

**Steven R. Arndt, Ph.D., CHFP**  
**Principal**

**Professional Profile**

Dr. Steve Arndt is an Industrial Engineer in Exponent's Human Factors practice. Dr. Arndt specializes in human factors, ergonomics, operator behavior with regard to perception response time, and consumer and occupational safety. He provides consultation in the investigation and prevention of accidents and injuries with consumer products in the home and industrial products in occupational environments.

Dr. Arndt has performed investigations of occupational and industrial incidents involving machine guarding, fall protection, and materials handling. He has assisted in the selection and development of safety systems for consumer and industrial equipment. He has performed accident risk and injury analyses for consumer products, industrial machines and systems including, fall protection and fall prevention systems, presses, conveyors, forklifts, scaffolding, aerial boom lifts, excavation equipment, amusement park attractions, auditory warnings and signals as well as others.

Dr. Arndt has also designed and evaluated warnings, labeling, instructions, manuals, MSDS and other collateral materials for consumer and industrial products by applying government and voluntary standards, data gathered from scientific literature, product history data, accident and injury databases, and focus group testing. Dr. Arndt has participated in consumer product recalls by assisting manufacturers in defining the scope of potential recalls, testing, and development of announcements and instructions, and design and evaluation of retrofit parts for compliance with Consumer Product Safety Commission (CPSC) recommendations. He has performed risk, injury, and accident mode assessments of accident patterns associated with consumer products using nationally collected hospital emergency room injury data from the CPSC's National Electronic Injury Surveillance System (NEISS).

He also investigates operator behaviors, decision making, perceptions and response times associated with lines of sight and, visibility and conspicuity, associated with both automotive and heavy equipment operation including, trucking, forklifts and other material handling equipment.

Prior to joining Exponent, Dr. Arndt was employed by the Wisconsin Center for Space Automation and Robotics, Telerobotics and Human Performance Research Laboratory. His research focus included predicting the abilities of persons with disabilities to perform complex tasks using objective tests and assessing telerobotic technologies for space based applications.

## **Academic Credentials and Professional Honors**

Ph.D., Industrial Engineering, University of Wisconsin-Madison, 1996  
M.S.I.E., Industrial Engineering, University of Wisconsin-Madison, 1991  
B.S., Psychology, University of Wisconsin-Madison, 1988

## **Licenses and Registrations**

Certificant, Board of Certification in Professional Ergonomics, CHFP #1644  
Qualified Forklift Safety Trainer; Qualified Aerial Device Safety Trainer; Certified Forklift Operator; Qualified Individual for Fall Protection; PADI Certified Open Water Scuba Diver

## **Publications**

Cades DM, Arndt SR, Kwasniak AM. Driver distraction is more than just taking eyes off the road. *Institution of Transportation Engineers Journal* 2011; 81(7).

Weaver B, Ruberte L, Khan F, Arndt, S. Normal pedal activation in real world situations. SAE Paper No. 11B-0291/2011-01-0551, SAE World Congress 2011, Detroit, MI, 2011.

Khan FS, Sala JB, Arndt SR. Considerations in the textless presentation of warning and safety information. *Proceedings, 15<sup>th</sup> Annual International Conference on Industrial Engineering Theory, Applications and Practice, Mexico City, Mexico, 2010.*

Khan F, Sala J, Arndt S. Reducing subjectivity when attempting auditory scene recreation in accident reconstruction. *Proceedings, Human Factors and Ergonomics Society 54th Annual Meeting, San Francisco, CA, 2010.*

Vigilante W, Rhoades T, Arndt SR, Cohen HH. Forensic human factors/ergonomics practice from the perspective of the forensic consulting firms. *Proceedings, 53rd Annual Meeting of the Human Factors and Ergonomics Society, San Antonio, TX, 2009.*

Khan FS, Sala JB, Arndt SR. Psychoacoustic response to auditory warnings. *Proceedings, 14th Annual International Conference on Industrial Engineering Theory, Applications and Practice, Anaheim, CA, 2009.*

Khan FS, Arndt SR, Krauss DA. Understanding the relationship between safety climate and warning compliance in occupational settings. *Proceedings, 14th Annual International Conference on Industrial Engineering Theory, Applications and Practice, Anaheim, CA, 2009.*

Arndt S, Krauss D, Weaver B. A previously unidentified failure mode for ladder-climbing fall-protection systems. *Proceedings, American Society of Safety Engineers Professional Development Conference and Exposition, Las Vegas, NV, 2008.*

Krauss D, Arndt S, Lakhiani S, Khan F. Additional considerations when applying the “Safety Engineering Hierarchy” in industrial work settings. *Proceedings, 13th Annual International*

Conference on Industrial Engineering: Theory, Applications and Practice, Las Vegas, NV, 2008.

Arndt S, Young D, Krauss D. Human factors issues in trucking—What does a qualified expert need to know? Trucking Law Seminar, Phoenix, AZ, April 17, 2008.

Arndt SR, Wood CT, Delahunt PB, Wall CT, Krauss DA. Who's in the back seat? A study of driver inattention. Proceedings, 50th Annual Meeting of the Human Factors and Ergonomics Society, Santa Monica, CA, 2006.

Krauss DA, Kuzel MJ, Arndt SR, Delahunt PB. Validation of digital image representations of low-illumination scenes. SAE Paper 2006-01-1288, Society for Automotive Engineers, Inc., 2006.

Huntley-Fenner G, Arndt S, Sanders K. Case study: Pedestrian behavior at grade crossings. Proceedings, Int Conf Indust Engin Theory Applic Practice 2005; 10:69–73.

Arndt SR, Hammoud SA, Cargill RS. Head accelerations experienced during everyday activities and while riding roller coasters. Proceedings, 48th Annual Meeting of the Human Factors and Ergonomics Society, New Orleans, LA, 2004.

Al-Tarawneh IS, Stevens WJ, Arndt SR. An analysis of home and hospital medical device incidents in the MAUDE database. Proceedings, 48th Annual Meeting of the Human Factors and Ergonomics Society, Santa Monica, CA, 2003.

Arndt SR, Al-Tarawneh IS. Fixed-site amusement park injuries: An examination of two sources of data. Proceedings, 47th Annual Meeting of the Human Factors and Ergonomics Society, Santa Monica, CA, 2003.

Arndt SR, Cargill RS. Everyday life accelerations. Injury Insights, Publication of the National Safety Council, p. 6–7, June/July 2003.

Arndt S, Ayres TJ, Li L, Wood CT, Young D. Human factors in product recall planning. Proceedings, 6th Annual International Conference on Industrial Engineering, November 2001.

Arndt SR, Hammoud S, Kennett K. The role of human factors, biomechanics and accident reconstruction in forklift accident investigations. Proceedings, 6th Annual International Conference on Industrial Engineering—Theory, Applications and Practice, San Francisco, CA, November 18–20, 2001.

Wood CT, Arndt S, Kelkar R. Children's use of various internal automobile trunk release mechanisms intended to reduce child entrapment risk. Proceedings, Human Factors and Ergonomics Society Annual Meeting, pp. 912–915, 1999.

Arndt S, Humphrey D, Kelkar R, Kelsh M, McCarthy R, Mrad R. Repetitive stress injuries: incidence trends, the regulatory landscape and verdict. Proceedings, Silicon Valley Ergonomics Conference & Exposition, ErgoCon '99, San Jose, CA, June 1–4, 1999.

Ayres TJ, Wood CT, McCarthy RL, Arndt SR. Relative rollover risk estimates for pickup trucks. Proceedings, 7th International Conference on Product Safety Research, Washington, DC, 1999.

Arndt S, Ayres T, McCarthy R, Schmidt R, Wood CT, Young D. Warning labels and accident data. Proceedings, Human Factors and Ergonomics Society Annual Meeting, pp. 550–553, Chicago, IL, October 1998.

Ayres TJ, Arndt SR, Young DE. Product-related risk of falling among the elderly. Proceedings, Silicon Valley Ergonomics Conference and Exposition, San Jose, CA, 1998.

Wood CT, Arndt SR, McCarthy RL. Using risk analysis to reduce the hazards on playgrounds. Proceedings, National Manufacturing Week Conference, Chicago, IL, March 1998.

Wiker SF, Vanderheiden G, Lee S, Arndt SR. Development of tactile mice for blind access to computers: Importance of stimulation locus, size, and vibrotactile display resolution. Proceedings, Human Factors Society 35<sup>th</sup> Annual Meeting, pp. 708–712, 1991.

### **Reports and Presentations**

Investigation of amusement park and roller coaster injury likelihood and severity. Exponent Failure Analysis Associates Report, prepared for Six Flags, New York, August 2002.

Nanotechnology Products in 2010: What You Need to Know About Warning, Labeling and Instructions. Exponent/Day Pitney Webinar, Presented January 2010.

### **Project Experience**

Evaluation and development of safety and information and collateral materials, including the development of standards, MSDS and on product labeling, with regards to the production, testing and manufacture of nanomaterials.

Tested ladder climbing fall protection systems using Hybrid III test mannequins to examine the performance of systems during simulated fall scenarios. Testing was done to examine the potential limitations of systems that were built in compliance with existing standards.

Evaluated load and vehicle stability of off-road tele-handler forklift in order to determine the potential for loss of load control and vehicle tip-over. Testing was conducted to examine operator's ability to detect load and vehicle instability during the lifting of objects that exceeded the rated capacity of the forklift.

Evaluated roller compactor operator injury likelihood and potential of operator ejection in order to assess the operator controls and seat suspension.

Participated in the design review, testing, evaluation, and implementation of the Fire Department City of New York (FDNY) Personal Safety System (PSS), a compact, lightweight escape system intended for use by firefighters for quick escape from burning buildings. This device was named the best safety invention of 2006 by TIME Magazine.

Assisted manufacturer in the selection and evaluation of various guarding technologies and the development of operation and safety literature and warnings to improve the safety of machinery in the corrugated industry.

Developed improved methodologies for taking and presenting low-light photographs to accurately document the visibility, conspicuity, and contrast of objects and features in the scene.

Tested the readability, comprehensibility, and the accuracy of instructions sent to consumers with product recall retrofit kits.

Evaluated the likelihood of drivers of SUVs to detect unexpected objects in the rear seat during nighttime driving.

Conducted risk analysis of amusement park related safety to examine the accident modes and frequency of injuries associated with riding roller coasters and compared forces experienced on rides with activities of daily living.

Conducted testing to assist automobile manufacture in the design, development, and evaluation of trunk release mechanisms that would allow children and adults to escape from vehicle trunks.

### **Professional Affiliations**

- Human Factors and Ergonomics Society; Chair – Safety Technical Group
- Institute of Industrial Engineers
- American Society of Safety Engineers
- Member of ANSI-Accredited U.S. TAG to ISO/TC 229 *Nanotechnologies*