**Steven A. Arndt, Ph.D., P.E.**

24418 Galeano Way

Damascus, Maryland 20872

(240) 305-1110

E-Mail: [steven.arndt.phd.pe@gmail.com](mailto:steven.arndt.phd.pe@gmail.com)

***Objective:*** Make a significant contribution to the nation’s prosperity and defense, in a position of executive technical management, through visionary leadership and scientific excellence.

***Capabilities:***  Internationally recognized expert in the areas of nuclear engineering, reliability engineering, severe accident analysis, and cyber terrorism.Extensive experience leading and managing highly successful, multi-million-dollar, multi-discipline, and multi-national, engineering, development and research projects.Executive leadership experience, with skills in formulating solutions to complex problems.

***Accomplishments:***

* Led a team from three countries and five companies or government agencies in the development of first-of-a-kind reactor simulators for Russia and Ukraine.
* Appointed by Governor of Maryland to State Board for Professional Engineers.
* Served on the Board of Directors for the American Nuclear Society and the Society for Computer Simulation
* Developed software quality standards and initiated the first major analytical study of digital system reliability in the nuclear power arena.
* Developed programs to support research in emerging technical security areas, such as new methods to track radiation sources to reduce the threat of radiological dispersion devices.
* Led the development of NRC research programs for digital instrumentation and control and the development of the new cyber terrorism research program.
* Fellow, American Society for Quality
* Fellow, National Society of Professional Engineers
* Fellow, American Society of Mechanical Engineers
* Fellow, American Nuclear Society
  + The first person ever to hold the Fellow rank in all four societies (ASQ, NSPE, ASME and ANS)
* Fellow, American Association for the Advancement of Science
* Federal Engineer of the Year
  + Frist nuclear engineer to ever win this award
* NSPE Award, the highest award given specifically to a Professional Engineer
* U.S. Representative to numerous international program groups including, the Organization for Economic Co-operation and Development’s (OECD) working group on Advanced Computing for Nuclear Applications, 1992-95 and Chairman of their Digital System Failure analysis program, 2001-2006, and member of the U.S. Delegation to the International Electrotechnical Congress (IEC), 2001 to present.

**Professional Experience**

**Distinguished Scientist**

Advanced Reactor Engineering and Development Section

Nuclear Science and Engineering Directorate

Oak Ridge National Laboratory

March 2021 to Present

Serves as a principle technical leader for advanced reactor system safety and licensing, supporting DOE and other federal agencies, and industrial collaborators, in the areas of reactor safety, system risk and reliability and cyber security.

**Adjunct Professor**

Department of Nuclear Engineering

University of Tennessee

November 2016 to Present

As a Professor in the Nuclear Engineering Department conducts research in the areas of reliability engineering and nuclear engineering, including thermo-hydraulics, nuclear instrumentation and control, software reliability and nuclear energy policy.

**Member and Chairman**

Maryland Board for Professional Engineers

September 2006 to June 2021

As a gubernatorial appointee, served as the Mechanical Engineering member and the Chair of the Maryland Board for Professional Engineers. Duties included reviewing all applications for licensure as a Professional Engineer in Maryland, reviewing and adjudicating all legal actions associated with the practice of engineering in Maryland and developing and approving all regulations governing the practice of engineering.

**Senior Technical Advisor**

Division of Engineering

Office of Nuclear Reactor Regulation

U.S. Nuclear Regulatory Commission

October 2007 to February 2021

Served as the principle technical leader for all instrumentation and control issues within the office of Nuclear Reactor Regulation (NRR) and as such was responsible for assuring regulatory decisions were made based on state-of-the-art technical information and advising senior management and staff on a broad variety of technical safety, policy and international matters related to nuclear instrumentation, software reliability, cyber security and other engineering matters. Supported NRC’s emergency response function, including serving as Director of the Reactor Safety Team.

**Commander**

121st Engineer Regiment

Maryland Defense Force

April 2009 to May 2019

As a Colonel in the Maryland Defense Force, served as the Commander of the 121st Engineer Regiment. The mission of the Defense Force is to provide competent supplemental professional and technical support to the Maryland Military Department and the Maryland National Guard. The 121st Engineer Regiment provides engineering support including emergency damage assessments, non-emergency condition assessments and other requested assistance. As the Regimental Commander, managed all aspects of the organization, including supervision of staff officers, training and development programs and deployments.

**Consultant**

July, 1985 to Present

Performed consulting work for software development and energy industry, as well as, the Advisory Committee on Reactor Safeguards of the NRC, including work such as, assisting in resolving the 1985 Davis-Besse Nuclear Power Station incident for Toledo Edison and evaluation of probabilistic risk assessment work done for and by the NRC. Since 1988, I have primarily worked for, non-profit organizations in the area of technology transfer and evaluation.

**Vice President of Engineering**

Trans Biometric Technologies (TBT)

Medina, Ohio 43220

May 2000 to December 2009

As an officer of this high technology start up, was primarily responsible for the development of new business, in the areas of consulting, consumer electronics, and research, and negotiating teaming relationships with other small and medium sized firms. Additionally, was responsible for all quality functions for the company, including quality management, supplier and customer QA audits and reliability engineering, and all engineering team efforts. TBT is a leader in the integration of biometric technologies, such as fingerprint, voice and face recognition into every day consumer products, particularly in the security market.

**Team Leader and Senior Engineer**

Instrumentation and Electrical Engineering Branch

Office of Nuclear Regulatory Research

U.S. Nuclear Regulatory Commission

January 2001 to September 2007

Led and managed the planning, development and implementation of the NRC’s nuclear instrumentation research program. Developed research programs including coordination with internal and external stakeholders, and served as the project manager for multi-million dollar methods development projects in the areas of software quality assurance and system reliability for nuclear power plant applications. Provided expert advice to policy makers in the areas of digital system safety, including analysis of potential vulnerabilities to cyber terrorism as related to nuclear power applications. In addition, was responsible for the development of new methods and models for the evaluation of emerging technical issues including such projects, as the development of practical digital system and software reliability models, and new methods to track radiation sources to reduce the threat of radiological dispersion devices.

**Senior Engineer and Assistant Branch Chief**

Safety Margins and Systems Analysis Branch

U.S. Nuclear Regulatory Commission

Washington, D.C.

May 1999 to December 2000

My duties included managing the planning, development and implementation of the NRC thermal hydraulics, severe accident, and fuel performance research programs. As Assistant Branch Chief, led the effort to develop the thermal hydraulics, severe accident and source term research programs for the advanced reactor program and managed the branch’s extensive technical portfolio including code development, experimental and analytical research studies and plant analysis. As a Senior Reactor Systems Engineer for severe accident analysis managed the release of new versions of both the SCDAP/RELAP5 and MELCOR reactor analysis codes and conducted research into steam generator performance under severe accident conditions.

**Acting Branch Chief**

Control Instrumentation & Human Factors Branch

U.S. Nuclear Regulatory Commission

Washington, D.C.

April 1998 to May 1999

My duties included managing the planning, development and implementation of the NRC Human Factors and nuclear instrumentation research programs. I was responsible for development of research, including strategic planning, as well as, coordination with the Office of Nuclear Reactor Regulation, Office of Enforcement, and other offices. I Managed the development of regulatory positions on safety culture and operator actions in the human factor area, and EMI/RFI interference in the I&C area. In addition I oversaw the development of software quality standards and initiated the first major analytical study of digital system reliability in the nuclear power arena.

**Technical Advisor**

U. S. Nuclear Regulatory Commission

Chattanooga, TN

July 1990 to March 1998

I served as Chief Academic Officer for the NRC’s internationally recognized professional development program. Responsibilities included the development of faculty (we have a staff of 35 including 22 full time faculty plus contract instructors), development of new curriculum areas (while I was there I completed the overhaul of the risk analysis curriculum and started the certification program) and courses, budget development, and development of teaching performance measures. The professional development program at the NRC includes eleven curriculum areas with more than 100 different courses that range from 8 to 105 contact hours and several certification programs requiring as many as 600 contact hours (40 semester hours). While in this position I founded the video based and computer based training programs for the agency. In addition, I was responsible for a variety of project management duties including leading a team of over forty engineers from three countries and five companies or government agencies in the development of a first-of-a-kind reactor simulator for Russia and Ukraine.

**Assistant Professor**

Naval Systems Engineering Department

United States Naval Academy

Annapolis, Maryland

September 1988 to June 1990

As an Assistant Professor in the Naval Systems Engineering Department, I taught and conducted research in naval systems engineering and nuclear engineering, including thermo-hydraulics, nuclear instrumentation and control and reactor physics.

**Fellow**

Advisory Committee on Reactor Safeguards (ACRS)

U. S. Nuclear Regulatory Commission

Washington, D. C.

January, 1988 to August, 1988

I served as a research fellow assisting the ACRS in the areas of advanced reactors, international incidents, nuclear standards, instrumentation and control, severe accidents, and probabilistic risk assessment (including use of IRRAS and SARA computer codes). I assisted the ACRS in the review of NUREG 1150 and GL 88-20 (IPE), and the early research in to safety culture and plant management. This work involved Congressional hearings, ACRS meetings, Commission meetings, as well as literature review and technical analysis.

**Assistant Professor**

American Technical Institute (ATI)

Brunswick, Tennessee

August, 1987 to December, 1987

As a member of the ATI faculty taught undergraduate courses leading to a B.S. degree in Nuclear Engineering Technology, at the Vogtle Nuclear Power Plant. Courses taught included differential equations, pre-calculus and thermodynamics.

**Research Intern**

Battelle Memorial Institute

Columbus, Ohio

June, 1986 to March, 1987

As a Research Intern, in the Ordnance Systems and Technology Section, conducted classified research into explosive detonation theory and mine neutralization.

**Graduate Associate**

The Ohio State University (OSU)

Columbus, Ohio

June, 1981 to August, 1987

As a Teaching Associate, taught and assisted in teaching graduate and undergraduate courses in measurement systems, control theory, nuclear instrumentation, and nuclear interactions. As a Research Associate, conducted research in the area of neutron sensor response time analysis, including theoretical modeling and experimental measurements. While working on research sponsored by the NRC, Westinghouse, Reuter-Stokes, and GE, was responsible for planning and carrying out research at the OSU research reactor and several commercial nuclear power plants.

**Education**

The Ohio State University

B. S., Engineering Physics

The Ohio State University

M.S., Nuclear Engineering

Research Specialty: Nuclear Instrumentation and Control

The University of Maryland

M.S., Reliability Engineering

Research Specialty: Software Reliability

The Ohio State University

Ph.D., Nuclear Engineering

Research Specialty: Reactor Safety Analysis

**Registrations and Certifications**

Six Sigma Black Belt

Registered Professional Engineer (PE), State of Tennessee

Registered Professional Engineer (PE), State of Maryland

**Selected Honors and Awards**

Eagle Scout, God and Country, and Vigil Honor, Boy Scouts of America

Varsity Letter, Team Captain, The Ohio State University

Texnikoi (TKE) Engineering Honorary

Golden Key Honorary

Sigma Xi Honorary

Institute of Nuclear Power Plant Operations Fellowship

University Fellowship, The Ohio State University

Nuclear Engineering Achievement Award, The Ohio State University

Bertha Lamme Feicht Award

Distinguished Alumnus Award, Ohio State University, College of Engineering

Lamme Medal, Ohio State University, College of Engineering

Nuclear Regulatory Commission (NRC) Certificate of Appreciation (2 Awards)

NRC Time Off Award

NRC Group Award (2 award)

NRC Special Achievement/Act Award (2 awards)

NRC Performance Award (17 awards)

NRC High Quality Award

NRC Engineer of the Year Award (2012)

NRC Meritorious Service Award

NRC Distinguished Service Award

Medal and Citation for Meritorious Y2K service

Senior Member, Institute of Electrical and Electronics Engineers

Fellow, National Society for Professional Engineers (NSPE)

NSPE, Founders Gold Medal (2012)

NSPE Award, NSPE’s highest individual award

Fellow, American Society for Quality (ASQ)

Fellow, American Society of Mechanical Engineers (ASME)

Fellow, American Nuclear Society (ANS)

ANS Presidential Citation

ANS Leadership Award

Fellow, American Association for the Advancement of Science (AAAS)

Fellow, Ohio Academy of Science

NCEES Northeast Zone Distinguished Service Award

Maryland Military Department, Meritorious Service Medal with oak leaf cluster

Appointed by Governor to the Maryland State Board for Professional Engineers

**Professional Associations and Activities**

Maryland State Board of Professional Engineers, 2006-Present

Chairman, 2015 - 2019

Vice Chairman, 2008 - 2015

Special Committee to prepare Continuing Professional Competence regulations, 2010

Committee on Continuing Professional Competence provider certification, 2011- 2016

National Council of Examiners for Engineering and Surveying, 2006-Present

Assistant Vice President, 2013-2015

Zone Leadership Development Committee, 2013-2015 (Chairman, 2013-2015)

Zone Awards Committee, 2013-2014, 2019-2020

Zone Nominating Committee, 2010-2011 (Chairman, 2010-2011)

National Nominating Committee, 2010-2011

National Committee on Examination Audit, 2008-2012

National Special Committee on Bylaws, 2017-2018

National Finance Committee, 2018-2020

Accreditation Board for Engineering and Technology (ABET)

Program Evaluator, Nuclear Engineering programs, 1999-2000

Program Evaluator, Electrical Engineering Technology programs, 1997-2003

Commissioner (NCEES representative), Engineering Technology Accreditation

Commission (ETAC), 2011-2013, 2020-2023

National Society for Professional Engineers, 2007-Present

Committee on Policy and Advocacy, 2016 -2019

Honor and Awards Task Force, 2013-2016

Professional Engineers in Government, Secretary, 2013-2015

Professional Engineers in Government, Chair-Elect, 2015-2016

Professional Engineers in Government, Chair, 2016-2017

Society for Computer Simulation, 1992-2003

Board of Directors, 1993-1994

Associate Vice President, 1994

National Awards Committee, 1994

Chairman of the Simulators Technical Activity Committee, 1993-03

Organizing Committee for the Simulation Muli-Conference, 1992-97

American Nuclear Society, 1981-Present

President, 2022-2023

Vice President, 2021-2022

National Treasurer, 2015-2017

Executive Committee of the Board of Directors, 2015-2017

Board of Directors, 2011-2014, 2015-2017, 2019-2022

Standards Board, 2017-2020 (Chairman, 2017-2020)

National Finance Committee, 2015-2017 (Chairman, 2015-2018)

National Professional Engineering Examination Committee, 2015-2021 (Vice Chair, 2018-2021)

National Governance Sub-Committee, 1995-1997

National Program Committee, 2015-2017

National Planning Committee, 1995-98, 2015-2017 (Chairman, 1997)

National Publication Steering Committee, 1995-2001, 2003-05 (Chairman, 2003-2005)

National Professional Divisions Committee, 2012-2015

National Professional Development Committee, 1996-2000

Special Presidential Committee on Governance Structure, 1998

Special Presidential Committee on Financial Planning, 1998

Special Presidential Committee on Advanced Reactor Policy, 2018-2020

National Nominating Committee, 2003

Human Factors and Instrumentation Division,

Chairman, 2004

Vice Chairman, 2003

Executive Committee Member, 1998-2004

Thermal Hydraulic Division,

Program Committee Member, 2006-Present

Conference Selection Committee Member, 2009-2016

Executive Committee Member, 2010-2013

General Chair, Topical Meeting on Nuclear Plant Instrumentation and Control

and Human-Machine Interface Technologies, 2004

Publications Chair, Topical Meeting on Nuclear Plant Instrumentation and Control

and Human-Machine Interface Technologies, 2013

Organizing Committee, Topical Meeting on Nuclear Plant Instrumentation and

Control and Human-Machine Interface Technologies, 1996, 2000, 2004, 2006, 2009,

2011, 2012, 2015, 2017, 2019, 2021

Co-Chairman, ANS Mid-Western Student Conference, 1984

Track Chair, Reliability and Risk Assessment, ANS Annual Meeting, 2000

Track Chair, Nuclear Plant Systems an Operations, ANS Annual Meeting,

2004

Session Chair, at numerous national, topical, and local meetings, 1982-2017

Washington Local Section

Chair, 2004

Vice Chair, 2003

Awards Committee Chairman, 2002

Executive Committee member, 1999-2005

Institute of Electrical and Electronics Engineers, 1984-Present

Reliability Program for the Development and Production of Electronic Systems

and Equipment (IEEE Std 1332-1998) Standards Committee, 1995-97

American Society for Quality, 1992-Present

National Examining Committee 2013-2015

Member *Software Quality Professional* Journal, Editorial Review Board, 2003 - Present

Chairman of Local Section Education Committee, 1994, 96-98

Awards Committee Chairman, Local Section, 1995

Certification Committee Chairman, Local Section, 2003

Program Committee, Second World Congress on Software Quality, 2000

Program Committee, Forth World Congress on Software Quality, 2007

Fellow Nominating Committee, Local Section, 2010

American Society of Mechanical Engineers, 1986-Present

Member Organizing Committee and Session Chair, International Conference on Nuclear

Engineering, 2001, 2003, 2009, 2010

American Association for the Advancement of Science, 2000-Present

Member, Engineering Section Steering Committee, 2001-2005

IFAC Workshop on Real Time Programming and International Workshop on Software

Engineering, Technical Program Chairman, 2004

IAEA Experts Workshop on Common Cause Failures in Digital Instrumentation and Control

Systems of Nuclear Power Plants, Technical Program Chairman, 2007

U.S. Representative to the Organization for Economic Co-operation and Development’s

(OECD) working group on Advanced Computing for Nuclear Applications, 1992-95

U.S. Representative to the International Electrotechnical Commission, Working Group 45a,

Nuclear Instrumentation, 2001 - Present

Founding Chairman and U.S. Representative to the OECD, Nuclear Energy Agency (NEA), Committee on Computer Systems Important to Safety (COMPSIS), 2001 – 2006

U.S. Representative to the European Task Force on Safety Critical Software, 2008 – 2011

Nuclear Regulatory Commission, Instrumentation and Control Technical Advisory Group, 2008-Present

Nuclear Regulatory Commission Affirmative Action Advisory Committee, 1990-1993 (Chairman,

1992)

Nuclear Regulatory Commission, Technology Advancement Board, 1991-1998

International Dyslexia Society, 1988-Present

Vice President, Tennessee Region, 1996-1997

Chairman, Nominating Committee, East Tennessee Region, 1996

Director, East Tennessee Region, 1994-1998

General Chairman, South Eastern Region Conference, 1997

United States Naval Institute, 1989-2006

Ohio Academy of Science, 1990-Present

Berea City School Board (Ohio), Committee on Graduation Exams, 1975-1977

Proposal reviewer for numerous grants including, the United States Civilian Research

and Development Foundation for the Independent states of the Former Soviet Union, 1996

and 2000 and Department of Energy’s, Nuclear Energy Research Initiative(NERI) grants,

Nuclear Engineering Education Research (NEER) grants, Small Business Innovative

Research (SBIR) grants and Nuclear Energy Plant Optimization (NEPO) grants 1998-2003.

Journal reviewer, 1988 - Present

Nuclear Technology, Nuclear Science and Engineering, Reliability Engineering and System

Safety, Software Quality Professional, Transaction on Software, Transaction on Reliability,

etc.

**Publications**

Book Chapters

1) C.S., Smidts, and **S.A. Arndt**, “Nuclear Power Plant Control Systems”, *Encyclopedia of Computer Science and Engineering*, edited by Benjamin Wah, Wiley, New York, New York, 2006.

2) **S.A.** **Arndt**, "Simulation and Simulators - Their Role in Science and Society", *Encyclopedia of Microcomputers*, Marcel Dekker, Inc., New York, New York, 1994.

Journal Articles

1) Y Shi, M. Li, **S.A. Arndt** and C. Smidts, “Metric-based Software Reliability Prediction Approach and its Application,” *Empirical Software Engineering,* Vol 22,Issue 4, pp 1579-1633, 2017

2) **S.A.** **Arndt,** and A. Kurizky, “Lessons Learned from the Nuclear Regulatory Commission's Digital System Risk Research,” *Nuclear Technology,* Vol 173, No. 1, pp 2-7, January 2011

3) T. Aldemir, S. Guarro, D. Mandelli, J. Kirshenbaum, L. A. Mangan, P. Bucci, M. Yau, E. Ekici, D.W. Miller, X. Sun, and **S.A. Arndt**, “Probabilistic Risk Assessment Modeling of Digital Instrumentation and Control Systems Using Two Dynamic Methodologies,” *Reliability Engineering and System Safety,* Vol 95, pp 1011-1039, October 2010

4) J. Kirschenbaum, P. Bucci, M. Stovsky, D. Mandelli, T. Aldemir, and **S. A. Arndt**, “A Benchmark System for Comparing Reliability Modeling Approaches for Digital Instrumentation and Control Systems,” *Nuclear Technology,* Vol 165, No. 1, pp 53-95, January 2009.

5) T. Aldemir, D.W, Miller, M. Stovsky, J. Kirschenbaum, P. Bucci, L.A. Mangan, A. Fentiman and **S.A. Arndt**, “Methodologies for the Probabilistic Risk Assessment of Digital Reactor Protection and Control Systems,” *Nuclear Technology,* Vol. 159, No. 2, pp 167-191, August, 2007.

6) T. Aldemir, **S. A. Arndt** and D. W. Miller, "Simulation of the Transient Response of Ionization Chambers to Bias Voltage Perturbations", *Nuclear Technology*, Vol. 76, No. 2, pp 248-259, February, 1987.

7) J.W. Talnagi, D. W. Miller and **S. A. Arndt**, "An Assessment of Neutron Sensor Channel In-Situ Performance Testing Methods", *IEEE Transactions on Nuclear Science*, Vol. 32, No. 1, pp 1025-1029, February, 1985.

8) D.W. Miller, J. W. Talnagi, **S. A. Arndt**, G. S. Rowe and A. Behbahani, "The Application of Radiation Detection Noise as an In-Situ Method of Surveillance and Performance Verification of Nuclear Instrumentation on Reactor Protection Systems", *Progress in Nuclear Energy*, Vol. 15, pp 165-173, October, 1984.

9) D.W. Miller, J. W. Talnagi, **S. A. Arndt** and A. Behbahani, "Analysis of Random Neutron Sensor Fluctuation for Surveillance of Nuclear Instrumentation Channels in Nuclear Power Plant Protection Systems", *IEEE Transactions on Nuclear Science*, Vol. 31, No. 1, pp 711-716, February, 1984.

10) J.W. Talnagi, **S. A. Arndt**, A. Behbahani and D. W. Miller, "The High Voltage Perturbation Techniques for Test In-Situ Response of Neutron Sensors of the Type Used in Nuclear Power Plant Protection Systems", *IEEE Transactions on Nuclear Science*, Vol 31, No. 1, pp 717-720, February, 1984.

11) D.W. Miller, J. W. Talnagi, **S. A. Arndt** and A. Behbahani, "Analysis of Random Neutron Sensor Fluctuations for Surveillance of Nuclear Instrumentation Channels in Nuclear Power Plant Protection Systems", *Progress in Nuclear Energy*, Vol. 12, 1983.

Conference Papers

1) **S.A. Arndt** and S.N. Hammonds, “Asset Management Using Digital Engineering for the Versatile Test Reactor,” *Transaction of the American Nuclear Society*, Washington, D.C., November 2021

2) **S.A. Arndt**, “Design Readiness and Maturity Assessment (DRAMA) tool for Advanced Reactors,” *Proceedings of the International Congress on Advanced Nuclear Power Plants (ICAPP)*, Abu Dhabi, October 2021

3) **S.A. Arndt**, “Use of IEC and Other Alternative Standards in NRC Reviews,” *Proceedings of the 11th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, February 2019

4) Sofia Guerra, **Steven Arndt**, Janos Eiler, Ron Jarrett, Horst Miedl, Andrew Nack,

and Paolo Picca, “Justification of Commercial Industrial Instrumentation and Control Equipment for Nuclear Power Plant Applications,” *Proceedings of the 11th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, February 2019

5) R. Alvarado and **S.A. Arndt**, “Modernizing Approaches to Common Cause Failure in Digital Instrumentation and Control Systems,” *Proceedings of the 11th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* February 2019

6) M. Li, N. Carte, **S.A. Arndt** and M. Waters, “Risk Informed Licensing Applications for Nuclear Power Plants – An Example Application for I&C Systems,” *Proceedings of the Reliability and Maintainability Symposium (RAMS*), January 2019

7) **S.A. Arndt**, R. Alvarado, B. Dittman, Kenneth Mott and R.T. Wood, “NRC Technical Basis for Evaluation of Its Position on Protection Against Common Cause Failure in Digital Systems Used in Nuclear Power Plants,” *Proceedings of the 10th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, June 2017

8) **S.A. Arndt**, R. Alvarado, B. Dittman and M. Waterman, “Development of Criteria for Hardware Descripted Language Programmed-Devices for Safety Systems in Nuclear Power Plants in the U.S.,” *Transaction of the American Nuclear Society*, New Orleans, LA, June 2016

9) **S.A. Arndt**, “Technical Guidance for the Review of Field Programmable Gate Arrays in the Nuclear Power Industry,” *Proceedings of the 9th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* February 2015

10) J. Thorp, K. Sturzebecher, S. Darbali and **S.A. Arndt**, “Coordination and Interface of Cyber Security and Digital Instrumentation and Control System Reviews,” *Proceedings of the 9th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* February 2015

11) N. Carte and **S.A. Arndt**, “Justifying Acceptable Alternatives to the Digital I&C Regulatory Guides and Standards,” *Proceedings of the 9th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* February 2015

12) **S.A. Arndt**, “Digital System Testability in the Context of Diversity,” *Transactions of the American Nuclear Society,* Reno, NV, June, 2014

13) **S.A. Arndt**, “Standard for Field Programmable Gate Arrays in the Nuclear Power Industry,” *Transactions of the American Nuclear Society,* Atlanta, Georgia, June, 2013

14) **S.A. Arndt**, “A New Method for Quantification of Risk Perception,” *Transactions of the American Nuclear Society,* San Diego, CA, November, 2012

15) T. Mossman and **S.A. Arndt**, “Lesions Learned from the Implementation of Regulatory Guide 1.152, Revision 3 and Needs for Future Work,” *Proceedings of the 8th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* July 2012

16) **S.A. Arndt,** P. Dacruz, O. Glockler, Joseph Naser, Thuy Nguyen and P. Salaun, “Current Issues Associated with the Implementation of FPGAs in the Nuclear Power Industry,” *Proceedings of the 8th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* July 2012

17) **S.A. Arndt**, “Digital System Categorization Methodology to Support Integration of Digital Instrumentation and Control Models in PRAs,” *Proceedings of the International Symposium on Future I&C for Nuclear Power Plants,* Daejeon, Korea, August, 2011

18) J. Grobe and **S.A. Arndt**, “Regulatory Aspects of Digital Systems Retrofits at

U.S. Operating Nuclear Power Plants,” *Proceedings of the International Congress on Advances in Nuclear Power Plants (ICAPP 2011)*, Nice, France, May, 2011.

19) **S.A. Arndt,** “Digital Instrumentation and Control Systems Upgrades in Current Generation Nuclear Power Plants,” *Proceedings of the 17th International Conference on Nuclear Engineering (ICONE18)*, Xi’an, China, May, 2010.

20) **S.A. Arndt,** “A Simple Method for Assessing Risk from Multiple Reactors on a Site,” *Transactions of the American Nuclear Society*, November 2009.

21) **S.A. Arndt,** and R. Denning, “Potential Ways to Modify the NRC Safety Goal Policy,” *Proceedings of the 17th International Conference on Nuclear Engineering (ICONE17)*, July, 2009.

22) T. Aldemir, S. Guarro, **S.A. Arndt**, et. al., ”Dynamic Reliability Modeling of Digital Instrumentation and Conrol Systems in Nuclear Power Plants,” *Transactions of the American Nuclear Society,* June 2009.

23) **S.A.** **Arndt** and A. Kuritzky, “Lessons Learned from the NRC Digital System Risk Research,” *Proceedings of the 6th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* April 2009.

24) T. Aldemir, S. Guarro, **S.A. Arndt**, et. al., ”Dynamic Reliability Modeling of Digital Instrumentation and Conrol Systems in Nuclear Power Plants,” *Proceedings of the 6th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* April 2009.

25) **S.A.** **Arndt,** “Key Issues and Lessons Learned Associated with the Licensing of U.S. Digital Instrumentation and Control System Upgrades,” *Proceedings of the IAEA Technical Meeting on the Impact of Digital Instrumentation and Control Technologies on the Operation and Licensing of Nuclear Power Plants*, November, 2008.

26) **S.A. Arndt,** C. Doutt and G Kelly, “Development of Guidance for the Review of New Reactor Digital Instrumentation and Control Probabilistic Risk Assessments,” *Proceedings of the American Nuclear Society International Topical Meeting on Probabilities Safety Assessment and Analysis (PSA’08)*, September 2008.

27) D.W. Miller, **S.A. Arndt** and E.L. Quinn, et.al., “Instrumentation and Control and Human Machine Interface Science and Technology Roadmap in Support of Advanced Reactors and Fuel Programs in the U.S.,” *Proceedings of the 16th International Congress on Advances in Nuclear Power Plants (ICAPP ’08)*, June 2008

28) D.W. Miller, S.A. Arndt and E.L. Quinn, et.al., “Roadmap for Research, Development, and Demonstration of Instrumentation, Controls, and Human-Machine Interface Technologies”, *Proceedings of the 16th International Conference on Nuclear Engineering (ICONE 16),* May 2008

29) **S.A.** **Arndt,** “Digital I&C System Categorization Method for Use in Informing Nuclear Power Plant Failure Data Analysis and Risk Analysis,” *Proceeding of the Ninth International Probabilistic Safety Assessment and Management Conference*, Hong Kong, China, May 2008

30) J. Kirschenbaum, D. Mandelli, P. Bucci, M. Stovsky, E. Ekici, T. Aldemir, X. Sun, D. W. Miller, **S. A. Arndt**, "A Benchmark System for the Reliability Modeling of Digital Instrumentation and Control Systems," *Proceeding of the Ninth International Probabilistic Safety Assessment and Management Conference*, Hong Kong, China, May 2008  
  
31) D. Mandelli, J. Kirschenbaum, L. A. Mangan, P. Bucci, M. Stovsky, E. Ekici, T. Aldemir, X. Sun, **S. A. Arndt**, “Markov/CCMT Modelling of the Benchmark System and Incorporation of the Results Into an Existing PRA,” *Proceeding of the Ninth International Probabilistic Safety Assessment and Management Conference*, Hong Kong, China, May 2008

32) D.W. Miller, M. Reisi-Fard, X. Sun, T.E., Blue and **S.A. Arndt**, ”A Review of Gamma Thermometer Applications in Nuclear Reactors,” *Proceedings of the International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-12)*, October, 2007

33) **S.A. Arndt**, “Categorization System for Use in Reliability Modeling of Digital Systems”, *Proceedings of the IAEA Common Cause Failures in Digital Instrumentation and Control Systems of Nuclear Power Plants*, June 2007.

34) **S.A. Arndt**, “Numerical Study of the Jet Impingement Flow Due to a Steam Generator Tube Leak”, *Transactions of the American Nuclear Society*, Vol. 96, pp 67-71, June 2007.

35) **S.A.** **Arndt**, “Integrating Software Reliability Concepts into Risk and Reliability Modeling of Digital Instrumentation and Control Systems used in Nuclear Power,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

36) **S.A. Arndt**, “Development of Regulatory Guidance for Risk-Informing Digital System Reviews,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

37) R.E. Edwards, R.A. Shaffer and **S.A. Arndt**, “Modeling Digital Control Systems in TRACE,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

38) D.W. Miller, **S.A. Arndt**, L. Bond, D. Dudenhoffer, D. Holcomb, J. O’Hara, J. Naser, E. Quinn and R. Wood, “Instrumentation, Control and Human Machine Research and Development Plan in Support of Advanced Reactor and Fuel Programs in the U.S.,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

39) J.W. Hines, D. Garvey, J. Garvey, R. Seibert, and **S. Arndt**, “Technical Assessment of On-Line Monitoring Techniques for Performance Assessment in Nuclear Power Plants,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

40) J.W. Hines, **S.A. Arndt** and D.W. Miller, “Analysis of Newly Proposed Setpoint Methods,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

41) L.T. Mangan, P. Bucci, T. Aldemir and **S.A. Arndt**, “Incorporation of Markov Reliability Models for Digital Instrumentation and Control Systems into Existing PRAs,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

42) J.D. Kirschenbaum, M. Mandelli, P. Stovsky, W. Bucci, T. Aldemir, D.W. Miller and **S.A. Arndt**, “A Benchmark System for the Assessment of Reliability Modeling Methodologies for Digital Instrumentation and Control Systems in Nuclear Plants,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

43) A. Orosz, D. W. Miller, R. N. Christensen and **S.A. Arndt**, “Uncertainty Analysis of Ultrasonic Flowmeters,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

44) R. Christensen, D.W. Miller, S. Lai, R. Winningham and **S.A. Arndt**, “FLUENT Modeling of Ultrasonic Flow Meters in Feedwater Flow Profiles Associated with Two Out of Plane 90 Degree Bends,” *Proceedings of the 5th ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

45) **S.A.** **Arndt**, “Software Quality Assurance for Analysis and Design Software Used in the Nuclear Industry“, *Transactions of the American Nuclear Society*, June 2006.

46) J.W. Himes, D. Garvey, R. Seibert, and **S.A. Arndt**, “Evaluation of Uncertainty Analysis Techniques for On-Line Sensor Calibration Monitoring and systems Diagnosis“, *Transactions of the American Nuclear Society*, November 2005.

47) T. Aldemir, **S.A. Arndt**, D.W. Miller and A.W. Fentiman, ”Integration of Reliability Models for Nuclear Power Plant Digital Instrumentation and Control Systems into Probabilistic Risk Assessment Studies”, *Proceedings of American Nuclear Society Topical Meeting on Probabilistic Safety Assessment,* September 2005.

48) J. Kirschenbaum, M. Stovsky, P. Bucci, **S.A. Arndt**, and T. Aldemir, ”Benchmark Development for Comparing Digital Instrumentation and Control System Reliability Modeling Approaches”, *Proceedings of American Nuclear Society Topical Meeting on Probabilistic Safety Assessment,* September 2005.

49) J.W. Himes, D. Garvey, R. Seibert, and **S.A. Arndt**, “On-Line Sensor Calibration Monitoring Challenges and Effective Monte-Carlo Based Uncertainty Estimation”, *Proceedings of the IAEA Technical Meeting on On-Line Condition Monitoring of Equipment and Processes in Nuclear Power Plants Using Advanced Diagnostic Systems*, June 2005.

50) T. Aldemir, D.W. Miller, A.W. Fentiman and **S.A., Arndt**, “Updating Plant Probabilistic Risk Assessment Studies for Digital Instrumentation and Control Systems“, *Transactions of the American Nuclear Society*, June 2005.

51) T. Aldemir, and **S.A. Arndt**, “Digital Control Systems Reliability – Issues Related to the Modeling of Process Dynamics”, *Transactions of the American Nuclear Society*, June 2005.

52) J. Kirschenbaum, M. Stovsky, P. Bucci, T. Aldemir and **S.A. Arndt**, “A Survey of Reliability Modeling Methodologies for Digital Instrumentation and Control Systems“, *Transactions of the American Nuclear Society*, June 2005.

53) **S.A. Arndt**, C.S. Smidts, and M. Li, “Validation of a Methodology for Quantitatively Assessing Software Quality”, *Proceedings of the American Nuclear Society Topical Meeting on Operating Nuclear Facility Safety*, 2004.

54) R.T. Wood, and **S.A. Arndt**, “Experience with Digital I&C Technology in Evolutionary Plants“, *Transactions of the American Nuclear Society*, November 2003.

55) R.T. Wood, **S.A. Arndt** and C.E. Antonescu, “Emerging Technologies in Digital Systems for Use in Nuclear Power Plants”, *Transactions of the American Nuclear Society*, November 2003.

56) **S.A.** **Arndt,** C.E. Antonescu, R.A. Shaffer, T. Govan and R.T. Wood, “Emerging Technologies in Instrumentation and Control,” *Proceedings of the Nuclear Regulatory Commission’s Nuclear Safety Research Conference,* October, 2003.

57) **S.A. Arndt,** “Regulatory Framework for the Next Generation of U.S. Nuclear Reactors”, *Transactions of the American Nuclear Society*, November 2002.

58) **S.A.** **Arndt,** E. A. Thornsbury, and N. O. Siu, “What PRA Needs From A Digital Systems Analysis” *Proceedings of Probabilistic Safety Assessment and Management Meeting,* 2002.

59) **S.A.** **Arndt** and R.A. Shaffer, “Cyber Security and Software Quality Assurance in the Nuclear Industry”, *Proceedings of the 47th ASQ Toronto Quality Forum*, October 2002.

60) **S.A.** **Arndt**, “NRC Research Plan for Digital I&C” *Proceeding of the ANS Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* 2000.

61) **S.A. Arndt**, “Analysis of Requirements for the Next Generation of Two Phase Thermal-Hydraulic Codes for Application to Reactor Analysis,” *Proceedings of the CSNI Workshop on Transient Thermal-Hydraulic and Neutronic Codes Requirements,* 1996

62) L.E. Phillips, **S. A. Arndt**, J. March-Leuba, "Use of Training Simulator in the Regulatory Evaluation of Mitigative Actions to Resolve ATWS/Stability Issues" *Proceedings of the 4th International Topical Meeting on Nuclear Thermal Hydraulics, Operations and Safety,* April 1994.

63) K.A. Raglin, **S. A. Arndt**, J. I. Griffin, J. P. Griffin, L. J. Reidinger and S. K. Showe, “Experience Gained for the RETACT/STK Upgrade of the Black Fox Simulator”, *Proceedings of the Simulation MuliConference on Simulators International X*, April, 1993.

64) **S.A.** **Arndt,** K. Barmnses and J. P. Griffin, “The Use of PICCSO in the Development of a Nuclear Engineering Workstation Simulator”, *Proceedings of the Simulation MuliConference on Simulators International X*, April, 1993.

65) **S.A.** **Arndt** and K. Barmnses, “The Use of PICCSO in the Development of a Classroom Simulation Application“, *Proceedings of the Enlarged Halden Program Meeting,* March,1993.

66) **S.A.** **Arndt**, "An Evaluation of the Capability of the Real-time Advanced Core and Thermal-Hydraulic (REACT) Code to Simulate LaSalle type Flow Instability in Boiling Water Reactors", *Proceedings of the Simulation MultiConference on Simulators International IX*, April, 1992.

67) **S.A.** **Arndt** and D. G. Marksberry, "Development of the Reactor Safety Assessment System for Use By the U. S. Nuclear Regulatory Commission", *Proceedings of the Simulation MultiConference on Simulators International IX*, April, 1992.

68) **S.A.** **Arndt** and D. W. Miller, "The Use of Radiation Detection Noise for Signal Validation and Sensor Degradation Monitoring", *Proceedings of the 6th Symposium on Nuclear Reactor Surveillance and Diagnostics (SMORN),* May, 1991.

69) T. Aldemir, **S. A. Arndt** and D. W. Miller, "Transient Analysis of Ionization Chambers to Quantify Sensor Degradation", *Transactions of the American Nuclear Society,* Vol. 52, November, 1986.

70) J.W. Talnagi, **S. A. Arndt** and D. W. Miller, "On-Line Surveillance Methods for Neutron Sensors", *Proceedings of the 6th Power Plant Dynamics, Control and Testing Symposium,* April, 1986.

Examples of the numerous reports and other publications that I have authored or co-authored:

1) E.J. Benner and **S. A. Arndt**, “How the NRC Modernized Its Digital I&C Infrastructure and Where it Goes from Here,” *Nuclear News*, Vol. 64, No 7, pp 34-41, June, 2021

2) *Challenges and Approaches for Selecting, Assessing and Qualifying Commercial Industrial Digital Instrumentation and Control Equipment for Use in Nuclear Power Plant Applications*, by **S. Arndt**, J. Eiler, R. Jarrett, H. Miedl, S. Guerra, M.S. Nemier, A. Nack, K.Y. Sohn and K. Mckay, IAEA NUCLEAR ENERGY SERIES No. NR-T-3.31, Vienna, September, 2020 (ISBN: 978–92–0–105019-9)

3) *Dependability Assessment of Software for Safety Instrumentation and Control Systems at Nuclear Power Plants*, by **S. Arndt**, T. Bartha, R. Bloomfield, J. Eiler, K.C. Kwon, M. Lawford, A. Lindner, T. Nguyen, S. Seaman, B. Shumaker, C. Smidts, R. Tate, R.T. Wood and M. Zahid, IAEA NUCLEAR ENERGY SERIES No. D-NP-T-3.27, Vienna, July, 2018 (ISBN:978–92–0–101218–0)

4) **S.A. Arndt** and S. Birla, “U.S. Nuclear Regulatory Commission’s Plan to Modernize Digital Instrumentation and Control regulatory Infrastructure,” *Nuclear News*, June, 2017

5) *Application of Field Programmable Gate Arrays in Instrumentation and Control Systems of NPPs*, by A. Andrashov, S. Arndt, J. Eiler, J. Gassino, O. Glockler, Z. Hai, J. Naser, S. Russomanno, S. Seaman and N.Thuy, IAEA NUCLEAR ENERGY SERIES No. D-NP-T-3.17, Vienna, January, 2016 (ISBN:978-92-0-103515-8)

6) **S.A. Arndt**, “Regulatory Oversight of Nuclear Power Plant Digital Technology Use: An Update,” *Nuclear News*, February, 2015

7) Grobe, J.A. and **S.A. Arndt**, “Regulatory Oversight of the Use of Digital Technology in Nuclear Power Plants,” *Nuclear News*, March 2009

8) *A Benchmark Implementation of Two Dynamic Methodologies for the Reliability Modeling of Digital Instrumentation and Control Systems*, by T. Aldemir, **S. Arndt**, et. al., NUREG/CR-6985, February, 2009

9) *Dynamic Reliability Modeling of Digital Instrumentation and Control Systems for Nuclear Reactor Probabilistic Risk Assessments,* by T. Aldemir, **S. Arndt**, et. al, NUREG/CR-6942, September 2007

10) *Technology Roadmap on Instrumentation, Control, and Human-Machine Interface to Support DOE Advance Nuclear Energy Programs, INL/EXT-06-11862,* by D.D. Dudenhoeffer, D.E. Holcomb, **S.A. Arndt**, et. al., March 2007

11) *Advanced Reactor Licensing: Experience with Digital I&C Technology in Evolutionary Plants,* by R.T Wood, **S.A. Arndt**, et. al., NUREG/CR-6842, April, 2004

12) *Radiological Dispersal Devices: An Initial Study to Identify Radioactive Materials of Greatest Concern and Approaches to Their Tracking, Tagging and Disposition. A Report to the Nuclear Regulatory Commission and the Secretary of Energy*, Prepared by the DOE/NRC Interagency Working Group on Radiological Dispersal Devices (**S.A. Arndt** Tagging Subgroup Leader), May, 2003

13) *Emerging Technology in Instrumentation and Controls*, by R.T. Wood, C.E Antonescu, **S.A. Arndt**, et. al., NUREG/CR-6812, January, 2003

14) *Guidance for Professional Development of NRC Staff in Regulatory Risk Analysis*, By **S. A. Arndt**, et. al., NUREG/BR-0228, July, 1996

15) *Guidance for Professional Development of NRC Staff in Digital Instrumentation and Control*, By **S.A. Arndt**, et. al., NUREG/BR-0229, September, 1996