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

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**Objective:** Make a significant contribution to the nation's prosperity and defense, through visionary leadership and scientific excellence in the field of nuclear engineering.

**Capabilities:** Internationally recognized expert in the areas of nuclear engineering, reliability engineering, severe accident analysis, and cyber terrorism. Extensive experience in developing new methods for implementation of risk-inform and performance-based regulation of both light water and non-light water advanced reactors. 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 as the 68<sup>th</sup> President of the American Nuclear Society, the leading professional society for nuclear science and technology professionals
- NRC Distinguished Service Award in 2017 for exemplary contributions to nuclear safety
- Part of the team that developed the NRC PRA Policy Statement and the first PRA implementation plan
- 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
- 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, 2012
  - 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, UN Climate Change Conference (COP-27), 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. Leads several research projects developing new methods to solve engineering and safety issues associated with the readiness of advanced reactors to enter the licensing process and tradeoffs between innovation and the ability to be licensed. Developed methods to use advanced tool, such as digital twins to support integrated reactor systems analysis and performance. Supported the development of new analysis methods and standards for advanced materials and manufacturing technologies.

#### President

American Nuclear Society June 2022 to June 2023

Served as the President and Chairman of the Board for the largest international not-for-profit organization of scientists, engineers, and industry professionals in the field of nuclear engineering and related disciplines. ANS is composed of more than 10,000 members from more than 40 countries. As President, led all the activities of the 18 divisions, 15 standing committees and the professional staff of the society, including managing national and topical meetings, publishing journals, proceedings and transactions, as well as books and technical standards. Also led the societies interactions with Congress, the Executive Branch agencies and international organizations like the IAEA and OECD/NEA.

## Adjunct Professor

Department of Nuclear Engineering University of Tennessee September 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. Teaches courses on nuclear regulation and nuclear energy policy.

### Member and Chairman

Maryland Board for Professional Engineers September 2006 to June 2021

Appointed by both Democratic and Republican Governors and confirmed by the State Senate, 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 a principle technical leader within the office of Nuclear Reactor Regulation (NRR) with responsibilities 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. Led technical efforts related to risk-informing NRC technical reviews, updating regulation to support non-light water advanced reactor licensing and other engineering matters. Led the identification and prioritization of the Post-Fukushima safety enhancements, updates to the NRC position on digital upgrades and developed training for NRC staff members on how to risk-inform their work. Led NRC support to other nations nuclear regulatory agencies including India and Ukraine. Supported NRC's emergency response function, including staffing the operation center during the Fukushima event and later serving as Director of the Reactor Safety Team.

### Commander

121<sup>st</sup> Engineer Regiment Maryland Defense Force April 2009 to May 2019

As a Colonel in the Maryland Defense Force, served as the Commander of the 121<sup>st</sup> 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 121<sup>st</sup> 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.

## **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

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

Duties included managing the planning, development and implementation of the NRC Human Factors and nuclear instrumentation research programs. Responsible for development of research, including strategic planning, coordination with the Office of Nuclear Reactor Regulation, Office of Enforcement, and other offices. 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, 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

Served as Chief Academic Officer for the NRC's internationally recognized professional development program. Responsibilities included the development of faculty (staff of 35 including 22 full time faculty plus contract instructors), development of new curriculum areas (overhaul of the risk analysis curriculum and initiated 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. Founded the video based and computer-based training programs for the agency. 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, 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

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). Assisted the ACRS in the review of NUREG 1150 and GL 88-20 (IPE), and the early research into 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

Taught undergraduate courses leading to a B.S. degree in Nuclear Engineering Technology, at the Vogtle 1 and 2 Nuclear Power Plant. Courses taught included differential equations, precalculus 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**

Appointed by Governor to the Maryland State Board for Professional Engineers Maryland Military Department, Meritorious Service Medal with oak leaf cluster Fellow, National Society for Professional Engineers (NSPE) NSPE, Federal Engineer of the Year (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 (2 awards) ANS Leadership Award ANS Don Miller Award Fellow, American Association for the Advancement of Science (AAAS) Fellow, Ohio Academy of Science Senior Member, Institute of Electrical and Electronics Engineers NCEES Northeast Zone Distinguished Service Award Distinguished Alumnus Award, Ohio State University, College of Engineering Lamme Medal, Ohio State University, College of Engineering Nuclear Engineering Achievement Award, The Ohio State University Bertha Lamme Feicht Award

NRC Distinguished Service Award NRC Meritorious Service Award Medal and Citation for Meritorious Y2K service NRC Engineer of the Year Award (2012) NRC Certificate of Appreciation (2 Awards) NRC Group Award (2 awards) NRC Special Achievement/Act Award (2 awards) NRC Performance Award (17 awards) NRC High Quality Award 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 Eagle Scout, God and Country, and Vigil Honor, Boy Scouts of America

### **Professional Associations and Activities**

#### Maryland State Board of Professional Engineers, 2006-2021

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

Emerging Technology Committee, 2023-2024 Committee on Policy and Advocacy, 2016-2019 Honor and Awards Task Force, 2013-2016, 2020-2023 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

Immediate Past President, 2023-2024 President. 2022-2023 Vice President, 2021-2022 National Treasurer, 2015-2017 Executive Committee of the Board of Directors, 2015-2017, 2021-2024 Board of Directors, 2011-2014, 2015-2017, 2019-2024 Standards Board, 2017-2020 (Chairman, 2017-2020) NSTOR Advisory Board (2023-2024) National Finance Committee, 2015-2017 (Chairman, 2015-2018) National Professional Engineering Examination Committee, 2015-2024 (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 Certification, 2023 - 2024 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, 2023 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 Honorary Chair, International Congress on Advances in Nuclear Power Plants (ICAPP), 2023 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, 2023

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, 1982-2023 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 - 2020 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

#### U.S. Representative to the International Atomic Energy Agency

Experts Workshop on Common Cause Failures in Digital Instrumentation and Control Systems of Nuclear Power Plants, Technical Program Chairman, 2007 Expert working group on "Challenges and Approaches for Selecting, Assessing and Qualifying Commercial Industrial Digital Instrumentation and Control Equipment for Use in Nuclear Power Plant Applications"

Expert working group on "Dependability Assessment of Software for Safety Instrumentation and Control Systems at Nuclear Power Plants"

# U.S. Representative to the Organization for Economic Co-operation and Development's working group on Advanced Computing for Nuclear Applications, 1992-95

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

#### U.S. Representative to the International Electrotechnical Commission, Working Group 45a, Nuclear Instrumentation, 2001 – Present

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

#### 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

**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) G.E. Hauck and **S.A. Arndt**, "Using an Energy Justice Framework to Improve Regulatory Policy," *Transaction of the American Nuclear Society*, Las Vegas, NV, June 2024

2) A.J. Huning, S.A. Arndt and J.A. Christensen, "An Introduction to Microreactor Licensing

Basis Events," Transaction of the American Nuclear Society, Indianapolis, IN, June 2023

3) **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

4) **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

5) **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

6) 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

7) 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

8) 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

9) **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 10<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, June 2017

10) **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

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

12) 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 9<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, February 2015

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

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

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

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

17) 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 8<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, July 2012

18) **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 8<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies, July 2012* 

19) **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

20) 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.

21) **S.A. Arndt**, "Digital Instrumentation and Control Systems Upgrades in Current Generation Nuclear Power Plants," *Proceedings of the 17<sup>th</sup> International Conference on Nuclear Engineering (ICONE18)*, Xi'an, China, May, 2010.

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

23) **S.A. Arndt**, and R. Denning, "Potential Ways to Modify the NRC Safety Goal Policy," *Proceedings of the 17<sup>th</sup> International Conference on Nuclear Engineering (ICONE17)*, July, 2009.

24) 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.

25) S.A. Arndt and A. Kuritzky, "Lessons Learned from the NRC Digital System Risk

Research," *Proceedings of the 6<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies, April 2009.* 

26) 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 6<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies*, April 2009.

27) **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.

28) **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.

29) 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 16<sup>th</sup> International Congress on Advances in Nuclear Power Plants (ICAPP '08)*, June 2008

30) 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 16<sup>th</sup> International Conference on Nuclear Engineering (ICONE 16),* May 2008

31) **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

32) 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

33) 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

34) 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

35) 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.

36) **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.

37) **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 5<sup>th</sup> ANS International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies,* November 2006.

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