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Daniel Roberts is an E/I&C Engineer with over 8 years of experience in arc flash analysis, electrical testing & maintenance, and protective device coordination studies, and electrical design. After receiving his B.Sc. in electrical engineering at the University of Manitoba, he has worked in dozens of facilities in Canada in a variety of capacities. Demonstrated capacity in design, interpretation and presentation of engineering drawings, electrical schematics and literate in AutoCAD. Strengths in arc flash and coordination studies, as well as on-site testing/programming of various metering and protection devices. Excellent interpersonal communication skills with the ability to work well with others, both in supervisory or support roles. Knowledgeable in computer applications including Microsoft Word, Excel, PowerPoint, MS Project, SKM, and EasyPower.

## **EDUCATION**

2006                      B.Sc. Electrical Engineering, University of Manitoba, Winnipeg, MB

## **EXPERIENCE**

**April 2007-June 2010    Magna Electric, Winnipeg, MB**  
**Electrical Engineer, E.I.T.**

**June 2010-Present      AMPS SERVICES Inc., Winnipeg, MB**  
**E/I&C Engineer, P. Eng.**

## **◆ ENGINEERING PROJECTS**

### **◆ New Britannia Mine, Snow Lake, MB – 2016 (ongoing)**

#### **◆ Mine Site Power System Review (2016)**

- ◆ Onsite review and data collection of existing surface infrastructure. Distribution modeling for short circuit and coordination of protective devices. Report of condition of existing equipment, suggestions for testing and confirmation of past switchgear modifications.

- ◆ **Thompson Creek Minerals, Mount Milligan, BC – 2014 (ongoing)**
  - ◆ **Ball Mill Drive and site Troubleshooting (2016 - ongoing)**
    - ◆ Remote and onsite troubleshooting of two ABB ACS6000 VFDs. Coordination with Mill control staff to determine origin of Mill shutdown faults. Network GE Multilin interface to obtain triggered fault data from multiple sites/origins.
  - ◆ **Site Wide Arc Flash Study (2015 – 2016)**
    - ◆ Onsite data collection, modeling, analysis, and report. Arc Flash label application.
  - ◆ **Main Substation Grounding Study (2015)**
    - ◆ Substation grid resistance testing of existing ground conductor and rod configuration. Recommendation of additional rods to tie into existing grid. Modeling of existing grid configuration and onsite assistance with placement of new rods including GEM backfill.
  - ◆ **54MVar filter bank troubleshooting (2014)**
    - ◆ Troubleshooting of SATEC PFC controller settings & uploading parameters.
    - ◆ Adjustment of stage timing to minimize plant disturbance and overvoltages.
  - ◆ **Power System Review (2014)**
    - ◆ Coordinated power system review with CIMA+ of multiple issues (equipment specification, configuration).
  
- ◆ **VALE, Thompson MB (2013 - ongoing)**
  - ◆ **Load Flow Modeling of Orica loads (2016)**
    - ◆ Birchtree Mine T-Line load flow modeling for possible relocation of Orica load fed from Smelter substation. Multiple line configurations and loading conditions simulated in software model.
  - ◆ **Site Wide Power Factor Correction Assessment (2015)**
    - ◆ Assessment of future PFC requirements based on existing load profile and future decommissioning of Smelter and Refinery.
  - ◆ **T-3 378 Substation 3MVAR PFC Review & Commissioning (2015)**
    - ◆ Review of de-tuned PFC bank and recommendation of tuning changes and design considerations. Commissioning of the PFC: creation of SEL751 relay settings, PFC controller settings, onsite assistance with general switchgear testing and PFC operation.
  - ◆ **T-3 2580L Main Breaker Retrofit (2015)**
    - ◆ Design and commissioning of 5kV main breaker retrofit into existing switchgear. Relay settings and onsite commissioning assistance.
  - ◆ **Power System Modeling (ongoing)**
    - ◆ Updates to the existing SKM model of various projects completed by AMPS. Future integration of projects completed by Vale and others.
  - ◆ **T-3 310 FAR Electric Heat (5MW) - 2014**

- ◆ Modifications to existing distribution equipment to meet CEC, changes to Telemecanique TSX PLC logic, coordination study and settings applied (ABB SACE breaker, Startco SE-325), system commissioning, VAMP 221 arc flash relay commissioning, SKM modeling and arc flash labels applied.
- ◆ **T-1 235 FAR Control Upgrade - 2014**
  - ◆ Specification of purge function burner controller & associated modules, modifications to existing ladder logic for burner control, drawing updates.
- ◆ **T-3 Shower Upgrade - 2014**
  - ◆ Removal of old control and shower equipment. Specification of new shower columns and industrial mixing chamber. Specification of control equipment and required modifications. Drawing updates.
- ◆ **Rod & Ball Mill Switchgear - 2014**
  - ◆ **Design**
    - ◆ Electrical equipment specification, layout, protection coordination settings, arc flash hazard settings, implementation of upstream trip logic.
  - ◆ **Commissioning**
    - ◆ Verification of testing procedures and results, troubleshooting arc flash light detection fiber, secondary injection witness testing of SEL 751A and Multilin 369 relay setpoints. Witness testing of SE-330 NGR protection relay.
- ◆ **Gerdau, Selkirk MB (ongoing)**
  - ◆ **12.47kV Pole mount reclosers (2015 - 2016)**
    - ◆ Detailed design for arc flash mitigation of downstream 600V switchgear. Construction package for three locations for new MV reclosers, arc flash relays, and associated control to reduce incident energy at the LV switchgear.
- ◆ **Griffin Wheel, Winnipeg MB (ongoing)**
  - ◆ **Power Quality & Load Measurements (2015)**
    - ◆ Shutdown coordination of 3 different main distribution points over 2 shutdown periods to obtain 20 main and feeder loading conditions over a 1-2 week period. Report of results and suggestions for future load growth and mitigation of existing overloaded conditions.
  - ◆ **Site Reclamation (2015)**
    - ◆ Site reclamation of fire damage. Assistance with onsite staff in the construction, sizing, and protection of new and existing equipment.
- ◆ **Other Work**
  - ◆ **Wyatt Oil, Carlyle, SK (2015)**
    - ◆ Onsite data collection for as-built single line diagram and relevant arc flash hazard data. Suggestions for future expansion considerations and power requirements.

- ◆ **Magellan Aerospace Bus Duct - 2014**
  - ◆ Review of previous test results and onsite inspection of multiple Bus Duct installations. Recommendation report.
- ◆ **AECL Pinawa, MB - 2013**
  - ◆ Design of Battery Bank and charging equipment replacement. Specification of new equipment, ventilation requirements, configuration options.
- ◆ **Hylife Foods, Neepawa MB - 2013**
  - ◆ Power quality measurements (Hioki 3196) of main four distribution feeders. Data collection of facility for power system modeling.
- ◆ **Louisiana-Pacific, Minitonas MB - 2014**
  - ◆ Arc flash hazard review of facility. Data collection of main feeder protection settings and additions to facility since previous study. Report on recommendations and changes in arc flash incident energy.
- ◆ **CFB Shilo, Shilo MB - 2014**
  - ◆ Maintenance testing of main substation equipment. Transformer (TTR, winding resistance, capacitance bridge, oil & wdg temp, oil sample), main breaker (insulation & contact resistance), circuit switcher (insulation & contact resistance, operational checks), ground switch (contact resistance, operational checks).
- ◆ **Boeing Canada, Winnipeg MB (2012 – ongoing)**
  - ◆ **4000A 600V Cable Bus Construction Package (2015 – 2016)**
    - ◆ Site verification of 25kV breaker control, MV & LV distribution equipment, new LV cable bus orientation and assist with structural approach and requirements. Creation of construction package for removal of existing bus duct and MV breaker control relays, installation of new cable bus and SEPAM relay.
  - ◆ **Site Arc Flash Analysis (2015-2016)**
    - ◆ Data collection, modeling, mitigation, and report of arc flash hazard levels for the Boeing Winnipeg site.
  - ◆ **25kV Breaker testing assistance (2015)**
    - ◆ Modification of relay settings protecting Ph1 Sub 6 main transformer. Upload and assistance, verification of main breaker & relay testing during shutdown.
  - ◆ **Autoclave PLC control upgrade (2012)**
    - ◆ Onsite data collection for as-builts of Autoclave starter and VFD wiring.
  - ◆ **Backup Generator distribution modifications (2014)**
    - ◆ Modification to distribution for backup generators for Autoclave and emergency feeders.
  - ◆ **Coordination Study (2013)**
    - ◆ 600V feeder coordination study to determine breaker trip setpoints of new feeder.

- ◆ **Kildonan Place Shopping Centre**

- ◆ **Power Quality Analysis & PFC Replacement (2014)**

- ◆ Onsite harmonic and power factor data sampling. Recommendation report and detailed design for de-tuned PFC units for East and West distributions.

- ◆ **Arc Flash Hazard Study (2013)**

- ◆ Data collection, modelling, analysis, and report for arc flash hazard analysis, short circuit, and equipment evaluation of the distribution system
    - ◆ Power quality study of the 600V East and West distribution harmonics and power factor. Used a Hioki 3196 PQM to measure each distribution harmonics. Report.
    - ◆ 600V Power factor correction design, layout, detuning requirements.

- ◆ **SAN GOLD CORP**

- ◆ **Dust Collection System - 2012**

- ◆ Installation of a new 200hp dust collector for the crushing plant. Upgrade of existing Crusher MCC and PLC. Programming parameters for Benshaw soft start, and protection relay settings for rotary airlock valve, positive displacement blower, and discharge arm. System commissioning and troubleshooting. Verification of motor sequence start, HMI feedback, and required interlocking.

- ◆ **Regrind Mill Replacement - 2012**

- ◆ 350hp Drive procurement, MCC upgrade to accommodate new Regrind Ball Mill Motor, commissioning drive

- ◆ **12.47kV Underground Feeder to 007 - 2012**

- ◆ Design, procurement, and onsite management of construction of the surface distribution switchgear and 3MVA portable mining substation. Hi-potting of HV cables.

- ◆ **PLC Audit of Automation Systems – 2012**

- ◆ Site wide audit of all PLC systems. Backup of existing programs on PLCs, smart overloads, VFDs, and HMIs.

- ◆ **Mill Low Pressure Compressor – 2012**

- ◆ Design, procurement, and managing the construction of a 250hp compressor addition to the Mill. Updating the electrical infrastructure to accommodate addition and supply existing loads.
    - ◆ Re-establishing transformer ground protection and NGR.

- ◆ **Raise Bore Hole Electrical Distribution – 2012**

- ◆ Design, procurement, troubleshooting, and managing the construction of the electrical distribution building servicing the fresh air raise for the Cohiba zone.

- ◆ **5kV Switchgear Upgrade – 2011**

- ◆ Protection coordination, arc flash analysis, programming of protection relays.

- ◆ **12.47kV Power Factor Correction – 2011 & 2012**

- ◆ Design and procurement of de-tuned 2.4MVAR power factor correction bank. Correspondence with MB Hydro to meet Power Quality Specifications.

- ◆ Troubleshooting bank from overheating issues
- ◆ **Power Monitoring of Electrical Distribution - 2011**
  - ◆ Real time data collection of metering devices and web reporting service using Ion Enterprise software.
- ◆ **12.47kV Main Switchyard - 2010**
  - ◆ Performed ground grid study, commission testing of breakers, cables, voltage regulators, and programming of protection relays. Arc flash analysis and coordination study. Procurement of materials for construction.
- ◆ **Site Work – 2010/2011**
  - ◆ Design and development of electrical infrastructure (Hinge, 007, Maintenance Shop, Crusher upgrades, Old Substation, additional camp installations) and site wide arc flash study.
  
- ◆ **St. Vital Centre, Winnipeg, MB**
  - ◆ **Arc Flash Hazard Analysis - 2012**
    - ◆ Data collection, modelling, analysis, and report for arc flash hazard analysis of the St. Vital Centre.
    - ◆ Analysis of several operating configurations, generation of TCC Curves, mitigation of high risk areas.
  
- ◆ **Stony Mountain Penitentiary, Stony Mountain MB**
  - ◆ **Site wide 12.47kV protection coordination & programming - 2012**
    - ◆ Modelling existing distribution and new equipment in SKM
    - ◆ Establishing new protection curves for proper device coordination
    - ◆ Programming new & existing S&C Vista switchgear for protection curves
  
- ◆ **Algonquin Power, St. Leon, MB**
  - ◆ **Power Quality Analysis - 2012**
    - ◆ Review of Wind Farm distribution system and data collection of power quality values (harmonics) using a Hioki 3196 Power Quality Analyzer
  
- ◆ **Atomic Energy of Canada Limited (AECL), Pinawa MB**
  - ◆ **5kV Power Factor Correction - 2011**
    - ◆ Design of 600kVAR 5kV PFC bank and wiring schematics
    - ◆ Programming 1 way on outdoor S&C Vista Switchgear
  
- ◆ **Border Chemicals - 2010**
  - ◆ Ground Grid modelling, Soft start modelling of 400hp motor and assessing power quality issues.

- ◆ Design, SKM modelling, programming, commissioning of new 15kV distribution gear

- ◆ **CG Canada - 2010**

- ◆ Design, modelling, relay programming, and commissioning of new underground distribution switchgear
- ◆ Increasing relay selectivity to mitigate potential future faults

- ◆ **KVA Dynamo - 2010**

- ◆ Data collection, modelling, and arc flash analysis of facility

2007 - 2010      **Magna Electric Corporation, Winnipeg, MB**  
**Junior Electrical Engineer, E.I.T.**

- ◆ **Arc Flash Hazard & Coordination Studies:**

- ◆ **VALE INCO, THOMPSON MB**

- ◆ Plant wide study of entire site (Surface and Underground)
  - ◆ Data collection, SKM modeling, Assumptions
  - ◆ Cataloging known and assumed data by multiple user-defined fields
  - ◆ Establishing and analyzing over 50 tie scenarios at 2 different fault levels
  - ◆ Creation of data sorting algorithms in Excel (Visual Basic)
  - ◆ Protective device coordination & arc flash mitigation
  - ◆ Creation of report, drawing package, labels, and electronic appendix

- ◆ **TransCanada Pipelines**

- ◆ 3 Pumping stations
  - ◆ EasyPower modelling, Assumptions
  - ◆ Creation of multiple tie and emergency generator scenarios
  - ◆ Analysis and determination of worst-case scenario values
  - ◆ Protective device coordination with arc flash mitigation considerations
  - ◆ Creation of report and associated appendices

- ◆ **Field Testing and Electrical Maintenance**

- ◆ Facilities:
  - ◆ Canexus Chemicals, Maple Leaf Foods, Koch Industries, Gerdau Ameristeel, HudBay Minerals, Crowflight Minerals, Wimpak, Regional Power, Erco Chemicals.
- ◆ Tests:
  - ◆ Hi-pot, Micro-Ohmmeter, VLF & Tan Delta, Transformer Turns Ratio, Capacitance Bridge, Winding Resistance, Breaker Timer.

◆ **Electrical Testing and Construction**

◆ **Griffin Wheel Canada**

- ◆ Replaced S&C 115kV fuse assemblies with Southern States assemblies.
- ◆ Replaced Eastern Power gang-operated 600A 15kV disconnects with S&C Alduti-Rupter 1200A 15kV gang-operated disconnects.
- ◆ Responsible for design and city permit, arrangements with MB Hydro, management of construction, and final commissioning.
- ◆ Thermographic survey upon re-energization.

**PROFESSIONAL DEVELOPMENT**

2012 Schneider Electric Unity Pro Level 2 Training, Winnipeg, MB, Canada  
2008 Schweitzer Engineering Labs Relay Training, Saskatoon, Sask, Canada

**ADDITIONAL TRAINING**

2010 QEW (Qualified Electrical Worker) Training, Winnipeg, MB  
2009 First Aid Training, Winnipeg, MB  
2009 Manitoba Hydro Safety Course, Stonewall, MB  
2008 Fall Arrest Training, Winnipeg, MB  
2008 Aerial Boom & Scissor Lift Training, Winnipeg, MB

**PROFESSIONAL ASSOCIATIONS**

Certified Technologist Technician Association of Manitoba – Technician – 2008 - Present  
Registered Professional Engineer with the Association of Professional Engineers and Geoscientists of Manitoba

**AMPS SERVICES INC.**

**Automation, Maintenance, Project & Supervision Services**

**Daniel Roberts, P. Eng.**  
B.Sc. Electrical Engineering  
E/I&C Engineer  
Industrial-Mining-Utility

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