

**Brad A. McGoran, P.E., CSCIP, CSCIP/G**  
**Principal Engineer**

**Professional Profile**

Mr. Brad A. McGoran is a Principal Engineer at Exponent Inc, headquartered in Menlo Park. Mr. McGoran addresses issues related to structural and mechanical system failures, product design, materials failures, product reliability analysis, quality control, and standards conformance. Mr. McGoran has particular expertise in the areas of design evaluation, safety, and risk assessment of mechanical systems and machine components. He has performed experimental testing of performance and reliability. He has done risk analysis of numerous products and systems. In addition, he has experience with vehicle, automotive, and aircraft accident reconstruction analysis and computer simulations. Mr. McGoran has extensive experience and knowledge of Smart Card technology and is presently managing major projects for the Department of Defense and related clients concerning contact and contactless smartcards, card failure analysis, deployment programs, card related equipment, SIM cards, RFID, electronic passports, and biometrics.

Mr. McGoran opened and was the General Manager of Exponent's China office from May 2005–February 2008.

**Academic Credentials and Professional Honors**

M.S., Aeronautical Engineering, Stanford University, 1996  
B.S., Mechanical Engineering, Stanford University, 1995  
Oxford University, United Kingdom, Turbomachinery and Fluid Mechanics

Henry O. Fuchs Award for Excellence in Design, Stanford University, Department of Mechanical Engineering; Award for Excellence in Engineering Design, American Society for Engineering Education

Trained in Solidworks Modeling

**Licenses and Certifications**

Registered Professional Mechanical Engineer, California, # M31027  
Certified Smart Card Industry Professional (CSCIP)  
Certified Smart Card Industry Professional for Government (CSCIP/G)

HAZWOPER Certification No. 18178, Hazardous Waste Operations and Emergency Response Certification per 29CFR1910.120 and Cal-OSHA GISO 5192

Pilot-in-Training, certified for solo flight

## **Languages**

French, Mandarin Chinese

## **Patents**

US Patent No. 7,936,274: Shield for Radio Frequency ID Tag or Contactless Smart Card, issued May 3, 2011 (Shkolnikov Y, Du Y, McGoran B).

## **Selected Publications**

Martin R, Zhang F, McGoran B. Propane appliances on small vessels: Personal injury flash fire. *Heat Treatment of Metals* 2007; 32:95–98. Proceedings of the 2007 China National Failure Analysis Conference, Changsha, China, November 2007.

McGoran B, Ross B, Zhang F. The Interdisciplinary nature of failure analysis. *Heat Treatment of Metals* 2007; 32:11. Proceedings of the 2007 China National Failure Analysis Conference, Changsha, China, November 2007.

McGoran B, Nunes S, Buehler C, Ross B. Role of process monitoring in a chemical plant explosion. Proceedings, 2006 International Symposium on Safety Science and Technology, Changsha, China, October 24–27, 2006.

McGoran B, Ross B, Nunes S, Buehler C, Reza A, Kemal A, Fessler J, Belanger J, Arnold D. Evaluation of a chemical plant explosion and lessons learned. Proceedings, Safety and Reliability, Annual Meeting of the Chinese Mechanical Engineering Society and 1<sup>st</sup> Annual Meeting of the Chinese Academy of Engineering, Mechanics and Transportation Engineering Division, pp. 252–257, 2006.

Duffner D, McGoran B. Composite pressure vessel design optimization. *Advancing Affordable Materials Technology*, International Society for the Advancement of Material and Process Engineering (SAMPE) Technical Conference Series, Falcone A, Nelson KM, Albers R, and Avery WB (Eds), Vol. 33, pp. 214–221, 2001.

## **Selected Reports**

McGoran B, Fessler J. Independent validation and verification testing of the GemXpressoPro 64K cards. Exponent Inc. Report to Gemplus Corporation, November 2005.

McGoran B. Support for the transport of Pratt & Whitney gas turbine generator components for the JingXing power plant. Exponent Report to Zhejiang JingXing Gas & Thermal Power Co., October 2005.

McGoran B, Fessler J. Independent validation and verification of Axalto test cards. Exponent Inc, Report to Axalto Corp, September 2004.

McGoran B, Mallett R. DMDC printer evaluation and test results. Exponent Report to the Defense Manpower Data Center, March 2004.

McGoran B. Testing and analysis of CAC printing failures 2/2002-9/2002 returns. Exponent Inc. Report to Defense Manpower Data Center, January 2003.

McGoran B. Reliability and durability of dual-sided lamination for the common access card. Report to the Defense Manpower Data Center, October 2002.

McGoran B. Test report: Independent validation and verification of Schlumberger test cards. Exponent Failure Analysis Associates Report to the US Government Defense Manpower Data Center, June 2001.

McGoran B. DMDC Smart Card project summary report. Exponent Failure Analysis Associates Report to the US Government Defense Manpower Data Center, December 2000.

Wu M, McGoran B, Foulds J. Structural integrity evaluation of the United Kingdom infrared telescope mirror and encoder lifting devices. Report SF26618/COFO/9903/UKIRT, Exponent Failure Analysis Associates, Inc., March 1999.

McGoran B. Analysis of the design and integrity of the Kensington MicroSaver security system. Exponent Failure Analysis Associates, Inc., Report to Kensington, March 1998.

McGoran B. Investigation of damage sustained by a PACE Makeup air unit. Failure Analysis Associates, Inc., Report to BC Environmental Facilities, Inc., February 1998.

McGoran B. Evaluation of steel rolling door. Failure Analysis Associates, Inc., Report to State Farm Insurance, December 1997.

McGoran B. Research investigation: Effect of tire mixing on vehicle performance and handling. Failure Analysis Associates, Inc., Report, February 1996.

Ross B, McGoran B. Inspection of a tractor rollover accident. Failure Analysis Associates, Inc., Report, August 1995.

McGoran B, Cassidy J, Qarnain S. Design of a lifting cart for burn patients. Engineering Design Report, Stanford University, June 1995.

### **Selected Presentations**

McGoran B. Examples of US government smart ID implementations and reliability testing techniques. 3<sup>rd</sup> Asia Smart Label/RFID Conference, Shanghai, China, October 2005.

McGoran B, Fessler J, McCarthy R. Application of accelerated testing techniques to enhance durability and reliability of the DoD identification smartcard. 11<sup>th</sup> Annual Workshop on Accelerated Stress Testing and Reliability, Austin, TX, October 2005.

McGoran B. Pre-Issuance card testing. 4<sup>th</sup> Annual Smartcards in eGovernment Conference, Washington, DC, March 8–11, 2005.

McGoran B, McCarthy R. Exponent Inc., Presentation to the Chinese Academy of Engineering, December 2004.

McGoran B, Park G, McCarthy, R, Luker B. Presentation to Beijing Olympic Committee regarding Olympics security consulting, Beijing, China, December 2004.

McGoran B. Security engineering and tools. San Mateo County Sheriff's Department, Redwood City, CA, October 29, 2004.

McGoran B. Techniques of failure analysis. Lecturer, Stanford University, Palo Alto, CA, April 21, 2003.

McGoran B. Common access card failure analysis and quality assurance. Presentation to the Department of Defense Smart Card Senior Coordinating Group, United States Pentagon, Washington D.C., February 6, 2002.

McGoran B. Techniques of failure analysis. Rotary Club, Walnut Creek Chapter, July 2002.

McGoran B. What went wrong? Techniques of failure analysis. Keynote Speaker, American Society of Mechanical Engineers, Conference, September 2002.

McGoran B. Common access card failure analysis and quality assurance. Presentation to the Department of Defense Smart Card Senior Coordinating Group, United States Pentagon, Washington D.C., August 2001.

McGoran B. Techniques of failure analysis. Lecturer, Stanford University, Palo Alto, CA, May 2001.

Buehler C, McGoran B, Nunes S, Ross B. Role of process monitoring in a chemical plant explosion. American Institute of Chemical Engineers, 35<sup>th</sup> Annual Loss Prevention Symposium, AIChE Spring National Meeting, Houston, TX, April, 2001.

McGoran B. Investigation of an ammonium nitrate plant explosion: Lessons learned. American Society of Safety Engineers, Invited Lecturer, Sunnyvale, CA, July 2000.

Ross B, Walter F, McGoran B. Mini excavators and narrow scissors lifts—create new safety concerns. 2<sup>nd</sup> International Conference for Implementation of Safety and Health on Construction Sites, Honolulu, HI, March 1999.

## **Project Experience**

Under contract to the Department of Defense, Exponent is helping to increase the reliability of smart identification cards. This effort is in support of the Defense Manpower Data Center's (DMDC's) release of the Department of Defense Common Access Card (CAC). The CAC is a leading-edge Java-based smart card that provides logical and physical access to Department of Defense computer systems and bases and is deployed worldwide to more than 4 million military and civilian personnel. Exponent currently tests the CAC for compliance to existing government and international specifications, performs failure analysis on the cards, and makes recommendations to improve specifications and reliability of future iterations of smart cards. Exponent analyzes the cards using nondestructive techniques including high-resolution, real-time x-ray imaging, which can show details as minute as the solder joints used to connect the smart card computer chip to external contacts. By identifying repetitive failure modes and causes, Exponent suggests changes to the DMDC specifications that will minimize future failures. These recommendations help increase the reliability of the cards and provide significant savings to the DMDC.

Mr. McGoran has also been helping the DoD and other clients perform Independent Verification and Validation testing in accordance with the FIPS201 requirements for card construction, performance, printability, and durability.

## **Professional Affiliations**

- American Institute of Aeronautics and Astronautics
- American Society of Mechanical Engineers
- Society of Automotive Engineers
- American Society for Engineering Education
- California Society of Professional Engineers
- National Society of Professional Engineers
- China Information and Networking Association
- Chinese American Semiconductor Professionals Association
- National Council for Information Technology Standards, Group B10, Identification Cards and Related Devices
- United States Smartcard Alliance