

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

Metallurgical engineer with 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, cranes, pipelines, compressors, gas explosions, plumbing components 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 a multidisciplinary team performing failure analyses, forensic engineering or salvageability assessments on industrial or commercial components both nationally and internationally.
- Forensic laboratory support to fire investigators and other engineers.
- Areas of specialty include fracture mechanics, welding/arc physics, lift equipment, non-destructive inspection and wear resistant materials.
- Material familiarity includes superalloys, ferrous and non-ferrous metals, polymers, elastomers and ceramics.
- Typical assignments involve combustion turbines, pipeline leaks and ruptures, reciprocating compressors, valves, explosions and plumbing components.

SAMAC ENGINEERING LTD.

2000-2006

Metallurgical / Industrial Engineering Specialist

- Lead investigator or part of a multidisciplinary team performing failure analyses and forensic engineering on industrial or commercial components.
- Responsible for metallurgical/industrial engineering and laboratories. Forensic laboratory support to fire investigators, especially for electrical and mechanical components.
- 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 house explosions, plumbing failures and product liability suites.
- Strain based fatigue assessment of reciprocating compressor cylinder and threaded piping.

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 determine product suitability and application-specific manufacturing methods.
- Innovative design of 'double head' overlay welding machine, including performance optimization. Limit states design of shop jib crane onto existing building structure.
- Implemented cost effective improvements to shop manufacturing methods.

LUDWIG & ASSOCIATES ENGINEERING LTD.

1996-1998

Metallurgical Engineer

- Independently conducted failure analyses, weld procedure research, equipment design and salvageability evaluations.
- Performed pipeline integrity investigation, including field SCC verifications, laboratory analyses and fracture mechanics based life assessment.
- Retained as an expert witness for mediation regarding welded fabrication.
- Primary consultant to Indutech Canada.
- Limit states design of multiple configuration spreader bar.
- Contributed to engineering critical assessment in developing alternate girth weld acceptance criteria for new pipeline construction.

NOVA GAS TRANSMISSION

Summer 1993/94/95

Metallurgical Engineer

- Performed failure analyses and material selection for pipeline and compressor components.
- Conducted research on submerged arc and gas metal arc welding consumables for new pipeline construction.
- Project management and software review for fracture mechanics testing equipment.
- Contributed to development of a manual for preservation and collection of field evidence for failure analysis purposes.

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 an 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 projects on pipe, coatings, valves and heat exchanger.
- Utilized non-destructive testing and examination techniques (magnetic particle, radiography, ultrasonics, liquid penetrant and visual).

Metallurgical Technologist

- Performed routine 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.
- Utilized non-destructive testing and examination techniques (magnetic particle, radiography, ultrasonics and liquid penetrant).

HARDY ASSOCIATES

Summer 1982

Junior NDT Technician

- Inspection of pipelines, pressure vessels and drilling rigs.
- Utilized non-destructive testing and examination techniques (magnetic particle, radiography, ultrasonics and liquid penetrant).

QUALIFICATIONS & PROFESSIONAL MEMBERSHIPS

American Society for Metals (ASM) – Member

American Welding Society (AWS) – Member

Association of Professional Engineers, Geologists & Geophysicists of Alberta (APEGGA) – 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

Fire Investigation Association of Alberta - Member

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

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

6th 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, Slings & 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

May 2011