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Senior Vice President Global Services Operations
Senior Technical Consultant

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SUMMARY

- A recognized expert and leader in the field of industrial machinery reliability management
- A proven technical educator and consultant – leading the development of Noria’s consulting programs and methodologies
- Developer of Effective Plant Reliability Management, a course designed to provide managers a sufficient understanding of the field with which to build effective strategies and tactics
- Co-developer of Noria’s technical Machinery Lubrication and Oil Analysis education courses.
- Active in numerous professional organizations, including standards organizations, holding directorship and other leadership positions
- Developed and manage Noria’s corporate consulting business
- Widely published, authoring or coauthoring more than 100 articles, technical papers, books and chapters
- A member of Noria Corporation’s senior management team, with strategic and P&L responsibility over its education programs and technical services division, including management of its global team of Senior Technical Consultants
- Senior Editor of Noria Publishing, overseeing technical editorial functions
- Executive responsibility over Noria’s overseas subsidiaries

FIELDS OF SPECIALIZATION

- Plant Reliability Management
- Maintenance Management
- Lube Contamination Control
- Lubrication Management
- Root Cause Analysis

- Reliability Engineering
- Predictive Maintenance
- Wear Debris Analysis
- Maintenance Procedures
- Maintenance Training

- Condition-Based Maintenance
- Machinery Lubrication
- Oil Analysis
- RCM
- Engineering Economics

EMPLOYMENT HISTORY

Noria Corporation, Tulsa, OK, (1998-present) - Co-founder, Senior Vice President in charge of Noria's Global Services, Senior Editor of Noria Publishing and member of the executive team that oversees Noria's global interests. Noria is a vendor-neutral organization. Below is a summary of Noria's subsidiary and associated operations.

Noria Reliability Solutions, Noria Reliability Solutions (NRS) is the global leader in education and technical consulting and in the fields of plant reliability management, machinery lubrication, contamination control, and oil analysis for machine condition monitoring. Within the fields of machinery lubrication, contamination control and oil analysis, NRS presents regularly scheduled public seminars, teaches customized on-site seminars, performs program audits, provides program design consulting and conducts failure investigations. Troyer trains and consults in the area of effective plant reliability management.

Noria Publishing, Noria's publishing activities include three, bimonthly printed periodicals: *ReliablePlant*, *Practicing Oil Analysis*, *Machinery Lubrication*, and several e-newsletters, including *Reliability Case Studies*, *Lube-Tips* and *Filtration Tips*, as well as books and other materials related to oil analysis, machinery lubrication and machine reliability.

Noria Latin America , S.A. , Based in Monterrey , Mexico , this majority owned subsidiary company provides Noria training, consulting services and publishing in Mexico and throughout Latin America . This office also provides collateral support to other Spanish-speaking entities around the world.

Noria Sub Sahara - Based in South Africa , this majority owned subsidiary company provides Noria training, consulting services and publishing in Mexico and throughout Southern Africa .

Noria Brasil (pending) – Based in Sao Paulo, Brazil, this majority owned subsidiary company provides Noria training, consulting services and publishing in Brazil and other Portuguese speaking countries.

Noria DACH (pending) – Based in Munich, Germany, this majority owned subsidiary company provides Noria training, consulting services and publishing in Germany, Austria and German speaking Switzerland.

Nippon Noria (pending) – Based in Tokyo, Japan, this majority owned subsidiary company provides Noria training, consulting services and publishing in Japan.

Noria Franchise Organization – Noria’s reach spans the globe through its network of branded franchise activities working through local partners.

For more details about Noria Corporation and its business activities, visit www.noria.com.

Entek/Rockwell Automation, (1997-1998) Milford , OH . Product Manager, Oil Analysis Systems. Acquired from Diagnostics, Inc., the Oil Analysis Systems division of Entek developed and marketed oil analysis instruments, software and services. Entek, a major supplier of machine condition monitoring systems and software, was later acquired by Rockwell Automation. Responsible for transitioning all aspects of the former Diagnostics business and product line to Entek, including engineering, R&D, strategic product development, software integration, marketing, staff training, technical services, customer service and P&L management.

Diagnostics, Inc., Tulsa , OK (1991 to 1997), Director of Technical Applications. Diagnostics developed and marketed oil analysis instruments, software and services, and multi-pass filter performance test stands. The market research firm of Frost & Sullivan called Diagnostics the “industry leader in world-wide in oil analysis equipment for predictive maintenance.” The company was sold to the Entek division of Rockwell automation in 1997. Highlights include:

- Began as an Applications Engineer in the Eastern USA and rose to the senior position of Director of Technical Applications worldwide.
- Was instrumental in positioning Diagnostics as the worldwide leader in oil analysis for machine condition monitoring.
- Developed and deployed strategies to effectively employ the company’s technologies and services in the field.
- Involved in all facets of the business, including product development, training and consulting.

Oklahoma State University , Stillwater , OK (1989-1991). As a graduate student, served as an instructor and research assistant. As an instructor, had full charge of several undergraduate classes, including upper division classes. Oversaw a regional competition sponsored by IBM Corporation in which OSU placed second. A special university-based research project led to career employment with the Diagnostics Corporation, and into the oil analysis and machine lubrication industry. Nominated for the Burlington Northern Teaching Excellence Award Spring, 1991.

CONSULTANCY

(Select List of Clients and Activities)

Routinely provides consulting services to clients worldwide. Consulting activities include general lubrication and oil analysis, training program development, troubleshooting and failure root cause analysis, financial justification for program deployment, lubricant supplier selection, audit for best practices, product and instrument development and marketing, etc. Below is a select client list.

Cargill Corporation	Goodyear Tire & Rubber	Southern Companies
Entergy	Hormel Corporation	Dupont Corporation
Citgo Petroleum	Exxon Corporation	Exxon Mobil Plastics
Northstar Steel	EPRl	USS Posco Steel
International Paper	John Deere Corporation	Ontario Power Generation

TRAINING AND SEMINARS

Public Education Courses. Have educated thousands of people on machinery lubrication, oil analysis, reliability engineering and contamination control at public venues. Courses have varied from basic to highly advanced, lasting from one to five days (and more). Course delivered in North America , Europe , Central and South America , Asia Australia and Africa . Co-developer of all Noria training materials.

Private Courses. Have delivered private seminars (half-day to five days in length) to more than 100 companies, including Southern Companies, Goodyear Tire & Rubber, Cargill Corp., International Paper, Champion Paper, Reliant Energy (formerly Houston Lighting & Power), Temple-Inland, Peabody Coal, Detroit Edison, Champion Paper, TXU, Weldwood International, Conoco, American Electric Power, Duke Power, Westinghouse Savannah River Site, Northstar Steel, ARCO, John Deere and many others.

PROFESSIONAL ACTIVITY

International Council for Machinery Lubrication (ICML), Director on the Board (volunteer position). The ICML is a non-profit professional organization committed to serving the needs of the machinery lubrication community. It serves as ANSI (American National Standards Institute) TAG (Technical Advisory Group) member to ISO (International Standards Organization), and is involved in international standards development, professional certifications in lubrication and oil analysis, curriculum development, annual achievement awards and scholarship. Visit www.lubecouncil.org for more information.

International Organization of Standardization (ISO) , Serve on behalf of ICML and ANSI (American National Standards Institute) on the US delegation for ISO TC108/SC5 in the development of machinery condition monitoring standards. Active member of working groups number five and eight. Currently lead the project to develop standards for equipment maintenance and condition monitoring optimization. Visit www.iso.org for more information.

Society for Maintenance and Reliability Professionals (SMRP) . Executive member, Chairperson of the SMRP Standards Committee and member of the Certification Committee for SMRP's Certifying Organization (SMRPCO), which grants qualified candidates the Certified Maintenance and Reliability Professional (CMRP) registration. SMRP is an independent, non-profit society organized by and for practitioners in the maintenance & reliability profession. Visit www.smrp.org

for more information.

Society of Tribologists and Lubrication Engineers (STLE), Individual Member. Active in the condition monitoring committee. Regularly present on oil analysis at STLE-sponsored condition monitoring workshops. Visit www.stle.org for more information.

American Society for Quality (ASQ), Senior Member. Visit www.asq.org for more information.

Society of Reliability Engineers (SRE), Member. Visit www.sre.org for more information

REGULAR EDITORIAL COLUMNS

Exponent. Published bimonthly in *ReliablePlant* magazine. Distribution is 50,000. Previous editorial topics include:

- *Reliability-Centered Sales? (Mar/Apr 2006)*
- *Expecting Reliability But Rewarding Failure (Jan/Feb 2006)*
- *Crisis, Not Aspiration, Drives Us to Action (Nov/Dec 2005)*
- *Certification for the Reliability Engineer (Sep/Oct 2005)*
- *Reliability. It Ain't All About Maintenance (Jul/Aug 2005 inaugural issue)*

Viewpoint, Published bimonthly in *Machinery Lubrication* magazine. Distribution is 35,000. Previous editorial topics include:

- *Viewpoint Gaining a New Perspective (Final Contribution)*
- *2008 – A Staff Oddity*
- *Certification Paves Your Way to Success*
- *Is Outsourced Machinery Lubrication for You?*
- *The Company Behind the Magazine*
- *A Silver Bullet for Machinery Lubrication*
- *Centralize or Decentralize Lubrication*
- *Selling Lubrication Excellence up the Food Chain*
- *Expand Your Lube Training Horizons*
- *Who's in Charge, You or Your Metrics?*
- *SMRP Certification is a Must for the Community*
- *Charge Your Lubrication Culture, Not Your Oil*
- *Greasing the Way to Solid Wall Street Performance*
- *Greasing Bearings: It's a Whole New Ball Game*
- *The Pathway to Lubrication Excellence: Creating a Cultural Transformation*
- *Optimizing Lube PMs*
- *Ole! Rallying for a New Lubrication Performance Metric*
- *Just the Facts, Sir*
- *Sustaining Lubrication Excellence*
- *Boiling Pot Surveillance*
- *Everyone Needs a Playbook of Lube Procedures*
- *How Rewarding is Your Lubrication Program*

- *Benchmarking Lubrication in the Power Generation Industry*
- *Does Your Lubrication Program Embarrass You? (inaugural issue)*

MRO Coach: Lubrication, Published bimonthly in *MRO Today* magazine – distribution is approximately 120,000 bimonthly. This column received an American Society of Business Publication Editors (ASBPE) award for editorial excellence in 2002. Previous editorial topics include:

- *Inspecting Oil-Lubed Motors (Dec 2004/Jan 2005) – (final contribution)*
- *Bearings, Motors and Grease (Oct/Nov 2004)*
- *Developing Specification (Aug/Sep 2004)*
- *Smart Selection, Purchase (Jun/Jul 2004)*
- *Selecting the Right Supplier (Feb/Mar 2004)*
- *Two Words, Big Differenced (Dec 2003/Jan 2004)*
- *Joe split. What do we do? (Oct/Nov 2003)*
- *Look into hands-free lubing (Aug/Sep 2003)*
- *Lubricant, filter hold clues (Jun/Jul 2003)*
- *Who's lubing your machines? (Feb/Mar 2003)*
- *Motivate, educate and think! (Dec/Jan 2002/2003)*
- *Humanware, a critical factor (Aug/Sep 2002)*
- *Don't shoot the messenger ((Jun/Jul 2002)*
- *The cost of proper lubrication (Apr/May 2002)*
- *This is your wake-up call (Feb/Mar 2002) – (inaugural contribution)*

PUBLISHED BOOKS, MANUALS AND CHAPTERS

Troyer, D. (2004) "Lubricating Industrial Electric Motors," in the forthcoming CRC Tribology and Lubrication Engineering Handbook , G. Totten, Editor (expected printing fall 2005).

Troyer, D. (2003) "An Introduction to Lubricant Contamination Control and Oil Analysis for Machine Condition Monitoring," Chapter in the forthcoming book Maintenance Engineering, McGraw Hill, New York.

Fitch, J. and D. Troyer, Editors, (2001/2002) Proceedings of the Practicing Oil Analysis 2001/2002 International Conference and Exhibition, Scheduled for September 19-21, 2001, postponed to March 19-21, 2002 due to the events on September 11, 2001 .

Fitch, J. and D. Troyer (2000) The Lubrication Field Testing and Inspection Guide, Noria Publishing, Tulsa , OK .

Trujillo , G, J. Fitch and D. Troyer (2000 – 2005 Revisions) Machinery Lubrication Coursebook (Levels I & II), Noria Publishing, Tulsa , Oklahoma .

Fitch, J., D. Troyer and M. Barnes (1998 – 2005 Revisions) Oil Analysis Coursebook (Levels I &

II), Noria Publishing, Tulsa , OK .

Troyer, D and J. Fitch (2000) Oil Analysis Basics, Noria Publishing, Tulsa , OK : USA .

Fitch, J. and D. Troyer (1998 – 2001) Electronic Lubrication Manual, Noria Publishing, Tulsa , Oklahoma . Development is ongoing.

Fitch, J. and D. Troyer, Editors, (2000) Proceedings of the Practicing Oil Analysis 2000 International Conference and Exhibition, Tulsa , Oklahoma , USA , October 24-26, 2000 .

Troyer, D. (2000) “Advanced Strategies for the Monitoring and Control of Water Contamination in Oil Hydraulic Fluids,” in Hydraulic Failure Analysis: Fluids, Components and System Effects, Totten, G., D. Wills and D. Feldman (editors), ASTM STP 1339, ASTM , West Conshohocken, PA.

Fitch, J. and D. Troyer, Editors, (1999) Proceedings of the Practicing Oil Analysis ‘99 International Conference and Exhibition, Tulsa, Oklahoma, USA, October 26-27, 1999.

Articles and Technical Papers Published in Periodicals

Troyer, D. and M. Barnes (2005) “Executing Procedure-Based Maintenance.” SMRP Solutions, Issue 4.

Troyer, D. and S. Gebarin (2005) “Slick Asset Care.” Plant Services Magazine, February.

Troyer, D. and J. Fitch (2005) “Lubrication Training in the Reliability Era,” Compundings Magazine, February.

Fitch, J. and D. Troyer (2004) “The Basics of Used Oil Sampling,” Practicing Oil Analysis Magazine, September.

Troyer, D. (2004) “Looking Forward to Lubricant Oxidation,” Practicing Oil Analysis Magazine, March.

Troyer, D. (2004) “Playbook plus – Maintenance Benefits from oil and lubrication procedures,” Plant Engineering and Maintenance, April

Troyer, D (2004) "Establishing Moisture Contamination Targets for Hydraulic Systems," Machinery Lubrication Magazine, January.

Troyer, D. (2003) “Lubrication: Off-Highway Equipment Needs Lubrication Procedure Playbook,” The Asphalt Contractor, April.

- Troyer, D. (2003) "Sequence Your Tests for Success," Practicing Oil Analysis, Jan/Feb.
- Troyer, D. (2002) "Getting to the Root of Poor Lubrication: Root Cause Analysis Techniques for the Lubrication Professional," Practicing Oil Analysis, Nov/Dec.
- Troyer, D. (2002) "Align Your OA Program with Modern Equipment Strategies". Practicing Oil Analysis Magazine. September.
- Troyer, D. (2002) "Regular Inspection of Critical Lubrication Parameters," Practicing Oil Analysis, May/June.
- Troyer, D. (2002) "Understanding Absolute and Kinematic Viscosity," Practicing Oil Analysis, Mar/Apr.
- Troyer, D. and M. Barnes (2002) "Goodbye Oiler, Hello Skilled Lube Tech and Lube Analyst," Practicing Oil Analysis, Jan/Feb.
- Troyer, D. (2002) Estimating Values in the Absence of Real Data: Deploying the Delphi Method," Practicing Oil Analysis, Jan/Feb.
- Troyer, D. and M. Barnes (2002) "Statistically Derived Rate-of-Change Oil Analysis Limits and Alarms," Practicing Oil Analysis, Jan/Feb.
- Troyer, D. (2001) "The Buck Stops Here," Maintenance Journal (Australia), July.
- Troyer, D. and J. Kucera (2001) "Lubricant Storage Life Limits – Industry Needs a Standard," Machinery Lubrication, May/June.
- Troyer, D. (2001) "Removing Water Contamination," Machinery Lubrication, May/June.
- Troyer, D. and F. Ward (2001) The Nose Knows, Using Odor as a Test for Your Oils," Practicing Oil Analysis, May/June.
- Troyer, D. (2001) "Is Onsite Oil Analysis Right for Your Organization," Practicing Oil Analysis, March/April.
- Troyer, D. (2001) "Level I Certification for the Machine Lubricant Analyst," Practicing Oil Analysis, January/February.
- Troyer, D. (2001) "Lets Integrate Oil Analysis and Vibration Analysis," The Manufacturer of Michigan , January.
- Troyer, D. and J. Fitch (2000) "Introducing the International Council for Machinery Lubrication,"

Practicing Oil Analysis, November/December.

Troyer, D. (2000) "How to Lube up Your FMEA Process," Practicing Oil Analysis, May/June.

Fitch, J. and D. Troyer (2000) "Sampling Methods for Used Oil Analysis," Lubrication Engineering, March.

Troyer, D. (2000) "The Buck Stops Here: How to Cost Justify Your Oil Analysis Program," Practicing Oil Analysis, January/February.

Troyer, D. (1999/200) "Analyze This: Detect Problems Before they Occur by Teaming Oil Analysis and Vibration Analysis, MRO Today Magazine, December/January.

Troyer, D. (1999) "Secondary Sampling Pinpoints Wear Problems," Practicing Oil Analysis, September/October.

Troyer, D. (1999) "Get Ready for More Soot: Is Your Soot Monitoring Program Up to the EPA's New Challenge?" Practicing Oil Analysis, July/August.

Troyer, D. (1999) "Simplify Trending Using Percentile Calculations," Practicing Oil Analysis, May/June.

Troyer, D. (1999) "Use Simple Correlation Analysis to Improve Confidence in Oil Analysis Data," Practicing Oil Analysis, March/April.

Troyer, D. (1999) "The Sequential Four Ball Test: Use it to Evaluate AW/EP Performance," Practicing Oil Analysis, March/April.

Troyer, D. (1999) "RCM and Oil Analysis: Reliability-Centered Maintenance and its Meaning to the Oil Analysis Professional," January/February.

Troyer, D. (1998) "The Visual Crackle: A New Twist to an Old Technique," Practicing Oil Analysis, September/October.

Troyer, D. (1998) "Let's Integrate Oil Analysis and Vibration Analysis," Practicing Oil Analysis, July/August.

Troyer, D. (1998) "Take Full Advantage of Oil Analysis," Maintenance Technology, July/August.

Troyer, D. (1998) "Effective Integration of Vibration Analysis and Oil Analysis," Maintenance Technology, November.

Troyer, D. (1996) "Lubricant Condition Monitoring: A Proactive, Reliability-Driven Approach,"

Maintenance Technology, November.

Troyer, D. (1996) "Lubricant Condition Monitoring: The Proactive Strategy of the Future," Plant Services, April.

Mayo, J. and D. Troyer (1995) Extending Hydraulic Component Life at Alumax of South Carolina ,” Reliability Magazine, January/February.

Troyer, D. and J. Fitch (1995) "An Introduction to Fluid Contamination Analysis," P/PM Technology, April.

Troyer, D. (1995) "Three Dimensions of Equipment Condition Monitoring with Oil Analysis," P/PM Technology, April.

Troyer, D. and L. Lazzeroni (1994) " For Quality's Sake, Maintain Hydraulic Machines," Quality Progress, October.

Troyer, D. and H. Borden (1994) "Streamlining Oil Analysis with Field Testing," P/PM Technology, April.

Articles and Technical Papers Published Conference Proceedings

Troyer, D. (2005) "Machinery Lubrication Excellence," Asset Management 2005, May 10-13, San Diego , CA .

Troyer, D. (2005) "Reliability Engineering Principles," Reliability World 2005, April 26-28, San Antonio TX .

Troyer, D. (2005) "Standards Initiative by the Society for Maintenance and Reliability Professionals," Reliability World 2005, April 26-28, San Antonio TX .

Nicholas, J. and D. Troyer(2005) "Procedure-Based Maintenance," Reliability World 2005, April 26-28, San Antonio TX .

Troyer, D. (2005) "Using Oil Analysis as a Root Cause Analysis Tool," Proceedings of the Lubrication Excellence 2005 Conference and Exhibition, April 26-28, San Antonio , TX .

Troyer, D. (2004) "Condition-Based Greasing: How Much, How Often," Proceedings of the Ultrasound World Conference and Exhibition, October, Clearwater , FL.

Troyer, D. (2004) "Advanced Grease Selection Strategies," Proceedings of the Lubrication Excellence 2004 Conference & Exhibition, May, Nashville , TN.

Troyer, D. (2004) "Condition-Based Greasing: How Much, How Often," Proceedings of the Lubrication Excellence 2004 Conference and Exhibition, May, Nashville , TN.

Troyer, D. (2004) "How to Sell Management on Your Lubrication Program," Proceedings of the Lubrication Excellence 2004 Conference & Exhibition, May, Nashville , TN.

Troyer, D. (2003) "Benchmarking Lubrication Best Practices," Proceedings of the International Maintenance Conference (IMC), Dec. 7-10, Clearwater , FL.

Troyer, D. (2003) "Using Oil Analysis as a Root Cause Analysis Tool." Proceedings from the Lubrication Excellence 2003 Conference and Exhibition, April 1-3, Houston , TX .

Troyer, D. (2003) "Decision Model and Wizard to Guide the Selection of a PAO Synthetic Oil in Industrial (Non-Crankcase) Applications." Proceedings from the Lubrication Excellence 2003 Conference and Exhibition, April 1-3, Houston , TX .

Troyer, D. (2003) "Review of Noria's Lubricant Benchmark Study." Proceedings from the Lubrication Excellence 2003 Conference and Exhibition, April 1-3, Houston , TX .

Mathew, J. and D. Troyer (2002) "Standardizing Condition Monitoring: Initiatives to Develop ISO Standards for Machine Condition Monitoring." Proceedings of the Annual Conference of the Society of Maintenance and Reliability Professionals, October 27-30, Nashville , TN.

Troyer, D. (2002) "Precision Lubrication for the Power Generation Industry," Proceedings of the Practicing Oil Analysis 2001/2002 International Conference and Exhibition, Tulsa, OK, March, 2002 (rescheduled from September 2001).

Troyer, D. (2002) "Scoping Lubrication and Oil Analysis Training for Managers, Technicians, Operators and Mechanics," Proceedings of the Practicing Oil Analysis 2001/2002 International Conference and Exhibition, Tulsa, OK, March, 2002 (rescheduled from September 2001).

Troyer, D. (2002) "How to Align Your Oil Analysis Program with Modern Equipment Maintenance Strategies," Proceedings of the Practicing Oil Analysis 2001/2002 International Conference and Exhibition, Tulsa, OK, March, 2002 (rescheduled from September 2001).

Troyer, D. (2001) "Demonstrating the Financial Benefits of Equipment Reliability Projects," Proceedings of the 10 th International Process & Power Plant Reliability Conference, Houston , Texas , November.

Troyer, D. and J. Fitch (2001) Skills Standards Development and Competency Assurance for Machinery Lubrication Technicians – New Initiatives by the International Council for Machinery Lubrication, Proceedings of the 2 nd World Tribology Congress, Vienna, Austria, September.

Troyer, D. and J. Fitch (2001) "Precision Lubrication for the Power Industry," Proceedings of the 2001 EPRI International

Maintenance Conference, Houston , TX , August.

Troyer, D. (2001) "Economic Modeling of Condition Monitoring Programs," Proceedings of the CM2001 Conference, San Antonio , TX , February.

Troyer, D. (2000) "Rationalizing the Benefits of Condition-Based Maintenance – An Oil Analysis Example," Proceedings of the Enteract 2000 Conference and Exposition, Houston , TX , May 14-17.

Troyer, D. (2000) "A Method for Rationalizing the Economic Benefits of Oil Analysis," Proceedings of the Joint Oil Analysis Program (JOAP) International Condition Monitoring Conference, Mobile , Alabama , April.

Fitch, J. and D. Troyer (1999) "Simplify Oil Analysis with Easy Tests and Inspections," Proceedings of the 1999 Practicing Oil Analysis International Conference and Exhibition, Tulsa, Oklahoma, October.

Troyer, D. (1999) A Tutorial on Financial Project Justification Methods for the Oil Analysis Professional," Proceedings of the 1999 Practicing Oil Analysis International Conference and Exhibition, Tulsa , Oklahoma , October.

Troyer, D. (1999) "What Does Reliability-Centered Maintenance Mean to the Oil Analysis Professional?" Proceedings of the Enteract '99 Conference and Exhibition, Orlando , FL , May, 2-5.

Troyer, D. (1998) "Effective Integration of Vibration Analysis and Oil Analysis," Proceedings of the Enteract '98 Conference and Exhibition, Cincinnati , OH , April, 19-22.

Troyer, D. (1997) "Implementing On-site Oil Analysis at a Power Plant," Proceedings of the University of Tennessee Maintenance and Reliability Conference, Knoxville , TN , May.

Troyer, D. (1996) "Improving Mechanical Reliability and Troubleshooting Effectiveness with Lubricant Condition Monitoring " Proceedings of the American Iron and Steel Engineers Annual Convention, Cleveland , September.

Troyer, D. (1996) "Lubricant Condition Monitoring: A Proactive, Reliability-Driven Approach," Proceedings of the International Maintenance Management Conference, Sydney/Melbourne, Australia , August.

Troyer, D. and T. Crum (1996) "Oil Analysis and Machine Condition Monitoring: A general Introduction and Workshop, Proceedings from the 20 th Annual Meeting of the Vibration Institute,

St. Louis, MO, June.

Troyer, D. and J. Fitch (1996) "An Introduction to Fluid Contamination Analysis," Proceedings of the Predictive Maintenance Technology National Conference, Indianapolis , IN , December.

Troyer, D. (1996) "Lubricant Contamination Control: Part Three," Proceedings of the Machinery Reliability Conference, Memphis , TN , April.

Troyer, D. (1996) "Lubricant Contamination Control: Part Two," Proceedings of the Machinery Reliability Conference, April, Memphis , TN.

Troyer, D. (1996) "Lubricant Contamination Control: Part One," Proceedings of the Machinery Reliability Conference, April, Memphis , TN.

Troyer D. (1995) "Developing and Implementing a Lubricant Condition Monitoring Program at a Power Generation Facility," Proceedings of the Predictive Maintenance Technology National Conference, Indianapolis , IN , December.

Troyer D. (1994) Absolute vs. Kinematic Viscosity: A Key Field-Level Monitoring Parameter," Proceedings of the Joint Oil Analyses Program (JOAP) International Conference on Machine Condition Monitoring, Pensacola , FL , December.

Troyer, D. and J. Fitch (1994) "An Introduction to Fluid Contamination Analysis," Proceedings of the Predictive Maintenance National Conference, Atlanta , Georgia , USA , November.

Troyer, D. (1994) "Three Dimensions of Equipment Condition Monitoring with Oil Analysis," Proceedings of the Predictive Maintenance National Conference, Atlanta , Georgia , USA , November.

Troyer, D. and H. Borden (1993) "Streamlining Oil Analysis with Field Testing" Proceedings of the Predictive Maintenance Technology National Conference, Dallas , Texas , USA , November.

Other/Miscellaneous Publications

Troyer, D. (1996) "Contamination Prevention Extends Equipment Life," Interview by the editor of Maintenance Management, Strategies for Achieving Excellence in Maintenance, September 25.

Troyer, D. (1992) "Toward ISO 9000: Achieving Roll-Off Cleanliness of OEM Machinery Hydraulics." Application Paper, Diagnostics, Inc.

Troyer, D. "Contamination Monitoring for Maximum Uptime,"
www.maintenancesresources.com/ReferenceLibrary/OilAnalysis/oa-cm.htm

Troyer, D. "Why Oil Analysis Should Be Done Onsite,"

www.maintenancesresources.com/ReferenceLibrary/OilAnalysis/oa-cm.htm

Troyer, D. "The Three Dimensions of Fluid Condition Management,"

www.maintenancesresources.com/ReferenceLibrary/OilAnalysis/oa-cm.htm

RECENT INVITED LECTURESHIPS

A popular speaker on the subjects of oil analysis, machinery lubrication, reliability engineering and maintenance optimization. Below is a select list of recent engagements (since 1999):

- Annual Conference of the Society for Maintenance & Reliability Professionals, St. Louis, MO, October, 2005
- Pulp & Paper Industry Reliability Conference, Atlanta, GA, October 2005
- Lean Manufacturing – Tools for Lean Maintenance, Columbus, OH, October, 2005
- Lean Manufacturing University IV, Las Vegas, CA, May, 2005
- Asset Management 2005, San Diego, CA, May, 2005
- Reliability World/Lubrication Excellence 2005, San Antonio, TX, April, 2005
- STLE Fort Worth, TX Chapter Meeting, March, 2005
- Ultrasound World, Clearwater, FL, October 2004
- NLGI Annual Meeting, Dana Point, CA, September 2004
- STLE Annual Meeting, Toronto, Ontario, May 2004.
- International Maintenance Conference (IMC), Clearwater, FL, December 2003.
- STLE Annual Meeting, New York, NY, May 2003
- Society of Maintenance and Reliability Professionals (SMRP) 2003 National Conference, taught managers workshop on lubrication excellence.
- Society of Maintenance and Reliability Professionals (SMRP) 2002 National Conference, Nashville, TN, October, 2002. Served as chairperson of the applied technology track and taught workshop.
- STLE Annual Meeting, Houston, TX, May 2002
- Practicing Oil Analysis 2002, Tulsa, OK, March 2002
- CM 2002 Conference, Dallas, TX, February 2002.
- Process and Power Plant Reliability Conference, Houston , TX , November 2001.
- World Tribology Congress, Vienna Austria , September 2001.
- EPRI International Maintenance Conference, Houston , TX , August 2001.
- STLE Annual Meeting 2001, Orlando , FL , 2001.
- CM 2001 Conference, San Antonio, TX, February 2001.
- Practicing Oil Analysis 2000, Tulsa , OK , October 2000.
- Joint Oil Analysis Program (JOAP) International Condition Monitoring Conference, Mobile , Alabama , April 2000.
- Society for Maintenance and Reliability Professionals (SMRP) 2000 National Conference, Cleveland , OH , October 2000.
- STLE Annual Meeting 2000, Nashville , TN , May 2000.
- Practicing Oil Analysis '99 Conference, Tulsa , OK , October 1999.
- Texas A&M 28 th Annual Turbomachinery Symposium, Houston , TX , September 1999.

PROFESSIONAL CREDENTIALS

Certified Reliability Engineer (CRE), ASQ # 04281 - October 1996.

Certified Maintenance and Reliability Professional (CMRP), SMRP # 01038 - October 2001.

PATENTS

Automated Lubrication Service and Maintenance Planning System (pending), US Patent Application 2004/0236706 A1, Nov 25, 2004 , James Chester Fitch and Drew David Troyer, Inventors.

EDUCATIONAL CREDENTIALS

Formal and continuing education includes study in machinery lubrication, oil analysis, machinery maintenance, reliability engineering, statistics and measurement theory business administration and technology management. Select highlights (in reverse chronological order) include:

University of Texas , Austin , TX - Engineering Program in Applied Reliability and Product Assurance, June 1995

Oklahoma State University , Stillwater , OK - Post-master's study and research, 1989-1991.

Oklahoma City University, Oklahoma City , OK - MBA with High Honors, December 1989.

University of Central Oklahoma , Edmond , OK – Bachelor's degree with Dean's Honors, May 1988.

PERSONAL

- Born December 22, 1962
- Married (Lorre Kay), two children (Kyle and Emily)
- Enjoy fly-fishing and other outdoor sports, golf and the culinary arts
- Member, Advisory Board of Directors, Land Legacy