François Besnier – francois@besnier.net – (602) 318-7254

EXPERIENCE

PARKER CSD, Irvine, CA, USA   October 2008 – present
System Safety Engineer in Flight-By-Wire- Consultant

- Wrote Fault Tree Analysis (FTA), System FMEA and System Safety Analysis (SSA) for the Embraer Legacy 500 and Bombardier C-Series fly-by-wire system.
- Produced IIM and REU detailed FMEAs.
- Produced derived safety requirements to support new ARP4754A system development strategy.
- Coordinate the system safety activities with suppliers (Rockwell-Collins, SKF).

HUAWEI, Shenzhen, China   September 2015 – December 2015
Consultant

- Supported Huawei corporate reliability department to explore possible ways to improve the quality of service in the information and communications technology industry with methods, techniques, and tools that were successfully used in the aviation industry (e.g. for fly-by-wire flight controls) to achieve 1E-9 per hour of unavailability.

HONEYWELL AEROSPACE, Glendale, AZ, USA   February 2005 – February 2010
System Safety Engineer in Avionics and Flight Controls - Consultant

- Produced the Fault Tree Analysis (FTA) for the primary flight controls of the Boeing 787 Fly-By-Wire system Flight Control Electronic (FCE), which also comprises the autoflight function.
- Wrote associated FCE System Safety Analysis (SSA) documentation.
- Helped writing FCE system safety guidelines and plans.
- Wrote Preliminary System Safety Analysis (PSSA) on related Honeywell research activities for advanced fault tolerant Fly-By-Wire systems (Digital Flight Control System (DFCS) project with NASA).
- Wrote System Safety Analysis (SSA) for the Honeywell KSG7200 Air Data Attitude Heading Reference System (ADAHRS) airborne on Dassault F7X and Pilatus PC12 planes.
- Produced the Pilatus PC12 Preliminary Common Mode Analysis (PCMA) of the Honeywell EPIC Automatic Flight Control System (AFCS).
- Updated the System Safety Analysis (SSA) previously created for Primus EPIC AFCS and ACAC ARJ21.

SMITHS AEROSPACE (now GE Aviation) @ BOEING, Everett, WA, USA   January 2005 – July 2005
System Safety Engineer for the Boeing 787 Landing Gear Control System

- Produced the Preliminary System Safety Analyses (PSSA) for the Boeing 787 Brake System and Nose Wheel Steering.

HONEYWELL AEROSPACE, Glendale, AZ, USA　　　　　　　　　**August 2001 – July 2003**
　　　System Safety Engineer in Avionics and Flight Controls　　　**February 2004 – January 2005**

- Responsible for the production of the Preliminary System Safety Analysis for the fly-by-wire controls of the ARJ21 regional jet of China's AVIC I Commercial Aircraft Co. (ACAC).

- Responsible for the production of certification documentation: System Safety Analyses (SSA) and/or Common Mode Analyses (CMA) on the Primus EPIC AFCS for one helicopter (AgustaWestland AW139) and the following fixed wing aircrafts:
  - Embraer ERJ170/175/190/195,
  - Dornier Do728 (*discontinued*),
  - Gulfstream G500, G550,
  - Dassault Falcon F900EX EASy, F2000 EASy, F7X,
  - Raytheon Hawker 4000 Horizon,
  - Cessna Citation Sovereign.
  The AFCS is highly integrated and typically provides the following functions: autopilot, flight director, yaw damper, stall warning & stall protection, auto-throttle, pitch autotrim, and Mach trim.

- Wrote safety documentation to FAA / EASA system safety regulation (FAR/JAR 25.1309), using guidance provided by SAE ARP-4761, and SAE ARP-4754.

- Derived software and hardware design assurance levels as per RTCA DO-178B and RTCA DO-254 to support design activities.

- Used Matlab Simulink to analyze control laws and propose design improvements, when required.

BOMBARDIER AEROSPACE, Montréal, Canada　　　　　　　　**September 2000 - August 2001**

　　　System Safety, Reliability and Maintainability Engineer

- System Safety Engineer, responsible in charge of the secondary flight controls (Pitch trim / Horizontal Stabilizer, Spoilers, Flaps) and the electrical power generation system for the Continental Business Jet.

- Responsible for the production or review of the following Safety documentation:
  - Fault Tree Analysis (FTA),
  - System Safety Analysis (SSA),
  - Failure Mode Effect and Criticality Analysis (FMECA),
  - Functional Hazard Analysis (FHA),
  - Fire Hazard Analysis,

- Involved with Airworthiness Authorities (Transport Canada) regarding the Safety demonstration of Airworthiness as per JAR/FAR Part 25 (essentially § 25.1309) for the above systems.

- Co-ordinate Safety activities with partners in Europe and in U.S. (Moog, E.C.E, Liebherr).

SEXTANT AVIONIQUE (now THALES), Toronto, Canada　　　　**January 1997 - February 2000**

　　　Avionics System Safety & Reliability Engineer

- Responsible for Safety & Reliability certification of the avionics suite on the Bombardier Aerospace DASH 8Q400 regional Turboprop aircraft (more than 100 LRUs including the following flight controls: Stall Protection System and Autopilot).

- Negotiated with Bombardier and Transport Canada (TCA) with regard to Safety & Reliability contractual requirements and Safety guidelines.

- Produced most of the Avionics Safety & Reliability documentation from the preliminary design to the final certification (e.g. system FMECA, Software Safety Level Assessment, Fault Tree Analysis and System Safety Analysis, MMEL consolidation, Dispatch Analysis, etc.).

- Presented analysis results to the Airworthiness Authorities (Transport Canada) or their representative (DAD).

LIGERON S.A, France   **May 1994 – January 1997**[*]

> *System Safety & Reliability Engineer*

<u>Missions performed for LIGERON S.A. in the Aerospace industry</u>

MICROTURBO, Toulouse
- Developed and produced Safety analysis for the APU328 on the SAAB JAS 39 aircraft (mechanical reliability prediction of turbine blades, fire analysis and Fault Tree Analysis).

TECHNOFAN, Toulouse
- Responsible for methodological support of statistical methods for failure analysis and MTBUR report (applicable to an air fan used in A320 Airbus).

TURBOMECA, Bordes
- Resolved technical difficulties of 3D ARBIZON engines of the MILAS missile achieved through a functional approach and systematic specialist interviews.
- Co-ordinated meetings of missile experts on technical topics, such as software, hardware, fuel hydraulics, mechanics and aerodynamics.
- Gave advice to the Safety & Reliability Department on how to manage reliability and safety activities in preliminary design phase.

CNES, Toulouse
- Assisted the Project Manager in evaluating Safety & Reliability analysis for Advanced Gradient Heating Furnace (AGHF) that flew in Space Lab (NASA STS78) in June 1996.
- Wrote "Presentation de methodes comparatives pour la securisation d'experiences scientifiques" article for the Lambda-Mu10 National Conference held in Saint Malo, France, 1996.
- Produced technical manual to monitor software reliability during the initial stages of development (technical specifications and design).

ALCATEL ESPACE, Toulouse
- Responsible for Risk Management analysis and meeting tight deadlines on an ongoing basis regarding telecommunications equipment used for satellite constellation (WorldStar).

<u>Missions performed for LIGERON S.A. in the Railway industry</u>

CSEE TRANSPORT, Les Ulis
- Developed and produced Safety & Reliability analysis documents for a new electronic speed control device intended for the next European TGV (high-speed train).
- Developed Safety & Reliability plans to comply with CENELEC regulations.
- Produced System Safety Analysis (FMECA based on MIL-STD-1629 and Fault Trees).

FAIVELEY TRANSPORT, La Ville aux Dames
- Produced Safety Analysis on train brake systems (Functional Analysis SADT/SART, Fault Trees).
- Trained software engineers on techniques and tools to design and validate embedded real-time software for safety critical applications.

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[*] Note that I was employed by LIGERON S.A. from May 1994 to February 1998. I was expatriated by LIGERON S.A. in Toronto from January 1997 to February 1998. I have worked as contract engineer since then.

RATP, Paris
- Developed reverse engineering analysis on real-time software (from low-level assembly language to functional analysis).
- Produced Hazard and Safety analysis on critical embedded software for wheel anti-blocking and anti-skid system embedded on RER A.
- Designed specific analysis tools for reverse engineering analysis (machine code to specification).

Missions performed for LIGERON S.A. in the other industries

REEL (Nuclear Power), St-Cyr-au-Mont-d'Or
- Guided Software Quality strategies for safety critical software used on overhead cranes to load or unload fuel assemblies in reactors of EDF 900 MWe nuclear power plants.
- Trained engineers on Software Quality Assurance.

GEC ALSTHOM BERGERON (Pumping), Fontenay-sous-bois
- Conducted an availability analysis for a salt water pumping station in Qatar, using Reliability Diagram Blocks.

GLCS-ITECH, Montreuil, France   **September 1992 - May 1994**

Engineer and Project Manager

- Responsible for program and technical management of research projects with advanced laboratories in the field of mechanical, thermal and material sciences for space technology advancement (e.g. ball bearings of ARIANE 4 Vulcain turbo-pump).
- Liaised with CNES and physicists regarding models, tests, methodology, planning and contracts on various research programs (e.g. GDR CNRS 916, GRT CNES).
- Developed scientific software for advanced research programs in space mechanics (using C and Fortran).
- Specified and designed a Windows interface of 3D finite element method (using C/C++ and Visual Basic).
- Provided mechanical expertise independently, or in collaboration with other experts.

DEC TELECOM ENGINEERING GROUP, New Hampshire, USA   **July 1990 - January 1991**

Software Engineer

- Optimised VAX VMS RDB database for telecommunications purposes.
- Specified SCP/SMS interface on intelligent networks (e.g. 800 numbers application over SS7).

EDUCATION

Dual "Diploma of Engineer" (considered between B.Sc. and M.Sc.):

Diplome d'Ingenieur Ecole Nationale Superieure des Telecommunications, Paris   1989-1991

M.Sc. EE - Computer Science, Electronics, Networking, Communication, Signal processing.

Diplome d'Ingenieur Ecole Nationale Superieure d'Arts et Metiers, Paris   1986-1989

M.Sc. ME - Mechanical engineering, Industrial engineering, Systems engineering.

Honor: Silver Medal

Thesis in 1989: Design and programming of a software tool to store, organize and access technical knowledge (user: CNES, i.e. French National Space Agency).

Thesis in 1988: Electronic design and programming of a multi-processor testing device.

IT SKILLS

- Worked with various programming languages: Visual C++, Visual Basic, Pascal, Fortran, Assembly language (e.g. Motorola 680x0, Intel 80x86, Nec 7810), Forth, Shell, Perl / Tk, PHP, Prolog, LISP.
- Main OS known: Windows 98/NT/2000/XP, Mac OS X, Linux (Red Hat, Debian), UNIX.
- Experienced Web site administration: HTML, IIS, Apache, CGI, Active Server Pages (ASP), Perl, PHP, VB Script, JavaScript, ODBC, socket programming, Internet Security.
- Database system practised: VMS RDB, Access, MySQL, DBase, SQL.
- Highly proficient with Microsoft Tools (and VB programming): Word, Excel, Access, Outlook, Project, Exchange.
- Also highly proficient with other various CAD and engineering tools, such as Finite Element or reliability modeling software (Faultrease, RiskSpectrum, Fault Tree + and CAFTA).
- Designed and wrote my own fault tree analysis tool which provides original fault tree analysis capabilities

OTHER

- Languages: Fluent English & French
- Citizenships from US, France, and Canada.