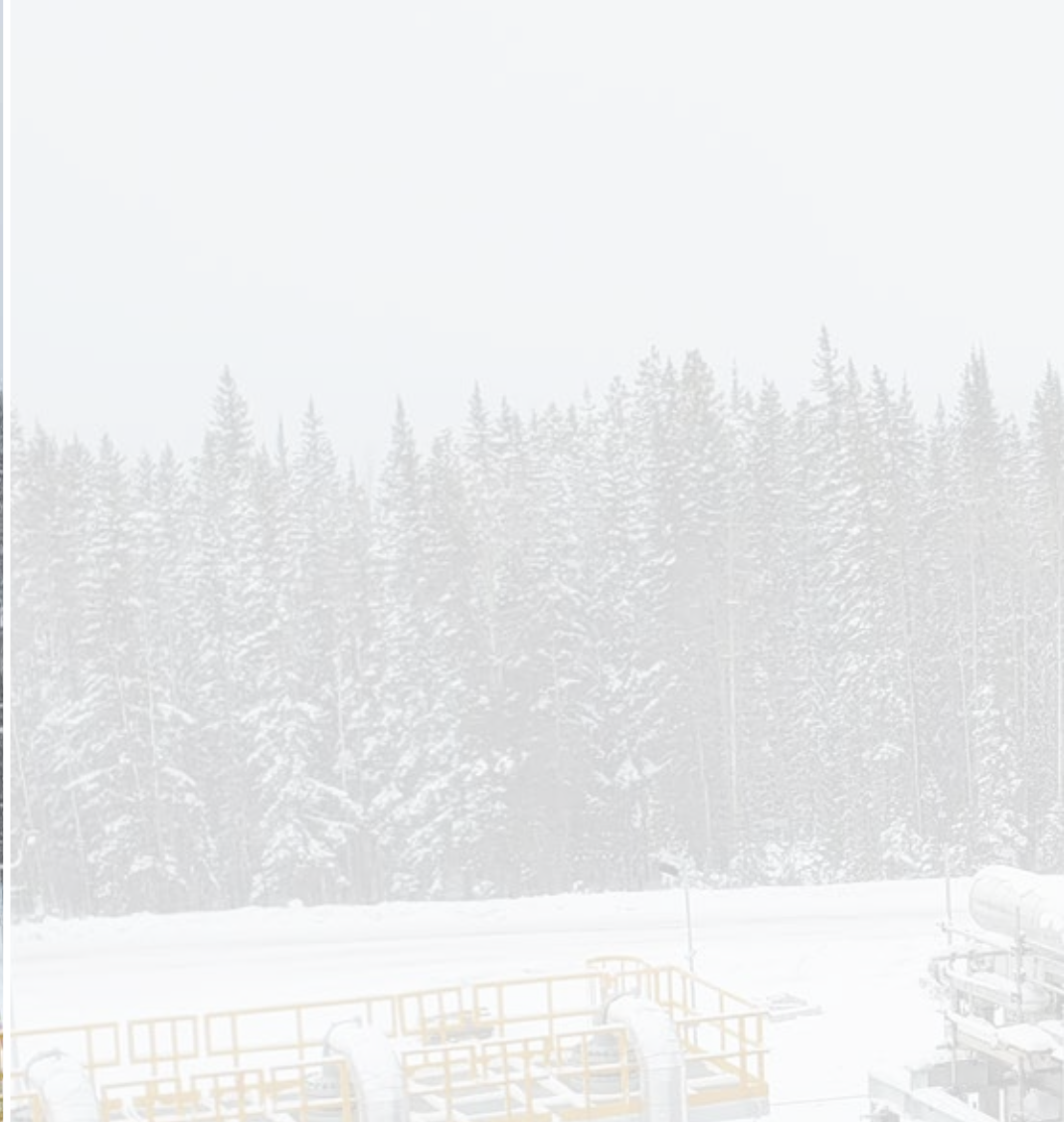
“Ten and a half months from contract award to start up for a complex turnkey development; 117 days from the arrival of first skid at site to start up...[these are achievements] that not many, if any, other contractor can claim in their reference list.”

“Total Austral is proud to have selected Propak for the development [of this project], and look forward to new opportunities to pursue such a fruitful partnership.”



Propak has built hundreds of energy processing plants and thousands of process, treatment and compression units worldwide.

- | | | | | | |
|------------|--------------------|------------|-------------|--------------|----------------|
| Algeria | Chad | Ghana | Libya | Romania | Uganda |
| Argentina | Chile | Hungary | Malaysia | Russia | Ukraine |
| Australia | China | Indonesia | Mexico | Saudi Arabia | United Kingdom |
| Bahrain | Colombia | India | Myanmar | South Africa | USA |
| Bangladesh | Czech Republic | Iraq | New Zealand | Spain | Venezuela |
| Barbados | Dominican Republic | Israel | Nigeria | Switzerland | Yemen |
| Belgium | Ecuador | Italy | Norway | Tajikistan | |
| Bolivia | Egypt | Japan | Pakistan | Thailand | |
| Brazil | France | Kazakhstan | Poland | Turkey | |
| Canada | Germany | Kuwait | Puerto Rico | Turkmenistan | |



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