



# Human Factors in Security

*What's wrong with this quote from a high-level government official after a major security incident?*

"While serious, the incident in question was the result of human error, not a failure of security systems. We have a robust system in place to report and investigate potential violations. In my opinion, this is a circumstance where those systems worked well."

## Human Factors

The term "human factors in security" has been hijacked somewhat from its original meaning. Nowadays, the term is often taken to mean computer modeling of human threats, but the term originally entailed a kind of ergonomics, i.e., understanding human psychology and organizational behavior so as to optimize security.

In the Vulnerability Assessment Team (VAT) at Argonne National Laboratory, we believe "human factors" in the original meaning of the term has been under-studied and insufficiently exploited. Our technical personnel engage in collaborations with industrial/organizational psychologists and other social scientists to try to improve the efficacy of security.



## VAT Human Factors Research Areas

- Security Culture & Security Climate
- Countermeasures to perceptual blindness
- Reducing security guard turnover
- The psychology of seal inspection
- Human factors in nuclear safeguards inspections
- The Insider Threat in nuclear safeguards
- Applying security vulnerability assessment techniques to safety
- Correlations between employee attitudes & the rate of security incidents
- Hosting *the Journal of Physical Security* (technical and social sciences)

## Recent VAT Papers on Human Factors

EG Bitzer, PY Chen, and RG Johnston, "Security in Organizations: Expanding the Frontiers of Industrial-Organizational Psychology", *International Review of Industrial and Organizational Psychology* 24, 131-150 (2009).

EG Bitzer, "An Exploratory Investigation of Organizational Security Climate in a Highly Regulated Environment", Ph.D. Thesis, Colorado State University (2008).

EG Bitzer and A Hoffman, "Psychology in the Study of Physical Security", *J Physical Security* 2, 1-18 (2007).

EG Bitzer, "Strategies for Cutting Turnover", *Security Management* 50, 88-94 (2006).

EG Bitzer and RG Johnston, "Turnkey Turnaround Solutions: Exploiting the Powerful Tools of I/O Psychology", Los Alamos National Laboratory Report LAUR-05-1130, (2005).



RG Johnston, JS Warner, ARE Garcia, et al., "Nuclear Safeguards and Security: We Can Do Better", Paper 1009, *Proceedings of the 10th International Conference on Environmental Remediation and Radioactive Waste Management*, September 4-8, 2005, Glasgow, Scotland.

RG Johnston, "Adversarial Safety Analysis: Borrowing the Methods of Security Vulnerability Assessments", *Journal of Safety Research* 35, 245-248 (2004).

EG Bitzer and RG Johnston, "A Taxonomy for Security Assignments", *J Security Administration* 26, 1-11 (2003).

## VAT Awards

The Argonne Vulnerability Assessment Team has won numerous awards. A partial list includes:

- \* 10 U.S. patents
- \* BECCA Honorary CCO Award for contributions to homeland security, 2009
- \* LANL Fellows Prize for Outstanding Research, 2004
- \* LANL Achievement Awards, 2007, 2004, 1999 & 1995
- \* Distinguished Performance Award from the CIA, 2002
- \* "Excellence in Performance Measure" Award, American Society for Industrial Security, 2002
- \* LANL Distinguished Performance Awards, 2001 & 1996
- \* Excellence in Technology Transfer Awards, 1997 & 1992
- \* R&D 100 National Awards, 1992 & 1994
- \* "Best of What's New Award", Popular Science, 1992

## About Argonne National Laboratory

Argonne National Laboratory, the nation's first national laboratory, is one of the U.S. Department of Energy's largest national laboratories for science and engineering research. Argonne has approximately 3,000 employees, including 1,000 scientists and engineers, three-quarters of whom hold doctoral degrees. Argonne's annual operating budget exceeds \$630 million. Since 1990, Argonne has worked with more than 600 companies, federal agencies, and other organizations.

Currently, 16% of Argonne's budget is for intelligence, defense, and homeland security projects (up from 6% before September 11, 2001). The long-term goal is to significantly increase this percentage.

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