

Karen M. Balavich
Manager

Professional Profile

Ms. Karen Balavich is a Manager in Exponent's Vehicle Engineering practice. Ms. Balavich is an experienced automotive design engineer with expertise in motor vehicle safety specializing in vehicle restraint systems. She has knowledge in designing and evaluating vehicle restraint systems which align with the requirements of the Federal Motor Vehicle Safety Standards (FMVSS), guidelines suggested by the Insurance Institutes for Highway Safety (IIHS), and procedures developed by other recognized industry working groups. Ms. Balavich has also had the opportunity to apply her airbag knowledge to other innovative applications outside the vehicle restraint area.

Prior to joining Exponent, Ms. Balavich held the position of Technical Expert in Side Impact and Rollover Restraints at the Ford Motor Company where she was the technical leader in the design, development, and implementation of the safety technology for the industry's first rollover curtain system, the Ford Safety Canopy. She also directed and implemented the industry's first application in the 2002.5 Model Year Ford Explorer/Mercury Mountaineer. In her position at Ford, Ms. Balavich researched and developed rollover curtain designs to align with the NHTSA ejection mitigation proposal. Ms. Balavich also developed side airbag and roof rail curtain airbag designs to meet the IIHS side impact evaluation ratings and the new FMVSS 214 side impact standards. She has researched and applied side impact and rollover evaluation methods to alternative technologies such as inflatable tubular structures, glazing, and seat belt system performance. Prior to her position as Technical Expert, she held Design Engineering positions in Vehicle Restraints, Door Systems, and Corrosion Protection Engineering also with Ford.

Academic Credentials and Professional Honors

M.S., Finance, Walsh College, 1993

B.S., Mechanical Engineering, Michigan Technological University, 1988

Patents

US 7,686,332 B2: Integrated Side Impact Air Bag With Single Layer Sail Panels, March 30, 2010 (W.M. Abramczyk, E. Valdez, K.B. Balavich).

US 7,338,070: A Multi Chamber Airbag for a Motor Vehicle, March 04, 2008 (K. Balavich, J. Belwafa, C. Madasamy).

US 7,178,827: Occupant Ejection Prevention Assembly, February 20, 2007 (K. Balavich, C. Chou, J. Le, F. Wu).

US 20060131845 A1: A Multi Chamber Airbag for a Motor Vehicle, June 22, 2006 (K. Aekbote, K. Balavich, J. Belwafa).

JP2005225487: Occupant Release Prevention Assembly, August 25, 2005 (K. Balavich, C. Chou, J. Le, F. Wu).

US 20070108745: Side Impact Air Bag, May 17, 2005 (K. Balavich, J. Belwafa, B. Spahn, I. Reyes-Helfrich).

US 6,237,943 B1: Vehicle Rollover Curtain with Improved Deployment, May 29, 2001 (K. Balavich, J.R. Brown, J.A. Zychowicz).

Publications

Balavich K, Soderborg N, Lange R, Pearce H. Deployment characteristics of seat mounted side impact airbags. 22nd International Technical Conference on the Enhanced Safety of Vehicles (ESV), Paper 11-0358, 2011.

Lange R, Soderborg N, Pearce H, Balavich K, Huang S. Side impact airbag efficacy, injury mitigation performance in vehicle models with and without side impact air bags and inflatable head protection. 22nd International Technical Conference on the Enhanced Safety of Vehicles (ESV), Paper 11-0115, 2011.

Balavich KM, McCoy RW. Analysis of a prototype electric retractor, a seat belt pre-tensioning device and dummy lateral motion prior to vehicle rollover. SAE Paper 05B-27, SAE 2005 World Congress.

Balavich KM, Nayef E. Dummy head kinematics in tripped rollover tests and a test method to evaluate the effect of curtain airbag deployment. SAE Paper 02B-193, SAE 2002 World Congress.

Presentations

Balavich K, Heller M. Exponent – Real world outcomes of rollover collisions involving rollover activated curtain airbags. 2011 SAE Government Industry Meeting, Washington DC, January 2011.

Balavich K, Leigh M. Ford Motor Company—Ford ejection mitigation. Presentation to NHTSA (NHTSA-2006-26467-0002), Washington DC, February 2007.

Balavich K, Clark T. Safety canopy system overview. SAE Rollover Forum, Dearborn, MI, February 2004.

Balavich K. Occupant impact energy level study for development of a component containment evaluation method. The Alliance of Automotive Manufacturers Meeting, Southfield, MI, July 2003.

Balavich K, Nayef E. Dummy head kinematics in tripped rollover tests and a test method to evaluate the effect of curtain airbag deployment. 2002 SAE World Congress, SAE Paper 02B-193, Detroit, MI, April 2002.

Balavich K. Side airbags as supplemental protection in rollover accidents. SAE Government Industry Meeting, Washington DC, May 2000.

Prior Experience

Technical Expert Side Impact and Rollover Restraints, Ford Motor Company, 2000–2007
Design Engineer Side Impact and Rollover Restraints, Ford Motor Company, 1998–1999
Vehicle Design Engineer, Escort/Tracer Door Systems, Ford Motor Company, 1994–1997
Design Engineer, Corrosion Protection Engineering, Ford Motor Company, 1990–1993
Ford College Graduate Program, Ford Motor Company, 1988–1989

Professional Affiliations

- Society of Automotive Engineers (member)