

**Taras D. Semeniuk, M. Eng., P. Eng.**

Metallurgical engineer with over 30 years in the materials and metallurgical engineering field. Has a blend of education and practical field experience. Either lead investigator or forensic '*fingerprint*' specialist on incidents involving combustion turbines, pipelines, compressors, wind turbines, gas explosions, plumbing components, lift equipment or product liability.

**EDUCATION**

M. Eng. Metallurgical Engineering (Welding), University of Alberta	1996
B. Sc., Metallurgical Engineering, Materials Option (with distinction), University of Alberta	1994
Diploma, Materials Engineering Technology (honors), Northern Alberta Institute of Technology	1983

**PROFESSIONAL EXPERIENCE****ARC METALLURGICAL INC.****2006 to present****Metallurgical Engineering Specialist**

- Principal engineer responsible for metallurgical engineering and laboratories.
- Lead investigator or part of multidisciplinary team performing failure analysis or forensic engineering on industrial or commercial components both nationally and internationally.
- Forensic laboratory support to fire investigators and other engineers.
- Areas of personal specialty: fracture mechanics, welding/arc physics, gas-metal reactions, lift equipment, non-destructive inspection and wear resistant materials.
- Research: gas turbine high-temperature corrosion and pipeline leak erosion-corrosion.
- Material familiarity: superalloys, ferrous and non-ferrous metals, polymers, elastomers and ceramics.
- Typical assignments include combustion turbines, wind turbines, pipeline leaks and ruptures, reciprocating compressors, explosions and plumbing components.
- Expert witness in Alberta, British Columbia, Saskatchewan, Nova Scotia and New Orleans.

**SAMAC ENGINEERING LTD.****2000-2006****Metallurgical / Industrial Engineer**

- Lead investigator or part of a multidisciplinary team performing forensic engineering on industrial or commercial components.
- Responsible for metallurgical/industrial engineering and laboratories. Forensic laboratory support to fire investigators.
- Typical assignments involved combustion turbines, well blow-outs, pipeline leaks and ruptures, pipeline integrity research, compressors, mining equipment, engineering critical assessments, fuel cell espionage, residential explosions, plumbing failures and product

liability suits.

- Strain based fatigue assessments on sour gas reciprocating compressor and threaded piping.
- Expert witness in Alberta and British Columbia.

## **INDUTECH CANADA LIMITED**

**1998-1999**

### **Engineering Manager**

- Responsible for engineering and technical issues associated with manufacture of wear-resistant piping and induction bends.
- Liaise with customers to develop application-specific manufacturing methods.
- Innovative design of 'double head' overlay welding machine, including performance optimization and de-bugging.
- Limit states design of shop jib crane onto existing building structure.
- Implemented cost effective improvements to shop fabrication methods.

## **LUDWIG & ASSOCIATES ENGINEERING LTD.**

**1996-1998**

### **Metallurgical Engineer**

- Independently conduct failure analyses, welding research, machinery design and salvageability evaluations.
- Pipeline integrity investigation including field SCC verifications, laboratory analyses and fracture mechanics based life assessment.
- Primary consultant to Indutech Canada.
- Limit states design of multiple-configuration spreader bar.
- Engineering critical assessment (ECA) for alternate girth weld acceptance criteria for new pipeline construction in accordance with CSA Z662 Appendix K.
- Expert witness in Alberta.

## **NOVA GAS TRANSMISSION**

**Summer 1993/94/95**

### **Metallurgical Engineer**

- Performed failure analyses and material selection for pipeline, meter station and compressor components.
- Conducted research on submerged arc and gas metal arc welding consumables for new pipeline construction.
- Project management for fracture mechanics equipment for CSA Z662 new construction and Appendix K research.
- Contributed to manual for preservation and collection of field evidence.

## **CANSPEC GROUP**

**Summer 1992**

### **Senior Quality Assurance Inspector**

- Independently performed quality assurance inspections on pipe coating, oil storage tank rebuild, pulp mill and bridge.

- Prepared in-house manual for inspection and certification of lift equipment.

**BALL ASSOCIATES ENGINEERING LTD.**

**1984-1991**

**Area Manager**

- Responsible for administration, business development and project coordination for Calgary office.

**Senior Inspector**

- Inspection, modification and certification of lift equipment, buildings, draglines, mining equipment, amusement rides and drilling equipment.
- Quality Assurance on pipe, coatings, valves and heat exchanger.
- Non-destructive testing utilizing magnetic particle, radiography, ultrasonics, liquid penetrant and visual.

**Metallurgical Technologist**

- Performed laboratory and field technical work associated with failure analyses, insurance investigations and refractory testing.

**NDI (HARDY ASSOCIATES) LTD.**

**1983-1984**

**Senior NDT Technician**

- Inspection of valves, pressure vessels, pipe spools, buildings, bridges, draglines, corrosion surveys and wire rope.
- Non-destructive testing utilizing magnetic particle, radiography, ultrasonics and liquid penetrant.

**HARDY ASSOCIATES**

**Summer 1982**

**Junior NDT Technician**

- Inspection of pipelines, pressure vessels and drilling rigs using non-destructive testing utilizing: magnetic particle, radiography, ultrasonics and liquid penetrant.

**QUALIFICATIONS & PROFESSIONAL MEMBERSHIPS**

American Society for Metals (ASM) – Member

American Welding Society (AWS) – Member (retired)

American Society of Mechanical Engineers – Member (retired)

Association of Professional Engineers and Geoscientists of Alberta (APEGA) – Professional Engineer

Canadian General Standards Board: Magnetic Particle Level 3, Radiography Level 2, Liquid Penetrant Level 2, Ultrasonics Level 1

Canadian Welding Bureau (CWB) – Level III Welding Inspector: CSA Z662, W59, W47.1 (retired)

Fire Investigation Association of Alberta (retired)

Society of Automotive Engineers (SAE) – Member

## **SCHOLARSHIPS**

- Monnex Scholarship 1995
- Canadian Steel Industry Research Association Award 1994
- Albert Hanson Memorial Scholarship in Metallurgical Engineering 1993
- Alberta Prize 1983
- Hardy Associates Bursary 1982

## **RESEARCH**

- *Arc Instability in Mechanized Gas Metal Arc Welding*, University of Alberta, Master of Engineering Project 1996
- *Laser Assisted Gas Metal Arc Welding*, University of Alberta 1995
- *Submerged Arc Welding for Pipeline Steels*, University of Alberta 1994

## **GRADUATE STUDY COURSES, University of Alberta, 1994 – 1996**

- Fracture Mechanics
- Fracture of Metals
- Welding Metallurgy
- Welding Processes
- Quality Control of Weldments
- Stress Corrosion Cracking
- Pressure Vessel Design
- Structural Steel Design
- Laser Material Processing
- Quality Management II
- Scanning Electron Microscopy

## **INDUSTRY CONFERENCES, SEMINARS & COURSES**

*Stainless Steel Metallurgy*, ASM, Calgary, May 2013

*The Bolted Joint*, ASME, San Francisco, May 2011

*Design of Bolted Flange Joints*, ASME, San Francisco, May 2011

*Bolted Joint Assembly – Principles per PCC-1-2010*, ASME, San Francisco, May 2011

*Rationalization and Context of ASME Pre/Post Weld Heat Treatments*, ASM, Calgary, May 2010

*Threaded Fasteners and the Bolted Joint*, SAE International, Troy, August 2008

*Fundamentals of Metal Fatigue Analysis*, SAE International, Troy, August 2008

*Completions and Workovers*, ENFORM, Calgary, October 2006

*Acid Gas Compression & Injection*, Piece, Calgary, April 2006

*Electrical & Appliance Related Fires*, Fire Investigation Association of Alberta, Airdrie, March 2006

*Superalloys for Heavy-Duty and Aircraft-Type Gas Turbines*, BWD Turbines, Monterey, Sept. 2005

*International Pipeline Conference*, ASME, Calgary, June 2002

*Advanced Fire Investigation Course*, Canadian Association of Fire Investigators, Airdrie, October 2000

*6<sup>th</sup> Annual Materials Research Symposium*, University of Alberta, Edmonton, May 2000

*CIM Conference*, CIM, Calgary, May 1999

*International Pipeline Conference*, ASME, Calgary, June 1998

*Hardfacing in the Tar Sand Industry*, AWS, Edmonton, April 1998

*Corrosion Failures and Mechanisms*, NACE, Calgary, November 1997

*Pipeline Rehabilitation*, NACE/SSPC, Edmonton, January 1996

*Metal Standards & Specifications*, NACE/ASM/WIC, Edmonton, January 1994

*Corrosion & Metallurgy of Storage Tanks*, NACE/ASM, Edmonton, November 1993

*Rigging, Slinging & Crane Safety*, Alberta OH&S, Edmonton, May 1990

*Tank Lining Practices & Standards*, Bringas Technology Seminars, Edmonton, April 1990  
*Welding Codes & Metallurgy*, Bringas Technology Seminars, Edmonton, May 1989  
*Composites I – The Basics*, ASM, December 1986  
*Principles of Failure Analysis*, ASM, July 1986  
*Lubricants & Gear Failures*, ASLE Seminar, Edmonton, November 1985  
*Welding Metallurgy II*, NAIT, March 1985  
*CSA W47.1/W59*, CWB, Edmonton, February 1985  
*Weld Defects*, WIC, Edmonton, November 1984

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