

Michael Moles
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EDUCATION:

B.A.	Metallurgy	Cambridge University, 1969
Ph.D.	Physical metallurgy	Cambridge University, 1972
M.B.A.	Marketing (Int. Bus.)	McMaster University, 1984
P.Eng.	Member	PEO
Ind. Ultrasonics	Level II	Canadian General Standards Board

EMPLOYMENT HISTORY:

Olympus NDT (formerly R/D Tech), July 1997 to present:

Market Development for upscale manufacturer of ultrasonic and electromagnetic nondestructive testing equipment. Specific responsibilities:

- Project leader for promotion and marketing of pipeline phased array inspection equipment, including
 - sales visits,
 - conference papers,
 - newsletters,
 - meetings, technical consultancies,
 - equipment demonstrations,
 - conference exhibitions.
- Extensive global travel to develop PipeWIZARD as “global standard”.
- Development of petrochemical NDT applications for pigging, SCC and others.
- Development of new technologies and techniques for pressure vessel construction inspection. Global promotion of PV inspection systems.
- Project lead on major USAF program to detect cracking around fasteners. Successful multi-year, multi-million program to develop large phased array system with preliminary intelligence and simple interface. Now being accepted as USAF standard, with major in-going developments.
- Friction stir weld inspection development with ultrasonic and eddy current arrays.
- Editing of books on phased arrays, including Guideline on Phased Array Technology and AUT Handbook.
- Current member of ASME Ultrasonics Working Group, pushing codes and code cases on TOFD and phased arrays.
- Preparation of brochures and marketing documents.
- Presentation of seminars on phased array applications.
- Technical controller of Olympus NDT Training Academy course content and schedules.

Moles Consulting, Nov 1996 to June 1997:

Developing techniques and inspection procedures for the oil & gas and nuclear industries.

Ontario Hydro Research Division/Technologies, Sept 1977 to November 1996:

NDE Section Variety of positions from research scientist to acting Section Head. Worked on many projects in:

- CANDU pressure tubes (accurate defect sizing, hydride concentration measurement, high temperature inspections ...);
- steam generators (development of TRUSTIE system and accurate depth sizing); and
- feeder pipes.
- Also wrote and developed procedures and techniques for inspecting pressure vessels and other components like turbines.
- Wrote many papers, reports.
- Chaired COG WP#34 on NDE of pressure tubes.
- One year rotation to Nuclear Operations.
- Initially employed in Thermal Plant Unit for creep testing.

Anglo-American mining co, Zambia, Sept 1972-April 1974

PROFESSIONAL MEMBERSHIPS:

American Society for NonDestructive Testing (ASNT)
Canadian Society for NonDestructive Testing (CINDE)
American Society of Mechanical Engineers (ASME)
American Welding Society (AWS)

JOURNAL PUBLICATIONS (May 2003 to present):

1. Honarvar, F., Sheikhzadeh, H., Moles, M., and Sinclair, A.N. (2004), "Improving the Time-Resolution and Signal-to-Noise ratio of Ultrasonic NDE Signals", *Ultrasonics*, **41**, 755-763.
2. Michael Moles and Jinchi Zhang, "Construction weld inspection procedures using ultrasonic phased arrays", *Materials Evaluation*, January 2005, p. 27.
3. Michael Moles, "A New Solution for Ultrasonic Weld Inspection", *Inspection Trends*, January 2005, **8**, No. 1, p. 27.
4. Jesse Granillo and Michael Moles, "Portable Phased Array Applications", *Materials Evaluation*, April 2005, p. 394.
5. Michael Moles, Noël Dubé, Simon Labbé and Ed Ginzel, "Review of Ultrasonic Phased Arrays for Pressure Vessel and Pipeline Weld Inspections", *ASME Journal of Pressure Vessel Technology*, August 2005, **127**, p. 351.

**CONFERENCES, TECHNICAL REPORTS, AND INVITED PRESENTATIONS
(May 2003 to present):**

1. Jinchu Zhang, Simon Labbé and Michael Moles, "Improved Lateral Focusing for Thin-walled Gas Pipelines Girth Welds using Phased Arrays", ASNT Fall Conference, Oct 17-21, 2005, Columbus, Ohio.
2. Robert K. Ginzel, Edward A. Ginzel, Mark Davis, Simon Labbé, & Michael Moles "Qualification of Portable Phased Arrays to ASME Section V", ASNT Fall Conference, Oct 17-21, 2005, Columbus, Ohio.
3. Michael Moles, "TOFD and Phased Arrays: Where they score, where they don't", ASNT Fall Conference, Oct 17-21, 2005, Columbus, Ohio.
4. Michael Moles, Fabio Fraga Moreira and Simon Labbé, "Special Phased Array Applications For Pipeline Girth Weld Inspections", Rio Pipeline Conference & Exposition 2005, Paper IBP1052_05, Rio de Janeiro, Brazil, October 17-21, 2005.
5. Michael Moles, Noël Dubé and Simon Labbé, "Special Phased Array Applications for Pipeline Girth Weld Inspections", 8th International Pipeline Symposium, Mérida, Mexico, Nov 9-11, 2005.
6. Chris Magruder (written and presented by Michael Moles), "Mechanized Inspection of Gas Pipeline SCC using Phased Arrays", Electric Power Research Institute Phased Array and Bolting Seminar, Miami Beach, Dec 6-8, 2005.
7. Sinclair, A.N., Fortin, J., Honarvar, F., Jastrzebski, M., and Moles, M.D.C., "Enhancement of Ultrasonic B-Scan Images for Sizing of Defects by Time-of-Flight Diffraction", TICME 2005, Tehran (2005).
8. Michael Moles, "Qualification of Phased Arrays to ASME Section V and Other Codes", International Pressure Equipment Integrity Association, Banff, Alberta, 1-3 February 2006.
9. Michael Moles and Simon Labbé, "Linear Inspection of Welds Using Ultrasonic Phased Arrays", ASM Trends in Welding Conference, Callaway Gardens, Georgia, May 16-20. (Not published).
10. André Lamarre, Olivier Dupuis and Michael Moles, "Complete Inspection of Friction Stir Welds in Aluminum using Ultrasonic and Eddy Current Arrays", ASM Trends in Welding Conference, Callaway Gardens, Georgia, May 16-20.
11. Michael Moles, Simon Labbé and Jinchu Zhang, "Improved Focusing for Pipeline Girth Weld Inspections using Phased Arrays", IICPIT Houston, June 1-4, 2005.
12. Fabio Fraga Moreira and Michael Moles, "Small diameter pipe girth weld inspections using ultrasonic phased arrays", IICPIT Houston, June 1-4, 2005.
13. Michael Moles, "Applications of Portable Phased Arrays", VIth NDT Conference, Mexico City, August 25-26.
14. Michael Moles and Simon Labbé, "Ultrasonic inspection of pressure vessel construction welds using phased arrays", National Pressure Equipment Conference, Banff, AB, Feb 9-11.
15. Michael Moles, "Application of Time-Of-Flight Diffraction for Weld Inspections", NonDestructive Testing Managers' Association, 14-16 February 2005, Las Vegas, NV.

16. Jesse Granillo and Michael Moles, "Portable Phased Array Applications", ASNT Spring Conference, Albuquerque, NM, March 14-18
17. Fabio Fraga Moreira and Michael Moles, "Small diameter pipe girth weld inspections using ultrasonic phased arrays", ASNT Spring Conference, Albuquerque, NM, March 14-18.
18. Andre Lamarre and Michael Moles, "Nondestructive Testing of Airplane Components", CASI (Canadian Aeronautics Symposium), Toronto, April 25-27, 2005.
19. Michael Moles, Olivier Dupuis, André Lamarre, Pamela Herzog, Mike Ashbaugh and John Selman, "FastFOCUS™ Phased Array System for Air Plane Fastener Inspections", XXII CONAEND National Conference for Non-Destructive Testing, 12-14 July 2004, organized by ABENDE.
20. Fabio Moreira, Michael Moles, Noël Dubé, Simon Labbé and Ed Ginzel, "Pipeline girth weld inspections of pipes from 60 mm diameter and 5 mm wall and above using ultrasonic phased arrays", XXII CONAEND National Conference for Non-Destructive Testing, 12-14 July 2004, organized by ABENDE.
21. Michael Moles, Noël Dubé, Simon Labbé and Ed Ginzel, "Pipeline Girth Weld Inspections using Ultrasonic Phased Arrays", XXII CONAEND National Conference for Non-Destructive Testing, 12-14 July 2004, organized by ABENDE.
22. Michael Moles and Jinchi Zhang, "Construction weld inspection procedures using ultrasonic phased arrays", ASNT Fall Conference, Las Vegas, NV, 15-19 November, 2004
23. Michael Moles, Noël Dubé and Simon Labbé, "Special Phased Array Applications for Pipeline Girth Weld Inspections", IPC04-0417, International Pipeline Conference 2004, Calgary, Alberta, 4-8 October 2004.
24. Michael Moles, Dave Stewart, Malcolm Gray, Henri Godinot, Henri Romazzotti, "Inspecting Seamless Pipe Welds of Variable Wall Thickness using Ultrasonic Phased Arrays", 4th Pipeline Technology Conference, Ostend, Belgium, 9-13 May 2004.
25. Michael Moles and Simon Labbé, "Automated Ultrasonic Inspection of Pressure Vessel Welds", ASME pressure Vessel and Piping Conference, La Jolla, CA, July 26-28, 2004.
26. Michael Moles, "Defect Sizing in Pipeline Welds – What Can We Really Achieve?", PVP2004-2811, ASME pressure Vessel and Piping Conference, La Jolla, CA, July 26-28, 2004.
27. Michael Moles, Olivier Dupuis, André Lamarre, Pamela Herzog, Mike Ashbaugh and John Selman, "FastFOCUS™ Phased Array System for Air Plane Fastener Inspections", 16th WCNDT (World Conference on NonDestructive Testing), Montreal, August 30-Sept 3, 2004.
28. Jastrzebski, M., Dusatko, T., Fortin, J., Farzbod, F., Sinclair, A.N., and Moles, M.D.C., "Enhancement of Synthetic Aperture Focusing Technique by Advanced Signal Processing", 16th World Conference on Nondestructive Testing, Montreal, (August 2004).
29. Michael Moles and Simon Labbé, "Automated Ultrasonic Inspection of Pressure Vessel Welds", 16th WCNDT, Montreal, August 30-Sept 3, 2004.

30. André Lamarre, Olivier Dupuis and Michael Moles, "Complete Inspection of Friction Stir Welds in Aluminum using Ultrasonic and Eddy Current Arrays", 16th WCNDT, Montreal, August 30-Sept 3, 2004.
31. Michael Moles, Noël Dubé and Ed Ginzel, "Pipeline Girth Weld Inspections using Ultrasonic Phased Arrays", 16th WCNDT, Montreal, August 30-Sept 3, 2004.
32. Michael Moles, Olivier Dupuis, André Lamarre, Pamela Herzog, Mike Bode and John Selman, "FastFOCUS™ Phased Array System for Air Plane Fastener Inspections", ASIP (Aircraft Structural Integrity Program) Nov 29-Dec 2, 2004.
33. Pamela Herzog, John Selman and Michael Moles, "Phased Arrays FastFOCUS System", International Conference on Aircraft Fatigue, May 2003, Switzerland.
34. F. Honarvar, T. Dusatko, Y. Fan, F. Farzbod, M. Moles and A.N. Sinclair, "A novel signal processing technique for enhancement of time-of-flight diffraction (TOFD) signals", International Chemical and Petroleum Industry Inspection Technology ICPIIT VIII, Houston, 18-21 June 2003.
35. Michael Moles and Frédéric Jacques, "Orbital Scanner for Tube-to-Tube Weld Inspections", International Chemical and Petroleum Industry Inspection Technology ICPIIT VIII, Houston, 18-21 June 2003.
36. Michael Moles and André Lamarre, "Phased Array Ultrasonic Inspection of Friction Stir Welds", 4th Friction Stir Weld Conference, Park City, Utah, June 2003.
37. Michael Moles, Noël Dubé and Frédéric Jacques, "Pressure Vessel Inspections Using Ultrasonic Phased Arrays", ASME 2003 Pressure Vessel and Piping Conference, Cleveland, 20-24 July 2003.
38. Michael Moles, Noël Dubé and Ed Ginzel, "PipeWIZARD – Pipeline Girth Weld Inspections using Ultrasonic Phased Arrays", ASME 2003 Pressure Vessel and Piping Conference, Cleveland, 20-24 July 2003.
39. Michael Moles, Noël Dubé and Ed Ginzel, "Pipeline Girth Weld Inspections using Ultrasonic Phased Arrays", 2nd International Conf on NDT, Istanbul, Turkey, 9-11 October, 2003.
40. Michael Moles, Noël Dubé and Frédéric Jacques, "Pressure Vessel Inspections Using Ultrasonic Phased Arrays", 2nd International Conf on NDT, Istanbul, Turkey, 9-11 October, 2003.
41. John Selman, Ted Miller, Olivier Dupuis, André Cyr, Michael Moles and Pamela Herzog, "FastFOCUS™ Ultrasonic Phased Array System for Airplane Fastener Hole Inspections", 2nd International Conf on NDT, Istanbul, Turkey, 9-11 October, 2003.
42. Michael Moles, Noël Dubé and Ed Ginzel, "Pipeline Girth Weld Inspections using Ultrasonic Phased Arrays", 7th Int Pipeline Congress and Exhibition, Puebla, Mexico, 12-14 Nov 2003, ref # CIN-039.
43. André Lamarre, Olivier Dupuis and Michael Moles, "Comprehensive Inspection of Friction Stir Welds using Arrays", ASM-ASNT Joint Conference, Fall 2003, Pittsburgh, 13-15 October 2003.
44. Michael Moles, Noël Dubé and Frédéric Jacques, "Ultrasonic Phased Arrays for Thick Section Weld Inspections", ASM-ASNT Joint Conference, Fall 2003, Pittsburgh, 13-15 October 2003.

45. Michael Moles, "Applications of Industrial Phased Arrays", 2nd American Welding Society Conference on NDT, Dec 2-3, 2003, Orlando, Florida.
46. Michael Moles, Dave Stewart, Malcolm Gray, Henri Godinot and Henri Romazzotti, "Inspecting Seamless Pipe Welds of Variable Wall Thickness using Ultrasonic Phased Arrays", American Society for Nondestructive Testing, 8-12 March 2004, Austin, Texas.
47. Michael Moles and Simon Labbé, "Developments in Ultrasonic Phased Array Inspections of Pipeline Welds", Inspection Trends, AWS, Spring 2004, vol 7, no 2.
48. Michael Moles and Ed Ginzel, "Ultrasonic Weld Inspection for the 21st Century-Phased Arrays", Inspection Trends, AWS, Spring 2004, vol 7, no 2.
49. Michael Moles and Simon Labbé, "Automated Ultrasonic Inspection of Pressure Vessel Welds", XXII CONAEND National Conference for Non-Destructive Testing, 12-14 July 2004, organized by ABENDE.
50. Michael Moles and Fabio Fraga Moreira, "Small Pipe Weld Inspections using Phased Arrays", XXII CONAEND National Conference for Non-Destructive Testing, 12-14 July 2004, organized by ABENDE.
51. André Lamarre, Olivier Dupuis and Michael Moles, "Complete Inspection of Friction Stir Welds in Aluminum using Ultrasonic and Eddy Current Arrays", XXII CONAEND National Conference for Non-Destructive Testing, 12-14 July 2004, organized by ABENDE.

Books Edited:

1. Japanese Tip Echo Handbook, First Edition, by Prof. Harumi, 1989.
2. Introduction to Phased Array Technology Applications, by R/D Tech, 2004.
3. Automated Ultrasonic Testing for Pipeline Girth Welds, by Ed Ginzel, February 2006.