

Calpine Canada Ltd - Calgary

- Acquisition review of a sour gas facility including sulphur plant.

Canada Northwest Energy Limited - Varadero, Cuba

- Waste Heat Recovery System Study: fuel gas used to feed turbine driven electric generator which fed major tourist needs at Varadero beach. The soft water from the battery would be pumped to recover heat from the turbine exhaust and the produced steam would be used at the battery for process needs.
- 10 MMSCFD Gas Plant Study: 300 gpm amine sweetening, refrigeration, compression, 35 T/D sulphur plant.
- Completion, workovers, production and operations management for an 11 well field (10° API) including liaison with Cuban regional officials. Responsibilities included co-ordination of office, field and contract services.
- Responsible for the detailed engineering for a 10,000 B/D facilities upgrade comprising a gathering system, test/metering/pump stations and major treating facility c/w ship loading facilities. Also, a comprehensive feasibility study was done that examined the economic scenarios for phased expansions to 40,000 B/D.
- Operations review and troubleshooting on and amine and IFPEX facility.

Devon Canada Corp (formerly Anderson)

Leland

- Engineering review of a 60 MMSCFD sour dehydration facility (31% H₂S).
- Installation of replacement salt bath heater, sulphur meltout system.
- Operations support and plant performance studies.

Coleman

- FEED study to debottleneck the existing sour gas plant to process up to 100 MMSCF/d inlet gas. The plant process includes inlet separation, condensate stabilization, regenerative sweetening (Sulfinol), desiccant hydrocarbon and water dewpoint control and sulphur conversion through a dual train Claus process and single train Superclaus process. Secondary plant systems included in the evaluation included the flare system and 15/50/150/400# utility steam system.

Inuvialuit Energy Inc. - Rainbow Lake

- Rated the existing plant and determined the modifications necessary to process 15 MMSCFD additional gas.
- Prepared and evaluated equipment specifications and bid packages.
- Prepared the bid documentation for the construction of 48 km of 8" Ø sour gas pipeline and 16 km of 6" Ø sweet gas pipeline.
- 40 MMSCFD sour gas plant: Supervised complete turnaround activities including the rebuild of the sulphur plant and the installation of a new inlet separation package and deethanizer package.

Nexen Canada Ltd - Balzac

- Gas plant operations and maintenance engineering support including process optimization support, AFE costing, project scheduling and control and equipment procurement services.
- Detailed engineering and installation supervision for new pumps and redesigned piping systems for Truck and Railcar LPG loadout.
- Provided engineering support for 2002 turnaround including: Supervisory engineering support for sulphur pit rebuilding, design of new sulphur pit eductor system, design modifications to sulfreen unit, process piping and vessel upgrades.
- Detailed engineering with pipe stress calculations and field installation supervision for a new expansion loop to the steam and liquid sulphur piping systems in the VAT area of the plant.
- Feasibility studies for a 230% plant expansion to 160 MMSCFD including field data collection, plant simulation, cost estimation and definition of required plant modifications.

Pembina Resources Limited - Diamond Valley

- 400 B/D debutanizer performance upgrade and 20 MMSCFD turbo-expander performance review.
- Sulphur plant facility review and appraisal.

Placer Cego - Medicine River

- Sulphur facility review and design modification implementation.

Polish Oil and Gas Company - Dębno, Poland

- Design basis memorandum and project specifications for a 55 MMSCFD sour gas plant including fractionation and sulphur plants. Economic evaluation of 200 cum/d fractionation train options.
- Project management of a US \$70 million gas plant development involving 21 wells and the production of 45 MMSCFD gas, 6000 BPD oil, 120 t/d sulphur, 600 BPD LPG and 200 BPD condensate.
- Fabrication and construction inspection.
- Pipeline system design and evaluation.
- HAZOP evaluation. Start-up and operations support.
- Training – plant management and Dębno Plant Operations personnel.



Polish Oil and gas Company – Dębno, Poland

Polish Oil and Gas Company - Zielin, Poland

- Project management of Zielin plant expansion.

Samson Canada Ltd. - Medicine Lodge

- Detailed design through procurement, construction management to start-up of a relocated, retrofitted refrigeration package, dehydration system, inlet separation facilities of an existing 100 t/d sulphur plant and gas facility.
- Installation of 500 HP two stage booster compressor.

Sherritt International Corporation - Varadero, Cuba

- Phase 1 (US 20 million) - Responsible for the re-engineering, 25% of the procurement, 50% of project management, 100% of construction troubleshooting, commissioning and start-up for a 35 MW gas-fired power generation facility involving a 110 kV substation, a GEMS6001 turbine, and two 25 km transmission lines. A 15.5 MMSCFD gas plant - 25% mechanical design, 50% of the procurement, commissioning and start-up by GLE. The design provided recovery of 192 bbl/d of LPG and 133 bbl/d of condensate as well as 40 t/d sulphur.
- Phase II (US 30 million) - Responsible for 75% of the engineering, 75% of the procurement, 75% of the project management and 100% of the commissioning and start-up for a 70 MW gas-fired power generation facility involving two GEMS6001 turbines and a 25 km transmission line. A 27.5 MMSCFD plant - 25% of mechanical design, 50% of procurement, commissioning and start-up by GLE - supplied the gas feed. The design provided recovery of 413 bbl/d of LPG and 286 bbl/d of condensate as well as 70 t/d sulphur.
- Phase III (US 100 million) - Responsible for the detailed engineering of the interfaces between three supplemental fired 400+ MMBTU/hr waste heat recovery boilers and the three GE-MS6001 gas-fired turbine generators. Also primary responsibility for engineering of the reverse osmosis (176 US gpm) water treatment system and its interface with the steam generation system, detailed engineering of the interfaces between the steam turbine generator/condenser/cooling water, and detailed engineering of the sea water intake and water desalination make-up. Field procurement of the equipment.

Sherritt Power Corporation - Boca de Jaruco, Cuba

- Phase IV - Responsible for the engineering, procurement, project management, commissioning and start-up for a US \$15 million, 35 MW gas-fired power generation facility involving a 110 kV substation, a GEMS6001 turbine and a 5 km transmission line. A 15 MMSCFD gas plant designed by GLE supplied the gas feed. The design provided for recovery of 166 bbl/d of LPG (C₃ & C₄) and 115 bbl/d of condensate as well as 15 t/d sulphur.
- Integrated within the Cuba projects were the interconnection of the substations into the UNE National grid and the upgrading of the communications link to microwave. This modification became the backbone of a whole new system in Cuba and involved the MMI remote control interface in Havana, towers and the transmission system.



Sherritt Power Corporation – Boca de Jaruco, Cuba

Wascana Energy Inc. - Balzac

- Sulphur facility review including upgrades to sulphur pit eductor and liquid storage vent system design.
- Flare system upgrade and compressor addition.
- Project engineering for the optimization, debottlenecking and reconfiguration of a sour gas plant totaling in excess of 12,000 HP.



Wascana Energy Inc. - Balzac