SYLVAIN A. FORGUES, P. Eng. M.A.Sc.

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WORK EXPERIENCE

Founding President **2005-Present**
Shockform Aeronautique Inc.

- **Management:** Founding President responsible for all aspects of the company including Engineering, Production, Research and Development, Marketing, Finance and Accounting.
- **Strategic Orientation:** Lead management team to develop new markets and strategies for an average 45% growth in sales per year.
- **Training:** EI Senior trainer for FAA certified shot peening training with over 300 students trained on the techniques of rotary flapper peening and shot peening levels 1 and 2.
- **Affiliation:**Voting member of SAE AMEC and J SPEC committees on surface enhancement.
- **Shot Peening Expertise:** Consultant for several large Aerospace companies on improvements to their shot peening process and equipment.
- **Communication:** Authored several articles on the peening process in magazines and peer reviewed journals.
- **Product Design:** Head the Shockform multi-disciplinary (mechanical, software and PCB hardware) development team for the design of products for the Aerospace Industry including the FlapSpeed® PRO for rotary flapper peening, the Spiker® controlled needle peening tool in partnership with MTU, the Spedron® intelligent grinder and the UV-Inspect™ (vertical and horizontal) landing gear inspection system.
- **Product Certification:** Responsible for Safety and EMC testing leading to CSA and CE Certification of Shockform Products
- **Patent & Trademark:** Authored patent and trademark applications and coordinated with Patent Agent to reply to Examiner leading to 2 US patents and 3 US trademarks.
- **R&D:** Responsible for preparing the SR&ED Claims

Section Chief - R&D, Robotics and Software **2002-2005**
L-3 MAS Canada (Formerly Bombardier Aerospace Defence), Mirabel, Quebec

- **Management:** Responsible for a team of 7 engineers and technicians specialised in robotics, software development and shot peening. Duties included budget planning and tracking, resource allocation, personnel evaluation as well as individual empowerment and coaching.
- **Project Management:** Responsible for the Program aspect of key robotic and software projects including writing the proposal, preparing the cost estimates, negotiating the contract, managing production teams on international assignments, communicating results to the client, resolving payment issues as well as preparing additional work requests.
- **Research and Development:** Responsible for the vision and for the definition of several innovative projects such as the Laser Compaction of Nano-Powder and Robotic shot peening and Machining as well as the coordination of all R&D projects in the company. Specialized in collaborative research projects with Universities (École Polytechnique, McGill, RMC) and Government Research Establishment (NRC-IMI, AMTC, IAR) as well as in project financing and R&D tax credits.

Manager Structural Analysis Group **2001-2002**
Innotech-Execaire Aviation, Dorval, Quebec

- **Management:** Responsible for a team of engineers providing compliance plans, analyses (static, fatigue and damage tolerance), and maintenance manual supplements for repairs and modifications to aircraft structure as per applicable FAR requirements.
- **Business Development**: Solicitation of new contracts through meetings with potential clients, audio-visual presentations and of offer of services submittals.
- **Research and Development:** Responsible for the definition and technical supervision of R&D projects on damage tolerance, air ambulance configuration and loads derivation.
- **Transport Can. Delegate Engineer:** Candidate delegate engineer under Innotech's DAO.

Aircraft Structural Engineer **1993-2001**
Bombardier Aerospace, Dorval and Mirabel, Quebec

- **Structural Analysis**: Responsible for the forward, mid and aft fuselage of the Canadair Regional Jet (CRJ). Performed several in-depth analyses including detailed linear or non-linear Finite Element Analysis (FEA), flight test definition and supervision, revision of the load spectrum, and Damage Tolerance Analysis (DTA) to evaluate inspection requirements.
- **Experimental Testing**: Managed a major experimental test program on shot peening involving laboratories from QETE, École Polytechnique and the Royal Military College. Tasks included overall coordination as well as test plan preparation, coupon design, process supervision, statistical data analysis and presentation of results to the client.
- **University/Industry R&D Projects**: Collaborated with University Professors on several innovative projects aimed at improving structural performance through shot peening and other fatigue enhancing techniques. Responsibilities included project definition, contract negotiation, supervision of Master's students working on the projects, data analysis and application to the fleet.
- **Robotic Shot-Peening:** Structures expert in a multi-disciplinary R&D team mandated to robotize difficult manual shot peening tasks within a maintenance environment. Responsible for shot peening specification compliance, project risk analysis, peening process definition, test rig design and data analysis.
- **Software Development**: Headed a team of 3 engineers involved in the development of a probabilistic durability and damage tolerance fleet management software. Responsible for all the technical aspects of the DIRP sponsored project including analysis, design, development, test and validation of the software as well as budget and schedule management.
- **Communication:** Authored several technical reports summarising analysis and research results. Communicated these results to the clients through audio-visual presentations. Promoted Bombardier Services at corporate kiosks during the USAF Aircraft Structural Integrity Program (ASIP) Conferences held in San Antonio, Texas in 1995, 1996 and 1997.

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EDUCATION

M.A.Sc in Mechanical Engineering **1991-1993**
École Polytechnique of Montreal

- Master's thesis studying the effect of compressive residual stresses introduced by split sleeve coldworking on the fatigue lives of fastener holes. Project in collaboration with Bombardier Inc./Canadair and the department of Energy, Mines and Resources Canada.
- Side project to study shot peening parameters and techniques for a major Defense client.

B.A.Sc in Mechanical Engineering (Co-op) **1986-1990**
University of Ottawa

- Graduated with CUM LAUDE distinctions; Co-op work terms at The Canadian Space Agency, Siemens-Bendix Automotive, Kimberly Clark , and Supply and Services Canada.

CONTINUING EDUCATION

- Preparing Successful SR&ED Claims, Scitax, February 2014
- Winning at Product Innovation, IDP, 2 day course, April 2013
- Business Management and Financing, 2 day course, November 2012
- New Product Development, Laurentides International, November 2011
- Sales: Techniques et Strategies, Galilée Formation, October 2008
- Product Development, Colloque OIQ, June 2008
- Best Practice in Product Development, Colloque OIQ, June 2008
- Train the Trainer, 1 day course, December 2004
- Managing Difficult Employees, 1 day course, November, 2004
- Effective Negotiating: The Karrass Method, 2 day course, November, 2004
- Time Management, The Gamonnet Method, 1day course, June 2003
- Change Management – Helping Others Adapt, 1 day course, October 2003
- The Empowering Leader – Basic Skills to Develop Commitment, 2 day course, May 2003
- Introduction to ISO 9001:2000 Level 1, ½ day course, November 2002
- Management Techniques and Competences, 2 day course, June 2002

SKILLS

- Strong Communication and Presentation Skills
- Excellent language proficiency in both written and spoken French and English
- Strong interpersonal and organisational skills
- Ability to acquire new skills rapidly
- Strong entrepreneurial spirit
- Proficiency with Microsoft Project, Word, Excel, Access and Powerpoint
- Good knowledge of SOLIDWORKS, CATIA and AUTOCAD software
- Excellent knowledge of finite element analysis tools (NASTRAN/PATRAN, ABAQUS)
- Knowledge of the TAGUCHI method of quality control

PUBLICATIONS AND CONFERENCES

- Presented Flapper Peening and other training material at **EI Shot Peening Workshops** from 2008 to 2014.
- Polanetzki, H., Huber, N., Forgues, S.A., Wollmann, M., Becker, C., Wagner, L., **The Comparison of a New Needle Peening Process with Conventional Shot Peening and Rotary Flapper Peening**, Conf. Proc., International Conference on Shot Peening, ICSP-12, 2014, Goslar, Germany
- Forgues, S.A., Labelle, B., King, M., Manor, N., **Controlled Rotary Flap Peening for Repair Applications**, Conf. Proc., International Conference on Shot Peening, ICSP-11, 2011, South Bend, USA
- Forgues, S.A., **Variability Study of the Flapper Peening Process**, The Shot Peener Magazine, Vol 24 / Issue 2, Spring 2010.
- Forgues, S.A., Duchazeaubeneix, Desfontaine, Labelle, **On-aircraft Shot Peening Application Using The Stressonic Process**, Conf Proc., International Conference on Shot Peening, ICSP-10, 2008, Tokyo, Japan.
- Forgues, S.A., **Extending the Fatigue Life of Bridges Using Stressonic Needle Peening**, The Shot Peener magazine, Vol 21 / Issue 4, Fall 2007
- Presented Ultrasonic Activated Shot Peening at **EI Shot Peening Workshop** in 2006 and 2007.
- Attended the **ASIP Conference** in San Antonio in November 2006 as well as the **Aging Aircraft Conference** in Palm Springs in April 2007.
- Forgues, S.A., "**Evolution of Shot Peening on the CF-18 - From OEM to Robotic**" Conf. Proc., International Conference on Shot Peening, ICSP-9, 2005, Paris, France.
- Forgues, S.A., "**Articulated Robots - New Tools for Structural Fatigue Life Improvements**" Presented at the Canadian Aeronautics and Space Institute Conference, Toronto, April 2005
- Attended the 2005 Aging Aircraft Conference, Palm Springs, California, January 2005
- Forgues, S.A., "**Robotized Shot Peening Process for On-Aircraft Applications: From Simulation to Production**" Presented at the SAE Aerospace Congress and Exhibit, Montreal, Sept. 2003.
- Forgues, S.A., Kioua, H. "**In-Situ Robotic Shot Peening for the Fatigue Life Improvement of Aircraft Structures**" Presented at the Canadian Aeronautics and Space Institute Conference, Montreal, April 2003
- Attended the International Conference on Shot Peening **(ICSP-8**), Garmisch-Partenkirchen (Germany), September 2002.
- Forgues, S.A., "**Effect of Compressive Loading on Shot Peening Life Improvement**" Presented at the Canadian Aeronautics and Space Institute Conference, Montreal, April 2003
- Attended the Second Joint NASA/FAA/DOD Conference on Aging Aircraft, Williamsburg, Virginia, August 1998
- Forgues, S.A., Thériault, Y., "**Probabilistic Damage Tolerance Analysis for Optimising In-Service Inspections**", presented at the International Conference for Aeronautical Fatigue (ICAF), Edinburg, Scotland, June 1997.
- Attended the USAF Aircraft Structural Integrity Program (ASIP) Conference, San Antonio, Texas, December 1995, 1996 and 1997

- Attended the International Conference on Shot Peening **(ICSP-6**), San-Francisco, California, September 1996.
- Forgues, S.A., Thériault, Y., "**A Collaborative R&D Investigation on Quantifying the Combined Effects of Coldworking and Interference Fit Fastening**", presented at the Third Aircraft Structural Integrity Symposium, Ottawa, Canada, September 1994.
- Bernard, M., Bui-Quoc, T, Julien, D., Forgues, S.A., "**Feasibility Study of Cold Expansion Processes Modelling**", Canadian Department of Defence, Tech. Rep., Contract W8477-1-AC89101-SS, June 1993.
- Forgues, S.A., Bernard, M., Bui-Quoc, T., "**3-D Axisymmetric Numerical Analysis and Experimental Study of the Fastener Hole Coldworking Process**". Presented at the "1st International Conference on Surface Treatment", Wessex Institute of Technology, Southampton, UK, April 1993.
- Singal, R.K., Gorman, D.J., Forgues, S.A., "**A Comprehensive Analytical Solution for Free Vibration of Rectangular Plates with Classical Edge Conditions: Experimental Verification**", Journal of Experimental Mechanics, March 1992, 21-23.

AFFILIATIONS

- Member of the Quebec Order of Professional Engineers
- Member of SAE AMEC committee on surface enhancement
- Member of SAE J SPEC committee on surface enhancement

REFERENCES

- Provided upon request