

Curriculum Vitae

Dr. Scott W. Beckwith

January 2008

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Section I

CV for Dr. Scott W. Beckwith

January 2008

Dr. Scott W. Beckwith

BTG Composites Inc.

Swbeckwith@aol.com

CURRICULUM VITAE for DR. SCOTT W. BECKWITH
(January 2008)

Over 40 years experience in marketing, management, engineering, and manufacturing technical roles within the composite structures and propulsion industry. Expertise and skills developed in export control regulations, materials evaluation, and broad range of composite structures manufacturing processes, design and analysis methodology, non-destructive testing (NDI), testing and market research. Recognized as a key technical expert internationally with services on critical U.S. Government and industry committees, and professional society advisory boards, in areas of commercial and aerospace composites design and manufacturing technology.

PROFESSIONAL EXPERIENCE

BTG COMPOSITES, INC., President

Taylorville, Utah

October 2005 – Present

BTG COMPOSITES, LLC, Managing Member

Taylorville, Utah

January 1997 – October 2005

- Expert Witness, litigation and insurance support services
- Expert Witness in trade secret and process/design technology cases involving: solid rocket motor (SRM) fiber optic instrumentation technology (SRM industry), carbon fiber composite bicycle fork failure and treadmill platform failure (sports & recreation industry), vacuum bagged composite slot cell armor (power industry) and filament winding equipment (composites manufacturing industry)
- Primary consultant on large composite structure for oilfield technology application involving deep sea (1000-3000 meter depths) submergence of 1-2 meter diameter carbon fiber/epoxy compression-loaded structures
- Assessment of unique composite coiled tubing process for oilfield technology application
- Expert Witness for insurance litigation involving NASA X-33 Cryogenic Tank failure assessment of carbon/epoxy composites manufacturing, design, honeycomb core-to-composite failure assessment, autoclave and vacuum bagged process assessment with fiber placement technology, NDI and testing technology for insurance claims submitted by manufacturing contractor, Lockheed-Martin (Palmdale Skunk Works)
- Carbon fiber market, production and capacity survey for CF supplier customer interested in worldwide CF (PAN and Pitch base fibers) assessment

- Expert Witness for civil suit involving carbon fiber suppliers (8) as materials and manufacturing technology expert in price-fixing suit on behalf of materials suppliers (US, Japan and European suppliers)
- Consultant on composite manufacturing technology program for manufacturing vacuum-assisted resin infusion of 48-foot long-haul composite trailer (carbon/glass fiber with epoxy resin)
- Expert Witness for owner of carbon composite Beech/Raytheon Starship with corrosion problems in composite fuselage using lightning strike metal carbon fabric/epoxy prepreg materials
- Expert Witness for civil suit as composites manufacturing technology and design in case involving patent infringements on composites resin infusion manufacturing process for commercial aircraft, marine and advanced composites/FRP markets
- Market survey study for carbon and graphite fiber supplier interested in thermoplastic composites market applications for commercial and military aircraft structures, as well as definition of carbon/graphite supplier base worldwide

BECKWITH TECHNOLOGY GROUP, LLC, Managing Member Sept 1969 - Present

Taylorville, Utah

(Formerly **Beckwith Design & Analysis Group** prior to August 1990)

- Development of large diameter pressurized FRP pipe products (pipe and joint fittings) that are outside existing API Standards for Kazakhstan customer through design, testing and process development
- Key technical advisor to U.S. Departments of Commerce and State on the Materials Technical Advisory Committee (MTAC) for composites/FRP materials, manufacturing, testing and design technology (US and International) from 1989 to 2002 (**four Presidential appointments**)
- Established composite FRP production factory in Sharjah, United Arab Emirates with design, test verification and plant set-up for low-to-high pressure filament wound pipe, gravity sewer pipe and other pipe and fittings products made from epoxy, vinyl ester and polyester resin systems
- Designed and developed carbon/epoxy composite drill pipe sections with heat pipe system for controlling temperature and contained pressure of solidified methane hydrate core samples obtained at greater than 1000-foot drill levels (Japanese client)
- Consultant to Westinghouse Marine on drilling/production riser technology, oilfield environmental effects, and design technology for composites usage in oilfield industry
- Consultant to Texas A&M University/University of Texas-Austin OTRC for composites technology and market development to oilfield composites applications

- Developed series of 'hands-on' composite manufacturing courses in aerospace and commercial/FRP fields for management, engineering, and technician levels involving filament winding, fiber placement, vacuum bagging, autoclaving, pultrusion and other manufacturing technologies
- Designed, developed, and certified (UL-1316) underground petroleum storage tank (UST) system and waste water treatment storage tanks (2.5 to 3.5 m diameter structures) after establishing production line operation in Sungai Petani, Malaysia
- Established failure mode(s) and corrective action for major industry composite CNG tanks (Comdyne, GMC, EDO Canada), composite air engine start tank (Amalga/ Ingersoll-Rand), Delta II Launch Vehicle and AMROC carbon-fiber pressure vessel field failures
- Conducted market surveys for Pacific Rim customers in composite and FRP processes with CNG and LPG (NGV certification) applications and developed business strategy
- Designed and developed prototype filament wound composite LPG tank with thin metal liner for home cooking industry
- Solid propellant and casebond structural integrity, subscale design and instrumented motor consulting for number of industry and government agencies (Lockheed, Thiokol, US Navy, US Air Force, Aerojet, The Aerospace Corporation, US Department of Commerce, National Research Council, NASA, etc.)
- Designed and manufactured 'second generation' composite/FRP amusement ride with simultaneous combined rotational (360 deg), horizontal, vertical, and pitch motions for 16-person structure (currently @ NASA's Space Camp, Orlando, Florida)
- Member of advisory board for SAMPE/CALTRANS Seismic Retrofit & Rehabilitation (SRR) Program using composites technology for infrastructure applications
- Recognized industry expert in damage assessment in composite pressure vessels

SOCIETY FOR ADVANCEMENT OF MATERIAL & PROCESS ENGINEERING

(SAMPE), International Technical Director
Covina, California

July 1996 - Present

- International Technical Director for 4500 member professional society with key responsibilities over two technical journals (**SAMPE Journal** and **Journal of Advanced Materials**), technical conferences, and overall society technical guidance. (Interim Technical Director since 1 April 1998; Technical Director since 1 September 1998):
 - Technical Editor, **SAMPE Journal**, SAMPE's bi-monthly technical and membership journal publication

- Acting Editor for **Journal of Advanced Materials** (July-December 2005)
- Associate Editor for **Journal of Advanced Materials** (January 2006 to present)
- Editorial Reviewer for **Journal of Advanced Materials**, SAMPE's peer-reviewed academic and technical journal publication (1998-2005)
- Editorial Reviewer for **SAMPE Quarterly** journal (1991-1993)
- Technical Program Manager for SAMPE on Seismic Retrofit & Repair (SRR) Program for evaluating and developing composite standards for bridge column repair technology for wide range of carbon and glass fiber composite materials.
- International Vice President of SAMPE until accepting International Technical Director position on 1 September 1998.
- International Secretary of SAMPE from 1 July 1996 through 30 June 1998.
- Conducts advanced composites materials, structures, processing, testing, inspection/NDI and manufacturing tutorials for SAMPE conferences and exhibitions

AMERICAN COMPOSITE MANUFACTURERS ASSOCIATION (ACMA)

Formerly, COMPOSITES FABRICATION ASSOCIATION (CFA) June 1997 - Present
Arlington, Virginia

- Contributing Editor for ACMA's technical journal (previously **Composites Fabrication**; currently **Composites Manufacturing** or **CM**) with responsibility for producing several technical articles each year.
- Conducts tutorials and workshops for ACMA on FRP (fiber reinforced plastics) materials, processing, manufacturing and design technologies.

HERCULES INCORPORATED/HERCULES AEROSPACE CORPORATION

Magna, Utah **August 1974 - July 1992**

Manager, Composite Structures Technology (1989-1992)

- Responsible for actively marketing composite structures technology and assessing manufacturing processes for potential commercial market segments (infrastructure, energy, transportation, marine, chemical/corrosion, oilfield, battlefield and sporting goods/recreation)
- Established 70% lower cost manufacturing process for RTM composite aircraft wings using molded-in fittings and demonstrated first known RTM aerospace components
- Developed unique composite armor design resulting in 30% weight savings and complete success in initial field tests under actual fire conditions

- Manager of Air Force funded program (Damage Assessment of Composite Cases) to assess impact, surface cut, abrasion, and delamination damage to carbon-, glass-, and Kevlar-fiber composite pressure vessels – major U.S. effort to assess critical damage problem in carbon-fiber tanks and pressure vessels
- Provided design and manufacturing support for Carbon Fibers Marketing in various market segments pertaining to sports and recreation, commercial and industrial, transportation and aerospace markets. Pressure vessel support for compressed natural gas (CNG) and natural gas vehicles (NGV) industries.
- Developed 5-year market forecasts for strategic plan for composite structures and carbon fibers in missile technology and commercial, industrial, and sporting goods markets
- Key technical advisor to National Research Council for U.S. Congress on Competitiveness of U.S. Composite Manufacturing, Processes, and Technology (1992)

Manager, Materials Engineering Department (1984-1989)

- Managed over 40 engineers and support staff with \$5 million annual programs budget
- Provided design and manufacturing support for composite solid rocket motor cases ranging from 2.75-inch diameter up through 146-inch diameter segmented launch vehicles for space transportation systems and conventional rocket motor programs (Space Shuttle, Delta, Titan IV SRMU, Pegasus, Pershing II, Trident I and II, SICBM, Missile X or MX, AMRAAM, SRAM II, Polaris, Poseidon)
- Conducted failure investigations and provided technical support for all major fiber-reinforced composite cases (S-glass, Kevlar, Carbon, and hybrid fiber) manufactured and tested at Hercules Aerospace Corporation in static burst and/or flight tests
- Program Manager of Air Force, Navy, and NASA funded programs to assess composite pressure vessel structural integrity, damage tolerance, test and inspection methods, and accept-reject criteria – these 3 programs represented over 95% of funded work on damage from field handling and processing in composite pressure vessels and solid rocket motor cases in the U.S.
- Program Manager of Air Force Damage Assessment for Composite Cases (DACC) Program to evaluate damage tolerance, damage scenarios, materials, processing methods and testing/inspection for composites used in filament wound composite motor cases (1986-1990)
- Improved multi-facility efficiency by standardizing solid propulsion design and analysis methods, and, incorporated approach into composite structures areas
- Wrote critical propellant, casebond, composite case, nozzle, and inert structures technical and management sections for all successful Hercules propulsion proposals

Superintendent, Materials Characterization Group (1974-1983)

- Principal Investigator on Air Force Interim NEPE Propellant/Casebond Aging Program to evaluate high elongation advanced propellant materials and systems (1979-1980)
- Managed group of 12 engineers and technicians with responsibility for experimental testing and materials evaluation in variety of manufacturing processes using traditional and instrumented subscale technologies with sensor, NDI/NDE and analog test configurations
- Provided key support in design and manufacturing of large (74-inch through 146-inch) diameter solid rocket motor composite cases made from S-glass, Kevlar, carbon and hybrid fiber systems
- Developed innovative test methods and analysis techniques for evaluating elastomeric, plastic, adhesive, and composite material – realized over 50% cost reductions through standardized test methods and characterization

TEXAS A&M UNIVERSITY

College Station, Texas

September 1969 - July 1974

- Contracted research efforts on various advanced composites technology programs:
 - Thermal properties of solid propellant materials (ONR)
 - Non-linear, time-dependent properties of fiber-reinforced composites (ONR, AF)
 - Mechanical property characterization of solid propellant materials subjected to multiaxial loading conditions (ONR, AF)
 - Characterization of thin-film high altitude research balloon material failure (NOAA)
 - Characterization of fiber-reinforced composite materials used in filament wound composite motor cases (AF)
 - Evaluation of NASA Space Shuttle silicone foam insulation materials for thermal tile adhesives (NASA)
 - Assessment of domestic/international fiber-reinforced composites technology (IR&D, AF)
 - Assessment of Soviet fiber-reinforced composites technology (IR&D, AF)
- Instructor in Civil and Aerospace Engineering Departments on materials and structures
- Engineering Research Associate responsible for conducting research on concrete, asphaltic concrete, and polymeric composite materials for structural applications

U.S. AIR FORCE

October 1965 - September 1969

Captain, Project Engineer/Scientist

- Responsible for managing and technically directing in-house and contractual programs on advanced solid propellant technology and filament wound case pressure vessel efforts

- Project Manager for instrumented Structural Test Vehicle (STV) programs with in-situ and surface-mounted sensors for determining critical propellant/casebond performance and response properties
- Project Manager for Cumulative Damage Assessment programs and Non-Linear Viscoelasticity programs related to solid rocket propulsion grain systems
- Conducted failure investigations on several major solid rocket motor propulsion systems (Minuteman, SRAM, 2.75 FFAR, and various foreign rocket motor systems)

EDUCATIONAL EXPERIENCE

- Ph.D. Interdisciplinary Engineering (Mechanics and Materials), Texas A & M University, 1974
- M.S. Aeronautics (Materials), California Institute of Technology, 1965
- B.S. Aerospace Engineering, Texas A & M University, 1964
- Adjunct Professor, Guest Lecturer: Mechanical Engineering & Manufacturing Technology Departments, Brigham Young University
- Adjunct Professor, Guest Lecturer: Mechanical and Industrial Engineering Departments, University of Utah
- Instructor, Civil Engineering and Aerospace Engineering, Texas A&M University (1973-1974)
- Staff Engineering Research Associate, Texas A&M University (1969-1974):
 - Texas Transportation Institute (1972-1974)
 - Mechanics and Materials Research Center (1971-1972)
 - Civil Engineering Department (1969-1971)
- Research Assistant, California Institute of Technology (1964-1965)
- Numerous Specialized Training and Continuing Education Courses:
 - Export Control/International Arms Regulations (DOC/SIA)
 - Effective Business Presentations
 - Phil Crosby Quality Improvement Program
 - ISO 9000 Fundamentals Course (Society of Manufacturing Engineers/SME)
 - Impact Dynamics/Impact Assessment in Composites (UCLA)
 - Effective Proposal Preparation and Evaluation
 - Numerous Short Courses on Elastomers, Plastics, and Composites Manufacturing, Testing, Design and Processing

AWARDS & APPOINTMENTS

- Elected Society for the Advancement of Material and Process Engineering (SAMPE) Fellow, November 2002 (installed May 2003 at annual Spring meeting)
- Presidential Appointment (President Bush), U.S. Department of Commerce, Materials Technical Advisory Committee (MTAC), 2001-2002
- Suppliers of Advanced Composite Materials Association (SACMA) Materials Leadership Award (1999)
- Presidential Appointment (President Clinton), U.S. Department of Commerce, Materials Technical Advisory Committee (MTAC), 1997-2001
- Society of Manufacturing Engineers (SME) Composites Manufacturing Association (CMA) "Jud" Hall Composites Manufacturing Award (1996)
- Presidential Appointment (President Clinton), U.S. Department of Commerce, Materials Technical Advisory Committee (MTAC), 1993-1997
- Commendations from U.S. Secretary of Commerce on Export Control Regulations Negotiations for Paris COCOM Negotiations on advanced materials technology (1990-1991)
- Presidential Appointment (President Bush), U.S. Department of Commerce, Materials Technical Advisory Committee (MTAC), 1989-1993
- Member, Society of Manufacturing Engineers (SME) Composites Manufacturing Association (CMA) Advisory Board, 1992-1995
- National Academy of Science/National Research Council Unit Manufacturing Research Committee (1991-1993)
- National Research Council Advisor, Committee on Competitiveness of U.S. Composites Manufacturing, Processes and Technology (1992)
- National Science Foundation (NSF) Manufacturing Proposal Evaluation Committee, Strategic Manufacturing Initiative (1991-1993)
- Aerospace Industries Association (AIA) Committee on Key Technologies for the Year 2000:
 - Advanced Composites Technology (1990-1991)
 - Rocket Propulsion Technology (1989-1990)
- Workshop Chairman, National Research Council Committee on the Use of Composite Materials in Load-Bearing Marine Structures (1990)

- State of Utah Advisory Council on Science and Technology, Science and Advisory Committee (1985)

PUBLICATIONS & BOOKS

Authored over 250 technical publications that established industry standards for composite materials, composite/FRP structures, and solid propulsion design, analysis, testing, inspection, and manufacturing methodology. Author of critical reports on composite pressure vessel design, manufacturing and processing, test and inspection methods, damage assessment, and accept/reject criteria – current primary industry standards for assessing impact, surface cut, abrasion, and delamination damage to composite pressure vessels and tanks. Developed advanced and practical 'hands-on', technology courses for key composites manufacturing processes (filament winding, resin transfer molding, hand layup, vacuum bagging, and hybrid combinations).

JOURNALS, BOOKS, TECHNICAL PAPERS & TECHNICAL PRESENTATIONS

“Deepsea Filament Wound Pressure Vessels: Challenges in Designing and Manufacturing Thick-wall Structures for Deepwater Oilfield Operations,” JISSE-10 (10th Japan International SAMPE Symposium & Exhibition), November 27-30, 2007, Tokyo, Japan.

“Global Energy Technology: Composite Material Solutions and Applications,” JISSE-10 (10th Japan International SAMPE Symposium & Exhibition), November 27-30, 2007, Tokyo, Japan.

“Thermoplastic Composites: Market Segment Growth, Processing, Material Applications and Cost Factors,” Thermoplastic Composites Conference, November 6-7, 2007, Reno, NV.

“Infusion Processing: Today’s Closed Mold Methodologies,” SAMPE 2007 Fall Technical Conference, October 29, 2007, Cincinnati, OH.

From Art to Science: Advanced Materials & Process Engineering (Edited with D. A. Klosterman and K. L. Strong), SAMPE 2007 Fall Technical Conference, SAMPE Publishing, ISBN 978-1-934551-01-1, October 29-November 1, 2007, Cincinnati, OH.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Seminars for Engineers (Sensor Products Inc.), October 15-16, 2007, Tampa, FL.

“Inspecting Fibrous Composites: NDT Challenges, Methods and Issues,” 4-day Course at Abaris Training Resources, Reno, NV, August 27-30, 2007.

“Historical Perspective: Prepreg Technology,” SAMPE '07 Conference and Exhibition, June 3-7, 2007, Baltimore, MD.

Strategic Directions of Technologies – Emerging Trends in M&P (Edited with P. Joyce and A. Vizzini), SAMPE `07 Conference and Exhibition, SAMPE Publishing, ISBN 978-0-938994-72-5, June 3-7, 2007, Baltimore, MD.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Seminars for Engineers (Sensor Products Inc.), April 18-19, 2007, Chicago, IL.

“Ultra-Deepwater Carbon Fibre Composite Pressure Vessel Development: Dual Element Buoyancy Unit (DEBU)” (with D. Jackson, M. Dixon, B. Shephard, E. Kebabze, J. Lummus, M. Crews and P. Bunch), SAMPE Journal, Vol. 43, No. 2, March/April 2007.

“Inspecting Fibrous Composites: NDT Challenges, Methods and Issues,” 4-day Course at Abaris Training Resources, Reno, NV, January 16-19, 2007.

“Composite Materials, Design, Testing and Fabrication Workshop,” 3-day Workshop held at Arnold Engineering Development Center (AEDC), December 13-15, 2006, Arnold AFB, TN.

“Sandwich and Core Technology: Overview and Applications Update,” SAMPE 2006/Dallas Technical Conference, November 8, 2006, Dallas, TX.

“High Temperature Composites Market Overview” (with C. Red), SAMPE 2006/Dallas Technical Conference, November 8, 2006, Dallas, TX.

SAMPE Fall Technical Conference (38th ISTC) Proceedings, (Edited with L.A. Pilato and H.S. Kliger), SAMPE Publishing, ISBN 0-938-99499-9, November 2006.

“Nanotechnology – What is It, Why is it Important, What are the Advantages, etc.,” SAMPE 2006/Dallas Technical Conference, November 6, 2006, Dallas, TX.

“Metals vs. Composites” (with A. B. Strong), Composites 2006, ACMA Annual Conference, October 18, 2006, St. Louis, MO.

“Filament Winding Processing Technology,” Composites 2006, ACMA Annual Conference, October 18, 2006, St. Louis, MO.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Seminars for Engineers (Sensor Products Inc.), October 16-17, 2006, St. Louis, MO.

“Current Trends in the High Temperature Polymer Composites Market” (with C. Red), JISTES 2006, 5th Japan International SAMPE Technical Seminar, July 13, 2006, Kyoto, Japan.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Seminars for Engineers (Sensor Products Inc.), June 14-15, 2006, Denver, CO.

“Resin Infusion Processing: Methods, Limitations, Current Technology, Applications and Examples,” SAMPE `06/Long Beach Symposium, May 1, 2006, Long Beach, CA.

“Don’t Overlook Composite FRP Pipe” (with M. Greenwood), Chemical Engineering, Vol. 113, No. 5, pp. 42-48, May 2006.

SAMPE `06 Spring Conference (51st ISSE) Proceedings, (Edited with L. Cohen, C-L. Ong, R. Lipeles, S. Jenq and W. Kao), SAMPE Publishing, ISBN 0-938-99403-4, April 2006.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Seminars for Engineers (Sensor Products Inc.), March 8-9, 2006, Tampa, FL.

“Composite Fibre Reinforcement and Resin Technology Overview,” Composites Australia & The Composites CRC Annual Conference & Exhibition 2006, March 3-4, 2006, Sydney, Australia.

“Materials Selection: Filament Winding Resin Systems,” Filament Winding, Fiber Placement and Pultrusion Seminar, February 7-9, 2006, Salt Lake City, UT.

“Materials Selection: Fiber Reinforcements (Glass, Carbon, Aramid, Boron and Others),” Filament Winding, Fiber Placement and Pultrusion Seminar, February 7-9, 2006, Salt Lake City, UT.

“Materials Selection: Tooling Methods and Approaches,” Filament Winding, Fiber Placement and Pultrusion Seminar, February 7-9, 2006, Salt Lake City, UT.

“Oilfield Composites Technology: Deep Sea Applications,” 30th Northern California (NorCal) SAMPE Chapter Composites Workshop, January 26, 2006, Mountain View, CA.

“Resin Infusion Technology: Recent Advances and Applications,” 30th Northern California (NorCal) SAMPE Chapter Composites Workshop, January 26, 2006, Mountain View, CA.

“Composites Innovations and Advanced Technology Synonymous With Pacific Rim in `06,” CM, Composites Manufacturing, January 2006.

“Resin Infusion Processing: Methods, Limitations, Technology, Applications and Examples,” 9th Japan International SAMPE Symposium & Exhibition (JISSE-9), December 2, 2005, Tokyo, Japan.

“Composites Technologies Within the Energy Market: Materials, Processes and Applications,” Special Evening Lecture, 9th Japan International SAMPE Symposium & Exhibition (JISSE-9), November 29, 2005, Tokyo, Japan.

SAMPE Fall Technical Conference (37th ISTC) Proceedings, (Edited with R.G. Albers and J.S. Griffing), SAMPE Publishing, ISBN 0-938-99499-9, October 2005.

“Resin Infusion Processing: Methods, Limitations, Current Technology, Applications and Examples,” SAMPE 2005/Seattle Technical Conference, October 31, 2005, Seattle, WA.

“Filament Winding and Fiber Placement Advances: Oilfield, Energy and Wind Energy Markets,” (with D. Jackson, M. Dixon, B. Shepherd and P. Bunch), Filament Winding 2005 (3rd International Conference), October 12-14, 2005, Brussels, Belgium.

“Dual Element Buoyancy Unit (DEBU): Ultra-Deepwater Composite Pressure Vessel Development,” (with D. Jackson, M. Dixon, B. Shepherd, E. Keadze, J. Lummus, M. Crews and P. Bunch), Proceedings 4th International Conference on Composite Materials & Structures for Offshore Operations (CMOO-4), October 4-6, 2005, Houston, TX.

“Modeling and Manufacturing Thick Carbon Fibre Composites for Structural Subsea Applications,” (with D. Jackson, M. Dixon, E. Keadze, B. Shepherd and P. Bunch), Proceedings 4th International Conference on Composite Materials & Structures for Offshore Operations (CMOO-4), October 4-6, 2005, Houston, TX.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Sensor Products Inc., September 26-27, 2005, Columbus, OH.

“Bridging the Gap: FRP and Advanced Composites” (with A.B. Strong), CM, Composites Manufacturing, October 2005.

“Resin Infusion Processing: Methods, Limitations, Current Technology, Applications and Examples,” SAMPE 2005/Long Beach, May 1, 2005, Long Beach, CA.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Sensor Products Inc., March 3-4, 2005, Los Angeles, CA

“Resin Infusion Processing: Methods, Limitations, Current Technology, Applications and Examples,” SAMPE 2004/San Diego, November 15, 2004, San Diego, CA.

“Resin Infusion Technology,” Webcast Seminar, National Center for Advanced Manufacturing (NCAM), November 8-9, 2004, New Orleans, LA.

“Resin Infusion Processing: New Applications and Markets,” The Global Outlook for Carbon Fiber 2004, pre-conference Seminar on “Emerging Technologies & Future Outlook for Resin Infusion Molding,” October 18-21, 2004, Hamburg, Germany.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Sensor Products Inc., October 4-5, 2004, Tampa, FL.

“Inspecting Fibrous Composites: NDT Challenges, Methods and Issues,” 5-day Course at Abaris Training Resources, Reno, NV, September 27-October 1, 2004.

“Resin Infusion Processing Technologies,” SAMPE China-Japan International Symposium 2004, September 7, 2004, Shanghai, China.

“Filament Winding and Fiber Placement Processing Technologies,” SAMPE China-Japan International Symposium 2004, September 7, 2004, Shanghai, China.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Sensor Products Inc., August 30-31, 2004, Salt Lake City, UT.

“Overview of Non-Destructive Test (NDT) Methods for Use with Composite Materials and Structures,” 5-day Course at Abaris Training Resources, Reno, NV, May 24-28, 2004.

“Resin Infusion Technology Advances Over the Past 15 Years,” Invited Plenary Talk, SAMPE 2004, May 16, 2004, Long Beach, CA.

“Resin Infusion Technologies: RTM, VARTM and Other Primary Processes,” SAMPE 2004, May 16, 2004, Long Beach, CA.

“Composite Materials, Design, Testing and Fabrication Workshop,” 2-day Workshop sponsored by Sensor Products Inc., April 29-30, 2004, Salt Lake City, UT.

“World Composites Market: Asia and the Pacific Rim Area,” Composites Fabrication, January 2004.

“Liquid Molding & Resin Infusion Processing Technology,” 8th Japan International SAMPE Symposium & Exhibition (JISSE-8), November 21, 2003, Tokyo, Japan.

“Natural Fiber Reinforcement Materials: Lower Cost Fiber Technology for Composites Applications,” Composites Fabrication, November/December 2003.

“Resin Infusion Technologies: RTM, VARTM and Other Primary Processes,” 35th International SAMPE Technical Conference, September 28, 2003, Dayton, OH.

“Overview of Non-Destructive Test (NDT) Methods for Use with Composite Materials and Structures,” 5-day Course at Abaris Training Resources, Reno, NV, September 22-26, 2003.

“Overview of Non-Destructive Test (NDT) Methods for Use with Composite Materials and Structures,” 5-day Course at Abaris Training Resources, Reno, NV, June 2-6, 2003.

“Resin Infusion Technologies: RTM, VARTM, SCRIMP™, RFI and Others,” SAMPE 2003, May 12, 2003, Long Beach, CA.

“Composite Materials and Structures in the Automotive and Ground Transportation Markets,” Composites Fabrication, January 2003.

“Resin Infusion Technologies,” 34th ISTC, 34th International SAMPE Technical Conference, November 4, 2002, Baltimore, MD.

“Composites Technologies and Applications in the Oilfield Markets”, Workshop at The Global Outlook for Carbon Fiber 2002 Conference, October 21, 2002, Raleigh, NC.

“Overview of NDT for FRP Composites”, CFA Composites 2002, September 26, 2002, Atlanta, GA.

“Testing FRP Composites: Test Methods and Controlling Test Standards”, Composites Fabrication, August 2002.

“Infusion Moulding Techniques – Parts 1 and 2; Developments and Trends in North America, Europe and Japan – Part 1; Further Developments, Trends and Composites Technology – Part 2,” Worldwide Update on Composites Technology and Market Direction Workshop, July 29-August 8, 2002, Melbourne-Adelaide-Perth-Brisbane-Sydney, Australia (325 Power Point slide presentation – CD ROM)

“Resin Infusion Processes: RTM, VARTM, SCRIMP™, RFI & VIP”, SAMPE 2002, May 13, 2002, Long Beach, CA.

“Safety Factors and Failure Criteria: Key Areas in FRP Product Design”, Composites Fabrication, May 2002.

“What’s The Question? – Pultrusion: One of the Primary Composites Manufacturing Methods”, Composites Fabrication, April 2002.

“Filament Winding Fiber and Resin Technology”, ECM Filament Winding Workshop, March 20-22, 2002, Salt Lake City, UT.

“Filament Winding Testing, Standards and Certification”, ECM Filament Winding Workshop, March 20-22, 2002, Salt Lake City, UT.

“What’s The Question? – Fiber Technology: The ‘String’ That Ties”, Composites Fabrication, February 2002.

“Composite FRP Pipe: Gravity and Pressure Pipe – Part 1”, Composites Fabrication, February 2002.

“World Market for FRP: Asia, Latin America and Europe” (with A.B. Strong and V.D. Hawks), Composites Fabrication, January 2002.

“Comparison of Low Cost Composites Manufacturing With Advanced Composites Processing Techniques”, JISSE-7, 7th Japan International SAMPE Symposium & Exhibition, Plenary Lecture, November 13-16, 2001, Tokyo, Japan.

“Resin Infusion Processes: RTM, VARTM, RFI, SCRIMP™ and Others”, 33rd ISTC, 33rd International SAMPE Technical Conference, November 5, 2001, Seattle, WA.

“After September 11th – A Look Into the Crystal Ball for the Composites Industry” (with A.B. Strong), Composites Fabrication, November/December 2001.

“Composite Cryogenic Tank Design and Manufacturing Overview”, Utah SAMPE Chapter, October 30, 2001.

“Advanced Composites Preform Technology in the 21st Century” (with W. P. Benjamin), The Global Outlook for Carbon Fiber 2001, October 16-18, 2001, Bordeaux, France.

“RTM, VARTM, SCRIMPTM and RFI Technology Applications” (with W. P. Benjamin), The Global Outlook for Carbon Fiber 2001, October 16-18, 2001, Bordeaux, France.

“Sandwich Structure Design Methods”, Composite Fabricators Association COMPOSITES 2001, October 5, 2001, Tampa, FL.

“An Overview of Filament Winding Technology”, Composite Fabricators Association COMPOSITES 2001, October 4, 2001, Tampa, FL.

“What’s The Question? – Resins Technology: The ‘Glue’ That Binds”, Composites Fabrication, October 2001.

“Post-Processing FRP Composites: The Art of Drilling, Cutting, Machining and Getting Parts Ready to Ship, Composites Fabrication, October 2001.

“What’s The Question? – What Methods Exist for Joining FRP Composites?”, Composites Fabrication, August 2001.

“Riding on Fiber: Composites in the Automotive and Transportation Industries”, Composites Fabrication, August 2001.

“A History of Filament Winding”, Plastics Solutions International, Sterling Publications Ltd., 2001.

“Damage Tolerance: Did I Damage My FRP Composite?”, Composites Fabrication, June 2001.

“What’s The Question? – What Role do Core and Sandwich Structures Play in FRP Composite Performance?”, Composite Fabrication, June 2001.

“Resin Infusion Processes: RTM, VARTM, SCRIMPTM, RFI and VIP Technology”, SAMPE 2001, May 6, 2001, Long Beach, CA.

“An Overview of Resin Infusion Molding Technologies”, Composite Fabricators Association (CFA) Midwest Composites Conference, March 15, 2001, South Bend, IN.

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“Resin Transfer Molding (RTM) and Liquid Molding (LM) Manufacturing in Today’s Marketplace”, Cerritos College Composites Technology Workshop, October 23-24, 1995, Norwalk, CA.

“Tooling for Processing Composite Structures”, 27th International SAMPE Technical Conference, October 1995, Albuquerque, NM.

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“Internal Insulator Design for Solid Rocket Motors”, Phillips Laboratory Air Force Materials Workshop, September 1992, Edwards AB, CA.

“High Temperature Composites and Carbon-Carbon Composites”, Society of Manufacturing Engineers (SME) High Temperature Composites Workshop, August 12-13, 1992, Los Angeles, CA.

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Section II

Expert Witness, Litigation & Insurance Case History

January 2008

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EXPERT WITNESS, LITIGATION AND INSURANCE CASES

(January 2008)

- **Expert Witness and Litigation Support**
 - Consulting Expert
 - Testifying Expert
 - Design, Analysis, Testing and Forensic Services
- **Insurance Claims**
 - Consulting Expert
 - Design, Analysis, Manufacturing and Test Support
 - Testifying Expert

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Section III

BTG Composites Inc. Background & Experience
(Separate Power Point handout available upon request)

January 2008

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