



## PERSONAL DETAILS

### HASHEM M. HASHEMIAN ("HASH")

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**Phone:** 865-691-1756  
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**Address:** AMS 9119 Cross Park Drive  
Knoxville, Tennessee 37923, USA  
**Citizenship:** USA  
**Specialty:** Nuclear Power Plant Instrumentation

## ACADEMIC BACKGROUND

1977 ~ Present

Doctor of Philosophy (PhD), Nuclear Engineering  
Chalmers University of Technology, Sweden  
Doctor of Philosophy (PhD), Computer Engineering  
Western University, Ontario, Canada  
Doctor of Engineering (DEng), Electrical Engineering  
Lamar University, Texas, USA  
Master of Science, Nuclear Engineering  
University of Tennessee, Knoxville, USA

## WORK HISTORY

1985 ~ Present

**President and Chief Executive Officer (CEO)**  
**Analysis and Measurement Services Corporation**  
[www.ams-corp.com](http://www.ams-corp.com)

### ABOUT AMS

Analysis and Measurement Services Corporation (AMS) is a nuclear engineering consulting firm headquartered in the United States with representatives in Austria, China, France, South Korea, Spain, and the United Kingdom. AMS provides specialized equipment, training, and testing services to nearly all the nuclear power plants in the United States and many worldwide. In addition, AMS collaborates with a number of national and international organizations such as the U.S. Department of Energy (DOE), Electric Power Research Institute (EPRI), International Society of Automation (ISA), International Atomic Energy Agency (IAEA), and the International Electrotechnical Commission (IEC).

Headquartered in Knoxville, Tennessee, on a four-facility campus spanning more than 100,000 square feet of office, laboratory, and expansion space, AMS is a leading supplier of equipment, training, and services for in-situ response time testing and on-line calibration monitoring of temperature and pressure instrumentation in nuclear power plants. AMS also provides automated equipment for performance testing of a variety of electrical and mechanical components and systems in nuclear power plants and has performed high technology research and development projects for DOE, NRC, U.S. Department of Defense, NASA, U.S. Navy, U.S. Airforce, utilities, manufacturers, and vendors.





## **PROFESSIONAL AFFILIATIONS** *1990 ~ Present*

Fellow, American Nuclear Society (ANS)  
Fellow, Institute of Electrical and Electronics Engineers (IEEE)  
Fellow, International Society of Automation (ISA)  
Member, European Nuclear Society (ENS)  
Member, Tau Beta Pi Engineering Honor Society  
Member, International Nuclear Energy Academy (INEA)

## **APPOINTMENTS**

By Tennessee Governor to Tennessee Nuclear Energy Advisory Council (TNEAC) (2023-Present)  
By Tennessee Lieutenant Governor to Board of Directors of Launch Tennessee (2019-Present)  
By Tennessee Governor to State Energy Policy Council (2018-Present)  
By U.S. Secretary of Commerce to Civil Nuclear Trade Advisory Committee (2016-2025)  
By Dean of College of Engineering as Member Emeritus on Engineering Advisory Board, University of Tennessee (2014-Present)  
By Chairman of Electrical Engineering and Computer Science Department to Industrial Advisory Board of the Department, University of Tennessee (2012-2015)  
By Dean of College of Engineering to Dean's Advisory Board, Lamar University, Texas (2010-Present)

## **SELECTED MEDIA**

Anything is Possible - Hash Hashemian, part 1 (September 25, 2016)  
Anything is Possible - Hash Hashemian, part 2 (October 3, 2016)  
Part 1 with Hash Hashemian of Analysis and Measurement Services (AMS) Corporation (July 25, 2022)  
Part 2 with Hash Hashemian of Analysis and Measurement Services (AMS) Corporation (August 8, 2022)  
Hash Hashemian-The Real American Dream Podcast (September 27, 2022)  
The Importance of Tennessee in Creating a World of Green Energy with Dr. Hash Hashemian (November 22, 2023)  
The Power Hour, A Conversation with Incoming American Nuclear Society President, Dr. Hash Hashemian (July 8, 2025)  
Atomic Show #335 – Dr. Hash Hashemian, President American Nuclear Society (July 12, 2025)



## **PATENTS**

### **Awarded**

- [1] "Apparatus for Measuring the Degradation of a Sensor Time Constant." Patent No. US 4,295,128 (October 1981).
- [2] "Nuclear Reactor Rod Drop Time Testing Method." Patent No. US 6,404,835 B1 (June 2002).
- [3] "Integrated System for Verifying the Performance and Health of Instruments and Processes." Patent No. US 6,915,237 B2 (July 2005).
- [4] "Instrument and Process Performance and Reliability Verification System." Patent No. US 6,973,413 B2 (December 2005).
- [5] "Testing of Wire Systems and End Devices Installed in Industrial Processes." Patent No. US 7,254,520 B2 (August 2007).
- [6] "Cross-Calibration of Plant Instruments with Computer Data." Patent No. US 7,295,944 B2 (November 2007).
- [7] "Predictive Maintenance and Management of Aging of Installed Cables." Patent No. US 7,319,939 B2 (January 2008).
- [8] "Condition Monitoring of Electrical Cables as Installed in Industrial Processes." Patent No. US 7,478,010 B2 (January 2009).
- [9] "In-Service Calibration of Temperature Measurement Devices Using Plant Monitoring System Data." Patent No. US 7,739,067 B2 (June 2010).
- [10] "Advanced Digital Control Rod Position Indication System with Rod Drop Monitoring for Nuclear Power Plants." Patent No. US 8,351,561 B2 (January 2013).
- [11] "Diverse and Redundant Resistance Temperature Detector." Patent No. US 8,840,301 B2 (September 2014).
- [12] "Control Rod Position Indication Systems and Methods for Nuclear Power Plants." Patent No. US 8,824,617 B2 (September 2014).
- [13] "Pitot Tube Diagnostic Systems and Methods." Patent No. US 8,924,184 B2 (December 2014).
- [14] "High Resolution Digital Rod Position Indication System for Nuclear Power Plants." Patent No. US 8,903,033 B2 (December 2014).
- [15] "Systems and Methods of Monitoring Control Rods of a Nuclear Power Plant." Patent No. US 9,431,137 B2 (August 2016).
- [16] "Automated System for On-Line Monitoring and Diagnostics of Rod Position Indication Coils for Nuclear Power Plants." Patent No. US 9,697,916 (July 2017).
- [17] "Systems and Methods of Measuring Temperature in Industrial Environments." Patent No. US 9,797,787 B2 (October 2017).
- [18] "In-Situ Determination of Rod Control System Coil and Cable Impedances for Nuclear Power Plants." Patent No. 10,395,781 (August 2019).
- [19] "Non-Intrusive Error Detection Techniques for Control and Shutdown Rod Position in Nuclear Reactors." Patent No. 10,446,2778 B2 (October 2019).
- [20] "Systems and Methods of Monitoring Control Rods of Nuclear Power Plants." Patent No. 11,031,143 B2 (June 2021).
- [21] "Systems and Methods to Establish Time Interval Between Calibrations of Process Sensors." Patent No. 12,181,360 (December 2024).

### **Pending**

- [1] "Systems and Methods of Monitoring Operation of Control Rod Mechanisms of Nuclear Power Plants." Patent Application No. US 2019/0362860 A1 (November 2019).



## HONORS & AWARDS

- 2022 **American Nuclear Society Presidential Citation**
- 2017 **Inducted into the University of Tennessee Department of Nuclear Engineering Hall of Fame (inaugural year)**
- 2016 **Knoxville Chamber of Commerce Pinnacle Innovator Award**
- 2016 **University of Tennessee College of Engineering Nathan W. Dougherty Award**
- 2016 **East Tennessee Junior Achievement Business Hall of Fame Inductee**
- 2016 U.S. Chamber of Commerce **Blue Ribbon Small Business Award**
- 2015 American Nuclear Society **Robert L. Long Training Excellence Award**
- 2015 U.S. Chamber of Commerce **Blue Ribbon Small Business Award**
- 2014 U.S. Chamber of Commerce **Blue Ribbon Small Business Award**
- 2014 Award for organization and service to "Systems: Women in Electrical Engineering and Computer Science at the University of Tennessee"
- 2013 U.S. Small Business Administration's **Small Business Person of the Year Award** for the State of Tennessee
- 2013 U.S. Chamber of Commerce **Blue Ribbon Small Business Award**
- 2012 **University of Tennessee Alumni Professional Achievement Award**
- 2012 U.S. Chamber of Commerce **Blue Ribbon Small Business Award**
- 2011 **U.S. Small Business Administration Tibbetts' Award** for unique contributions as a model of excellence for the Small Business Innovation Research (SBIR) program
- 2011 Invitee to a **White House reception in recognition of excellence in R&D work on government-funded projects**
- 2011 U.S. Chamber of Commerce **Free Enterprise Award**
- 2010 **Knoxville Chamber of Commerce Pinnacle Award** in recognition of outstanding business practices and community support
- 2009 **Business Tennessee Hot 100 Award**
- 2006 **IEC Award** for writing standards on safety of nuclear power plants
- 2001 **State of Tennessee Governor's Manufacturing Excellence Award**



**PUBLICATION  
REVIEW SERVICES**

*Nuclear Technology Journal of ANS*  
*IEEE Transactions on Nuclear Science*  
*IEEE Transactions on Instrumentation & Measurement*  
*ISA Transactions*  
*Annals of Nuclear Energy Journal by Elsevier*  
*Automation in Construction Journal by Elsevier*  
*International Journal of Electrical Power & Energy Systems Journal by Elsevier*  
*International Journal of Nuclear Energy Science and Technology by Inderscience*  
*ASME Journal of Dynamic Systems–Measurement and Control*  
*ASME Journal of Heat Transfer*  
*Japan's Journal of Nuclear Science and Technology*  
*Measurement Science and Technology Journal by IOP Publishing*  
*Mechanical Systems and Signal Processing Journal by Elsevier*  
*Nuclear Engineering and Design Journal by Elsevier*  
*Nuclear Engineering and Technology Journal by Elsevier*  
*Nuclear Engineering and Technology Journal (NET) by Korean Nuclear Society*  
*Nuclear Instruments and Methods in Physics Research by Elsevier*  
*Progress in Nuclear Energy Journal by Elsevier*  
*Recent Patents on Signal Processing Journal by Bentham Science*  
*Water Research Journal by Elsevier*

**ACADEMIC  
SERVICES**

Adjunct Professor of Practice at the Woodruff School of Mechanical Engineering at Georgia Institute of Technology

Adjunct Professor of Nuclear Engineering at the University of Tennessee–Knoxville

Guest lecturer, Electrical Engineering and Computer Science Department of the University of Tennessee–Knoxville

Distinguished Seminar Series Speaker, University of Tennessee's Department of Mechanical, Aerospace, and Biomedical Engineering (2014)

Technical Reviewer of government proposals for research contracts or grants to universities and national laboratories (2005–present)

Member, the U.S. Department of Energy's steering committee evaluating results of large R&D grants to major U.S. companies

Member, committees advising the U.S. Department of Energy on development of road maps for R&D funding for I&C research in support of U.S. nuclear facilities



## **SAMPLES OF JOURNAL ARTICLES**

"Implementation of New Cable Condition-Monitoring Technology at Oyster Creek Nuclear Generating Station," *Nuclear Technology*, Vol. 200, No. 2, (2017).

"Nuclear Power Plant Instrumentation and Control Cable Prognostics Using Indenter Modulus Measurements," *International Journal of Prognostics and Health Management*, Vol. 5 (December 2014).

"Frequency Domain Reflectometry for Remaining Useful Life Estimation of Instrumentation and Control Cables," *Journal of Risk and Reliability* (August 2014).

"Remaining Useful Life Estimation of Electric Cables in Nuclear Power Plants," *Chemical Engineering Transactions*, Vol. 33 (September 2013).

"Response Time Testing of Temperature Sensors Using Loop Current Step Response Method," *Int. J. Nuclear Energy Science and Technology*, Vol. 7, No. 3 (February 2013).

"An Integrated Health Monitoring System for Fission Surface Reactors," *SciVerse ScienceDirect, Space, Propulsion & Energy Sciences International Forum—2012, Physics Procedia*, Vol. 38 (November 2012).

"Wireless Sensor Applications in Nuclear Power Plants," *Nuclear Technology*, Vol. 173, No. 1 (January 2011).

"State-of-the-Art Predictive Maintenance Techniques," *IEEE Transactions on Instrumentation and Measurement*, Vol. 60, No. 10 (October 2011).

"Sensors for Next-Generation Nuclear Plants: Fiber-Optic and Wireless," *Nuclear Science and Engineering*, 169 (2011).

"On-Line Monitoring Applications in Nuclear Power Plants," *Progress in Nuclear Energy*, Vol. 53, No. 2 (March 2011).

## **SAMPLES OF MAGAZINE ARTICLES**

"Breakthrough Development in Aging Management of I&C Cables," Volume 66, Number 8, *Nuclear News*, pp. 34-39 (July 2023).

"Online Monitoring Technology To Extend Calibration Intervals of Nuclear Plant Pressure Transmitters," *Nuclear News*, pp. 44-50 (June 2021).

"Plant Condition Monitoring," *Nuclear Plant Journal* (July-August 2019).

"I&C Commissioning of AP1000 Reactors in China," *Nuclear Plant Journal* (May-June 2019).

"Wireless Data Communication in NPP," *Nuclear Plant Journal* (March-April 2019).

"Big Data Application to I&C," *Nuclear Plant Journal* (March-April 2019).

"Cable Aging Management," *Nuclear Plant Journal* (March-April 2019).

"Performance Monitoring of Digital I&C Systems," *Nuclear Plant Journal* (January-February 2019).

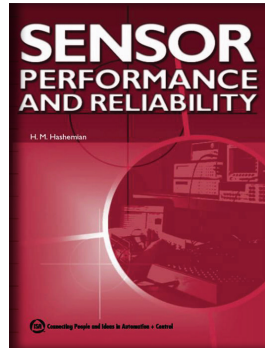
"I&C System Sensors for Advanced Nuclear Reactor," *Nuclear Plant Journal* (July-August 2018).

"Cable Aging Management in Nuclear Power Plants," *Nuclear Plant Journal* (February 2018).

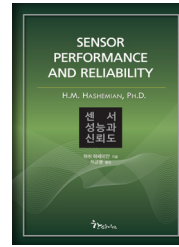
**PUBLISHED BOOKS**

**Sensor Performance and Reliability**

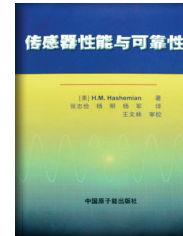
International Society of Automation (ISA), 2005—*Published in four languages*



Russian Edition



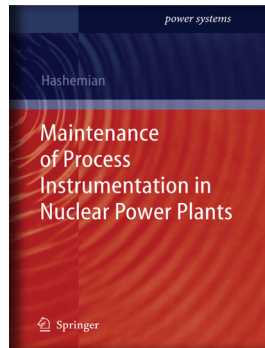
Korean Edition



Chinese Edition

**Maintenance of Process Instrumentation in Nuclear Power Plants**

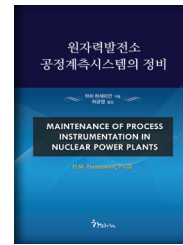
Springer-Verlag, 2006—*Published in five languages*



Russian Edition



Japanese Edition



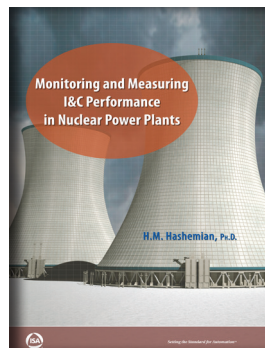
Korean Edition



Chinese Edition

**Monitoring and Measuring I&C Performance in Nuclear Power Plants**

International Society of Automation (ISA), 2014





**PUBLISHED  
BOOK CHAPTERS**

"Electric Cables and Coatings," Chapter 6 in *Materials' Ageing and Degradation in Light Water Reactors*, edited by Dr. K. L. Murty, Cambridge, UK: Woodhead Publishing Series in Energy No. 44 (2013).

"Nuclear Power Plant Instrumentation and Control," Chapter 3 in *Nuclear Power—Control, Reliability and Human Factors*, (Nuclear Power / Book 4), InTech European Open Access Publisher (2011).

"Nuclear Plant Instrumentation and Control System Performance Monitoring," *Instrument Engineers' Handbook: Process Software and Digital Networks*, Vol. 3, Fourth Edition/Chapter 61 (2011).

"Development and Application of Instrumentation and Control Components in Nuclear Power Plants," Chapter 16 in *Understanding and Mitigating Ageing in Nuclear Power Plants: Materials and Operational Aspects of Plant Life Management (PLiM)*, edited by Dr. Philip G. Tipping. Cambridge, UK: Woodhead Publishing Ltd., CRC Press (2010).

"Cross-Correlation Flow Metering," Chapter 2.5 in *Instrument Engineers' Handbook, Fourth Edition, "Process Measurement and Analysis."* CRC Press (2003).

"Response Time and Drift Testing," Chapter 1.9 in *Instrument Engineers' Handbook, Fourth Edition, "Process Measurement and Analysis."* CRC Press (2003).

"Instrument Calibration," Chapter 1.8 in *Instrument Engineers' Handbook, Fourth Edition, "Process Measurement and Analysis."* CRC Press (2003).

"Safety Instrumentation and Justification of Its Cost," Chapter 2.11 in *Instrument Engineers' Handbook, Third Edition, "Process Software and Digital Networks."* CRC Press (2002).

"Optimized Maintenance and Management of Aging of Critical Equipment in Nuclear Power Plants," Chapter 3 in *Power Plant Surveillance and Diagnostics, Applied Research with Artificial Intelligence. Berlin, Germany: Springer-Verlag* (2002).



## SERVICES TO THE AMERICAN NUCLEAR SOCIETY

### **ANS ACTIVITIES**

President of ANS (2025-2026)

Vice President/President Elect (2024-2025)

Chair of Honors and Awards Committee of ANS (2019–Present)

Member, Honors and Awards Committee of ANS (2015–Present)

Vice Chair, Development Committee of ANS (2021-2023)

Member, Scholarship Policy & Coordination Committee of ANS (2020–Present)

General Chairman, ANS's 9th International Topical Meeting on Nuclear Power Plant Instrumentation, Control and Human–Machine Interface Technologies (NPIC & HMIT 2015), Charlotte, NC (February 2015)

Chairman (2013–2014) and Member (2014–2015) of Nominating Committee for the Human Factors, Instrumentation & Controls Division (HFICD) of ANS

Chairman, Human Factors, Instrumentation & Controls Division (HFICD) of ANS (2012–2013)

Member of Technical Program Committee, ANS's 8th International Topical Meeting on Nuclear Power Plant Instrumentation, Control and Human–Machine Interface Technologies (NPIC & HMIT 2012), San Diego, CA (July 2012)

Technical Program Co-Chair, ANS's 7th International Topical Meeting on Nuclear Power Plant Instrumentation, Control and Human–Machine Interface Technologies (NPIC & HMIT 2010), Las Vegas, NV (November 2010)

### **ANS PUBLICATIONS**

“Condition-Based Calibration of Pressure Transmitters Implemented at Vogtle Nuclear Station”, proceedings of the 2024 ANS Annual Conference (June 16-19, 2024).

“Topical Report for Condition-Based Calibration Assessment of Pressure Transmitters in Nuclear Power Plants,” proceedings of the 2021 ANS Winter Meeting (November 30–December 3, 2021).

“Topical Report on Implementation of Online Monitoring to Extend Calibration Intervals of Pressure Transmitters,” proceedings of the American Nuclear Society 12th International Topical Meeting on NPIC & HMIT, (June 2021).

“Pressure Sensing Line Blockage and Degradation in Nuclear Power Plants,” proceedings of the American Nuclear Society Annual Meeting, (November 2019).

“Resolving the Regulatory Issues with Implementation of Online Monitoring Technologies to Extend Calibration Intervals of Process Instruments in Nuclear Power Plants,” proceedings of the American Nuclear Society 11th International Topical Meeting on NPIC & HMIT, (February 2019).

“Management of Aging of Reactor Internal Components,” proceedings of the American Nuclear Society Annual Meeting, June 2018.



**ANS PUBLICATIONS (cont.)**

"Research Gap in Management of Insulation Aging of Medium Voltage Cables in Nuclear Power Plants," American Nuclear Society Annual Meeting, (June 2018).

"Avoiding Unnecessary Cable Replacement in Nuclear Power Plants," American Nuclear Society Annual Meeting, (June 2018).

"Management of Aging of Reactor Internal Components," American Nuclear Society Annual Meeting, (June 2018).

"Research Gap in Management of Insulation Aging of Medium Voltage Cables in Nuclear Power Plants," American Nuclear Society Annual Meeting, (June 2018).

"Online Monitoring of Rod Control Systems in Combustion Engineering Pressurized Water Reactors," proceedings of the American Nuclear Society 10th International Topical Meeting on NPIC & HMIT, (June 2017).

"On-Line Monitoring of I&C Transmitters and Sensors for Calibration Verification and Response Time Testing Was Successfully Implemented at ATR," proceedings of the American Nuclear Society 10th International Topical Meeting on NPIC & HMIT, (June 2017).

"Emerging and Existing Sensing Technologies for Small Modular Reactors and Advanced Reactors," proceedings of the American Nuclear Society 10th International Topical Meeting on NPIC & HMIT (June 2017).

"Comparison of Prognostic Techniques for Estimating the Remaining Useful Life of Nuclear Plant Components," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).

"Dynamic Modeling of a Small Modular Reactor for Control and Monitoring," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).

"Implementation of On-Line Monitoring to Optimize I&C Maintenance: A Case Study," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).

"Development and Application of Loose Parts and Acoustical Structural Monitoring During Plant Startup Following Steam Generator Replacement," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).

"Quantitative Methods for Reliability and Fault Tolerance of Digital Instrumentation and Control Systems," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).

"First Principles Model of a Simulation Flow Loop in Support of On-Line Monitoring Implementation in Next Generation Nuclear Power Plants," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).

"Uncertainty Quantification Methods for Robust Online Monitoring and Recalibration Interval Extension," proceedings of the American Nuclear Society 9th International Topical Meeting on NPIC & HMIT, (February 2015).



## **INTERNATIONAL ACTIVITIES**

### **INTERNATIONAL ATOMIC ENERGY AGENCY—IAEA**

Over the past 30 years, Dr. Hashemian has been invited by the IAEA to serve as chairman of four coordinated research projects (CRPs) of the IAEA. He has also served as a member or chairman of a number of IAEA committees, writing reports, and guidelines for equipment condition monitoring, aging management, and predictive maintenance for the global nuclear power industry. Some examples of his IAEA work are listed below.

“On-line Monitoring of Instrumentation in Research Reactors,” IAEA Coordinated Research Project (CRP) (December 2017).

“Benchmark Analysis for Condition Monitoring Test Techniques of Aged Low Voltage Cables in Nuclear Power Plants,” IAEA Coordinated Research Project (CRP) (October 2017).

“Condition Monitoring and Management of Ageing of Low Voltage Cables in Nuclear Power Plants.” IAEA Coordinated Research Project (CRP) (October 2015).

“Improved Instrumentation & Control Maintenance Techniques for Research Reactors using a Plant Computer.” IAEA Coordinated Research Project (CRP) (May 2015).

“Advanced Surveillance, Diagnostic and Prognostic Techniques in Monitoring Structures, Systems and Components in Nuclear Power Plants.” IAEA Nuclear Energy Series No. NP-T-3.14 (September 2013).

“Improved Instrumentation and Control Maintenance Techniques for Research Reactors.” IAEA Coordinated Research Project (CRP) (2012–2014).

“Qualification, Condition Monitoring, and Management of Aging of Low Voltage Cables in Nuclear Power Plant Life Management.” IAEA Coordinated Research Project (CRP) (2012–2014).

“On-Line Monitoring for Improving Performance of Nuclear Power Plants Parts 1 and 2: Instrumentation Channel Monitoring.” IAEA Nuclear Energy Series No. NP-T-1.1 and NP-T-1.2 (September 2008).

“On-Line Monitoring for Improving Performance of Nuclear Power Plants Part 2: Process and Component Condition Monitoring and Diagnostics.” IAEA Nuclear Energy Series No. NP-T-1.2 (September 2008).

### **INTERNATIONAL ELECTROTECHNICAL COMMISSION—IEC**

Dr. Hashemian served as project leader and main author of the following standards and has been a member of the U.S. National Committee of IEC since 2005.

IEC 62465, “Management of Aging of Electrical Cabling Systems.” International Electrotechnical Commission (2010).

IEC 62342, “Management of Aging.” International Electrotechnical Commission (August 2007).

IEC 62385, “Methods for Assessing the Performance of Safety System Instrument Channels.” International Electrotechnical Commission (June 2007).

In addition, in 2019 Dr. Hashemian started working to develop two new IEC standards on criteria for performance characteristics of critical equipment in nuclear facilities.