

## Partial Projects List

### LARGE SCOPE MULTI-DISCIPLINARY PROJECTS

**TATA STEEL MINERALS CANADA, SEPT-ÎLES, QUEBEC** - Sandvik Mining and Construction – Provide electrical engineering and equipment supply for an iron ore crushing plant.

**PT ADARO, INDONESIA, TUTUPAN OPCC (COAL MINING EXPANSION PROJECT)** - FLSmidth – Design and supply of a total of 13 Secondary Resistive Controllers (SRCs) for starting, running, jogging and load sharing for 5 Conveyors with multiples of 800, 900 and 1400 kw drives. Also, provided a complete Engineering supply package for the conveyors and 2 overburden crushing stations (OCSs) complete with 2 apron feeders and 2 discharge conveyors.

**CONSOLIDATED THOMSON IRON MINES (CLIFFS), POINTE-NOIR, QUEBEC** - Sandvik Mining and Construction – Provide electrical engineering and equipment supply for an iron ore stacker/reclaimer.

**STANDARD GENERAL CONSTRUCTION, ACHESON, ALBERTA** - ZJ SOLUTIONS – Provide a complete electrical engineering package for an aggregate unloading, conveying and stockpiling facility.

**STANDARD GENERAL CONSTRUCTION, WHITECOURT, ALBERTA** - ZJ SOLUTIONS – Provide electrical engineering and equipment supply for an aggregate stockpiling, reclaim and rail loadout facility.

**WESTSHORE TERMINALS, VANCOUVER BRITISH COLUMBIA** - Sandvik Mining – Provided the complete electrical engineering and equipment supply package for a Sandvik supplied 7,100 tph stacker/reclaimer.

**PENASQUITO - GOLDCORP, MEXICO** - FLSmidth – Provided the complete electrical engineering and equipment supply package for an FLSmidth supplied crushing plant complete with apron feeder.

**MINERA CHINALCO, PERU, SA TOROMOCHO PROJECT** - FLSmidth Boise – Design and supply of electrical and control equipment for new overland conveyor system at 5000m elevation including electrical rooms for a 2 x 1400kW conveyor and a 3x2250kW conveyor as well as associated instrumentation, control and PLC programming. Conveyors are driven by the latest CST technology.

**SHELL CANADA (AOSP UPSTREAM EXPANSION PROJECT)** - Colt – Design and supply of electrical and control equipment for 14,000 tph Surge Feed Conveyor and two 7,000 Tph Breaker Feed Conveyors, over 13,000 total connected HP. Included supply of E-House, Motor Control Centers, four (4) 2600kW and two (2) 1120kW wound rotor motors, each with Secondary Resistive Controllers (SRC), PLC and communications equipment, PLC programming and HMI integration support, lighting.

**MINERA ESCONDIDA (W9), CHILE** - SKM – Design and supply of electrical and control equipment for Conveyor and Crusher relocation project involving seven (7) conveyors, two (2) crushers and a bin feeder, over 15,000 total connected HP. Included supply of three (3) E-Houses, six (6) Motor Control Centers, Secondary Resistive Controllers (SRC) for each of three (3) 1200kW wound rotor motors, PLC and communications equipment, PLC programming and HMI integration support, lighting, bulk materials.

**MINERA ESCONDIDA (NORTE), CHILE** - Hatch – Design and supply of electrical and control equipment for in-pit 750kw gyratory crusher, 7.6 km of overland & distribution conveyors. Including four (4) E-Houses, main control room, large drive motors, Secondary Resistive Controllers (SRC), PLC and communications equipment, PLC programming and HMI integration support, etc.

## Partial Projects List, continued

**MINERA ESCONDIDA (E3), CHILE** - BHP Engineering – Design and supply of electrical and control equipment for relocation of two (2) existing in-pit crushing / conveying systems. Included supply of two (2) new E-Houses, motors & Secondary Resistive Controllers (SRC) complete with PLC and communications equipment, PLC programming and HMI modification to integrate into existing ore distribution system.

**SYNCRUDE CANADA (AURORA 2)** - AMEC – Engineer, design and manufacture two (2) electrical houses for Surge Bin Feed Conveyor and Mix Box Free Conveyor, including installation of Syncrude purchased equipment.

**MINERA ESCONDIDA (NORTE), CHILE** – Preliminary engineering for Crushing and Conveying electrical control system.

**MINERA ESCONDIDA (E2/E3), CHILE** – Preliminary engineering for Crushing and Conveying electrical control system.

**MINERA ESCONDIDA (PHASE IV), CHILE** - Bechtel – Design and supply electrical equipment for in-pit crusher and discharge conveyor, including two (2) Ehouses, master control room, large drive motors, PLCs, HMI, etc. Design and supply electrical equipment for overland conveyor system, including four (4) large Ehouses, 1 x 1200kW Wound Rotor Induction Motor (WRIM) and 7 x 2000kW Wound Rotor Induction Motors (WRIM), PLCs and switchgear.

**LAFARGE CANADA** – Design, supply and installation of complete materials handling system for the expansion located on Texada Island.

**MINERA ANTAMINA, PERU** - Sandwell – Engineering, design & manufacture of complete electrical system, including control, communications and power for a 1600 TPH ship loader for Huarmey Port Facility.

**SYNCRUDE CANADA (NORTH MINE EXPANSION PROJECT)** – Engineer, design and manufacture of (2) two electrical houses for North Mine (E-Houses #1 & 3), including resistors and Rotor Contactor Cabinets. Install Syncrude purchased equipment.

**HIGHLAND VALLEY COPPER, CANADA** - Design and supply of nine (9) - 800HP frequency drives systems including frequency drives, transformers, motors and PLC control systems for a new tailings pumping station.

**HIGHLAND VALLEY COPPER, CANADA** - Design, manufacture and supply of a new overland conveyor drive system with a new improved PLC control system, switchgear, secondary resistors, contactor cabinets and 3 WRIMs.

## POWER DISTRIBUTION PROJECTS

**ENPOWER GREEN ENERGY LTD., CANADA** – Design and supply of two 35 kV switchgear buildings for waste energy recovery project.

**GIBRALTAR MINES LTD., CANADA** – Design and supply of four 25 kV - 7.2 kV mobile pit substations 7500 kVA.

**GENERAL ELECTRIC, CANADA** – Assemble 13 skid mounted construction power substations.

**WESCO DISTRIBUTION, CANADA** – Design and supply of 25 kV Outdoor service entrance switchgear for Save-On- Foods warehouse.

**KEWIT FLATIRON, CANADA** – Design and supply of 25 kV Outdoor service entrance switchgear for Port Mann bridge construction power.

## Partial Projects List, continued

**SIMILCO MINES LTD, CANADA** – Design and supply of Two 25 kV – 7.2 kV mobile pit substations 7500 kVA for the Copper Mountain mine.

**SIMON FRASER UNIVERSITY, CANADA** – Design and supply of 15 kV Metalclad switchgear and misc. LV equipment for power system upgrade.

**THOMPON CREEK ENDAKO MINES, CANADA** – Design and supply of three outdoor skid mounted arc resistant substations.

**ATLAS COPCO DRILLING SOLUTIONS INC., CANADA** - Design and supply of 7200 V Switchgear assemblies for PV-351 and PV-270 drill rigs.

**TERRANE METAL CORP, CANADA** – Design and supply of four open pit substations and one MCC room for the Mount Milligan mine.

**CEDAR ROAD LFG, CANADA** – Design and supply of outdoor substation for a landfill gas generation project.

**VICTORIA SHIPYARDS, CANADA** – Design and supply of 25 kV outdoor switchgear assembly for DND submarine maintenance facility.

**CENTERM (BCR MARINE), CANADA** – Design and supply of four (4) aluminium housed 15kV substations for refrigerated container storage area.

**BILFINGER BERGER (CANADA) INC.** – Engineering and supply of 15 kV power distribution equipment for construction power for twin 7.8 kM long tunnels. Project consists of Power distribution engineering and manufacturing of one (1) surface substation, one (1) main underground substation and six (6) underground skid substations.

**PATTON AND COOKE CO., CANADA** – Design and supply of three (3) 6kV outdoor switchgear skids for Chador Malu iron mine in Iran.

**CENTENNIAL TERMINAL (P&O PORTS CANADA)** – Design and supply of one (1) aluminium housed 15kV substations for refrigerated container storage area.

**VANCOUVER AIRPORT, CANADA** – Design and supply of extension to existing 25kV substation switchgear.

**MINERA ANTAMINA, PERU** - Sandwell – Design and supply of substations for Huarmey Port Facility.

**P&H HARNISCHFEGER (LUSCAR COAL)** – Design & manufacture of switchgear for new 9020 Dragline (25KV, 6.9 KV & 480V).

**SYNCRUDE CANADA** – Engineering, design and manufacture of two (2) electrical houses for North Mine (E-Houses #6 & 8), including installation of Syncrude-purchased equipment.

**MINERA ESCONDIDA, CHILE** – Upgraded the emergency generator control system, conducted a safety audit on the generator substation and recommended repairs and modifications.

**MINERA ESCONDIDA, CHILE** – Implemented site coordination relay study, including relay testing and calibration.

**HIGHLAND VALLEY COPPER, CANADA** – Design and supply two (2) emergency diesel generator sets, 95kW & 75kW c/w tandem axle trailers & outdoor weatherproof electrical panels.

## Partial Projects List, continued

**SYNCRUDE CANADA** – Engineering services for an additional four (4) electrical houses.

**HIGHLAND VALLEY COPPER, CANADA** – Design, manufacture and supply of a special 2000 KVA mobile diesel generator set for moving mobile mining equipment and guaranteed to be capable of across the line starting of a 1000 HP generator set.

## DRIVE SYSTEMS PROJECTS

**POTASH CORPORATION OF SASKATCHEWAN** - Stantec – Design and supply of two (2) 200kW Switched Reluctance motors and drives complete with Falk gear reducers, Vortec cooling system, air compressor package for underground high speed load out conveyor. Operation is unique with multiple start/stops and rapid acceleration and deceleration rates under varying load conditions.

**FREEPORT McMORAN CHINO MINE** - Switchgear Solutions – Retrofit four (4) 3500Hp Secondary Resistive Controls (SRC) for dual drive mill applications with 80-100% continuous speed control at full load, replacing liquid rheostats.

**SYNCRUDE CANADA (NMAPS 9A)** - AMEC - Retrofit of five (5) 1250HP Secondary Resistive Controllers (SRC) for conveyor application with future consideration given to automatic load sharing specifically tar sands.

**SYNCRUDE CANADA (NMAPS 2A)** - AMEC - Retrofit of Five (5) 1250HP w 1350HP Wound Rotor Induction Motors & Secondary Resistive Controllers (SRC) for conveyor application with a specially designed automatic load sharing function for tar sands.

**SYNCRUDE CANADA (SWQR)** - AMEC - Six (6) 1250HP Wound Rotor Motors (WRIM) & Secondary Resistive Controllers (SRC) & two (2) E-House packages for two (2) conveyors.

**P.T. FREEPORT INDONESIA** - One (1) 400HP conveyor Secondary Resistive Controller (SRC) & Wound Rotor Induction Motor (WRIM).

**HIGHLAND VALLEY COPPER** - Replacement of Squirrel Cage Induction Motor System with a Wound Rotor Induction Motor (WRIM) & Secondary Resistive Controller (SRC) for a 350HP critical conveyor application.

**P.T. FREEPORT INDONESIA** - Two (2) 900kW Wound Rotor Induction Motors & Secondary Resistive Controllers (SRC) for conveyor acceleration & jogging (creep).

**P.T. FREEPORT INDONESIA** – Six (6) 600HP Wound Rotor Induction Motors (WRIM) & Secondary Resistive Controllers (SRC) for acceleration and jogging three (3) conveyor applications.

**SYNCRUDE CANADA (AURORA 2)** - AMEC – Design and supply of wound rotor & resistor equipment for Surge Bin Feed Conveyor & Mix Box Feed Conveyor, each 3 x 1250HP.

**ATACAMA KOZAN, CHILE** - Edyce – Supply two (2) 350kW Secondary Resistive Controllers (SRC) and one (1) 400kW Secondary Resistive Controller (SRC) for Belt Conveyors.

**MINERA ESCONDIDA (OXIDE), CHILE** – Replacement of fluid coupling conveyor drives with 2 x 850kW Wound Rotor Induction Motors (WRIM) and Secondary Resistive Controllers (SRC) for mine upgrade project.

**P.T. FREEPORT INDONESIA** – Wound Rotor 1000HP Crusher & 800HP Conveyor Secondary Resistive Controller (SRC) for mine expansion. Conveyor application included jog feature.

## Partial Projects List, continued

**HIGHLAND VALLEY COPPER, CANADA** – Six (6) 1250HP Wound Rotor Motor Slurry Pump Drives with speed control at 13.8kV, replacing existing VFD pump drives.

**FLENDER (MUSKEG RIVER-ALBIAN SANDS), CANADA - MRC** – Three (3) 2600kW conveyor Secondary Resistive Controllers (SRC) drive package and three single 800kW conveyor drive packages for the tar sands.

**EL ABRA, CHILE** – Design, manufacture, supply and commissioning of dual 900 kW Secondary Resistive Controller (SRC) drive system.

**SOUTHERN PERU COPPER (CUAJONE), PERU** – Engineering, design & manufacture of Secondary Resistance Controller (SRC) for 800HP Crusher.

**HIGHLAND VALLEY COPPER, CANADA** – Engineer and supply drive system for L2D Conveyor using the Synergy-designed Secondary Resistance Controller (SRC) and 450HP wound rotor motor, 4160V, 1200 RPM.

**SYNCRUDE CANADA** – Design and supply custom manufactured Resistors and Rotor Resistor Contactor Cabinets for 1250HP & 900HP Wound Rotor Induction Motors.

**HIGHLAND VALLEY COPPER (A-AUTO MILL MODERNIZATION), CANADA** – Engineer, design, manufacture, install and commission of a twin 4000HP Mill Drive System, for GE Quadratorque motors.

**HIGHLAND VALLEY COPPER, CANADA** – Design, engineer and supply 750kVA Portable Substation c/w 4160V, 12.5kA circuit breaker, 750kVA ONAN transformer 4160V-600Y/347 and 600V low voltage section.

**HIGHLAND VALLEY COPPER, CANADA** – Engineer, manufacture and install Cyclo Converter to operate 2 x 4000HP SAG and Ball Mill Motors, using Synergy-licensed, advanced technology.

**HIGHLAND VALLEY COPPER, CANADA** – Design & supply new 700HP Crusher SRC's for improved reliability.

**SYNCRUDE CANADA** – Design and supply custom manufactured Resistors and Rotor Resistor Contactor Cabinets for 1250HP & 900HP Wound Rotor Induction Motor.

**SYNCRUDE CANADA (NORTH MINE EXPANSION PROJECT)** – Custom design secondary resistor starting system for Rejects Conveyor (Electrical House 1J) and Crusher Conveyor (Electrical House 1G) using Synergy's proprietary RDSP (Resistor Design Software Program).

**MINERA ESCONDIDA (E1), CHILE - BHP Engineering** – Design, engineer and supply four (4) conveyor drive stations, controlling a total of ten (10) - 1200 kW motors.

**HIGHLAND VALLEY COPPER, CANADA** – Upgrade all original conveyor systems originally supplied in 1986.

**HIGHLAND VALLEY COPPER** – Design & supply two (2) new conveyor drive systems each for 4 x 1500 HP Wound Rotor Induction Motors (WRIM).

**MINERA ESCONDIDA (PHASE III), CHILE - Fluor Daniel** – Detailed design and supply of four (4) pre-packaged conveyor drive stations in accordance with specifications from Fluor Daniel Chile. Total system: over 14,000 HP expandable to 21,000 HP.

**SYNCRUDE CANADA** – Engineering analysis of existing starting resistors and acceleration control schemes. Design of new improved system and turnkey supply, manufacture and installation of a new drive station, controlling 4 x 1250 HP Wound Rotor Induction Motors (WRIM).

## Partial Projects List, continued

**SIMILCO MINES, CANADA** – Design and supply of specialized dual inverter drive systems for 250 HP cyclone feed pumps.

## INSTRUMENTATION & CONTROL PROJECTS

**GIBRALTAR MINES, CANADA** – Upgrade of Mine Concentrator Fisher Provox DCS to a DeltaV control system complete with new DeltaV I/O, two dual head control room operator stations and one mobile remote wireless operator control station. Scope included system design, panel manufacture and assembly, configuration conversion, installation, commissioning and start-up support.

**MINERA ESCONDIDA (COLOSO), CHILE** - Sandwell – Upgrade of electrical control system in conjunction with mechanical upgrade for ship loader.

**MINERA ANTAMINA, PERU** - Bechtel – Automation of the coarse ore crusher, conveyors and stacker for the mine site, including complete system logic design, PLC programming and HMI design and development.

**HIGHLAND VALLEY COPPER, CANADA** – Redesign of PLC system and programming of new tailings pump station.