



HFICD

A Division of the
American Nuclear Society



**HUMAN FACTORS, INSTRUMENTATION & CONTROLS
DIVISION OF THE AMERICAN NUCLEAR SOCIETY**

WINTER 2015 NEWSLETTER

<http://hfcd.ans.org>

HF, I&C SESSIONS AT THE ANS WINTER MEETING



HFICD is sponsoring three sessions at the upcoming ANS Winter Meeting (November 8-12 at the Marriott Wardman Park Hotel in Washington DC). Below is a short description of each of these sessions (please see the final meeting program for specific room information for these sessions). We hope you'll join us in November!

HFICD General Session (Wednesday, November 11, 1:00-4:00; organized by Sean M Smith, Lockheed Martin, and chaired by Sacit M. Cetiner, Oak Ridge National Laboratory): The seven papers in this session (with authors from domestic and international universities, research laboratories, industry, and a regulatory body) cover upgrading various nuclear power plant control systems and the use of simulation test beds for evaluation of control systems.

Operator Interactions and Control Room Support Systems (Wednesday, November 11, 4:30 - 7:00; organized by Sean M. Smith, Lockheed Martin, and chaired by

Joseph A. Naser, Electric Power Research Institute): The four papers in this session (with authors from universities in Korea and China) focus on operator actions, including methods to evaluate competencies and methods to reduce operator error.

Nuclear Power Plant Condition Monitoring (Thursday, November 12, 8:00 – 12:00; organized by Sean M. Smith, Lockheed Martin, and chaired by Jamie Baalis Coble, University of Tennessee): The seven papers in this session (with authors from domestic and international universities and industry) focus on prognostic and diagnostic monitoring of various plant systems, and include both modeling and hardware methodologies.

If you have an idea for a session and/or would like to organize a session at a future meeting, please contact Kathy McCarthy (kathryn.mccarthy@inl.gov).

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THOUGHTS FROM THE CHAIR

—Sean Smith



Greetings to the members of the division. Division leadership is busy preparing for the 2015 ANS Winter Meeting to be held in Washington, DC. We have a lot of things going on and this is a great opportunity to share a few thoughts and a few bits of information with such a wide audience.

The 2016 division officers and executive committee members assumed their roles at the end of the 2015 ANS Annual Meeting in San Antonio. I would like to offer my thanks to immediate past chair John Mahoney for leading the executive committee and the division from 2014 to 2015. I would also like to thank the other exiting officers and committee members for carrying out the work needed to keep the division organized and aligned with its mission. Volunteers are the lifeblood of the division: It is my hope that each of you will consider becoming part of the executive committee or contributing to one or more of the committee's projects. See any current or past officer for more information about how to get involved. Contact information for the nomination committee is available on the division website (hficd.ans.org).

Over the past year, under John Mahoney's leadership, the executive committee has prepared the division's strategic plan for the next five years (2016-2020). The four mission components addressed by the HFICD strategic plan are *Professional Development*, *Sharing Information and Advancements in Technology*, *Growing HFICD Membership*, and *Engaging the Public and Policy Makers*.

The 9th International Conference on Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies (NPIC-HMIT) took place in February of

this year in Charlotte, North Carolina, and was one of the most successful meetings to date. It was attended by over 440 participants from 26 countries, with more than 350 papers submitted and more than 60 technical sessions. The 10th annual NPIC-HMIT Conference will be an embedded topical during the 2017 ANS Annual Meeting in San Francisco, California. Be on the lookout for the Call for Papers. As part of the division's effort to increase the dissemination of utility experience to the HFIC community, a presentation-only path is now available for utility presenters to share experiences and key lessons learned.

In this newsletter you will find a tribute to the late Dr. Don Miller, who passed away in August. Dr. Miller was an internationally recognized expert in the advancement of nuclear power plant instrumentation and control systems, a dedicated educator, a past president and Fellow of the ANS, and the namesake and first recipient of our division's Don Miller Award. There are many who will mourn his passing and celebrate his life and its many contributions to the lives of others.

In closing, the HFICD is a great place to connect with peers, mentors, and protégés, and to make lifelong friends. Our community of human factors and I&C professionals plays a critical role in sustaining the excellent safety record and high performance of the world's nuclear fleets, and in upgrading and expanding those fleets to meet the world's needs. The HFIC division is here to support and encourage its members in that critical role.

Thank you for your membership and support of the division. Have a successful year!

Best regards,
Sean Smith, P.E.
HFICD 2015-2016 Chair

2015 DON MILLER AWARD WINNERS

HFICD has honored two distinguished members of the human factors and instrumentation and control community with the Don Miller Award in 2015. Dr. John O'Hara was recognized for his outstanding contributions to the field of human factors and human/system integration, and Mr. Gary Johnson for his work in safety-related digital I&C for the international nuclear power industry.



Dr. John O'Hara is a Senior Scientist at Brookhaven National Laboratory and a Certified Human Factors Professional. As principal investigator of many research programs in human/systems integration, he has studied the effects of technology on

crew performance and system safety. The results of this research are used in the human factors aspects of complex systems such as power plants, spacecraft, homeland security systems, and merchant ships. Two notable publications are the Human Factors Engineering Program Review Model (NUREG-0711) and the Human-System Interface Design Review Guidelines (NUREG-0700), which form the technical basis of the NRC's HFE reviews. He has conducted major design reviews of the human factors aspects of advanced systems, including nuclear power plant control rooms and NASA test facility control rooms. He has been the principal support reviewer to the NRC for the HFE of all the design certification reviews. His human factors methods, tools, and guidance have been incorporated into for government and private organizations standards by organizations such as ISO, IEC, and IEEE. His nominator said of him, "John O'Hara is an outstanding human being, a real gentleman, a great scientist, friend, and contributor to ANS and HFICD...He is humble, hardworking, and very polite and pleasant. He is gentle and kind and treats people with extraordinary grace and respect. In the HMI area, I can not think of anyone else at this time who deserves the Don Miller award more than John O'Hara."

Mr. Gary Johnson is a distinguished expert on safety-related digital I&C for the nuclear power industry. Specifically, he has long been a leader in the development of safety practices and guidance for the application of digital technology in NPPs. During



his time at Lawrence Livermore National Laboratory, Gary led and contributed technically to several NRC-sponsored regulatory support activities, which led to the incorporation of review guidance on digital safety systems into NUREG-0800 Chapter 7 (I&C Systems) in 1997, the revision of key elements of Chapter 7 in 2007, the development of improved treatment of I&C in standard technical specifications for operating nuclear power plants, and the review of I&C systems as part of ALWR design certification. Drawing from his extensive regulatory and nuclear industry experience, Gary also developed and conducted training on I&C safety review practices for regulatory authorities from Ukraine, the Russian Federation, Czech Republic, Taiwan, South Korea, and Hungary. Gary's internationally-recognized leadership as a subject matter expert arises from his roles as a key technical resource for NRC, international standards committee chairman, and IAEA safety officer. During his time as Senior Safety Officer for IAEA, Gary led the effort to revise the Agency's safety guide on design of I&C systems. As evidenced by his extraordinary accomplishments related to safety and regulatory guidance for I&C systems, Gary has significantly contributed to the safe, effective application of digital technology for nuclear power.

2015 HFICD STUDENT BEST PAPER AWARD WINNER SPOTLIGHT



Pattern Recognition: An On-line Monitoring Technique for Sensor Health in Nuclear Power Plants - Charlie Hanson, University of Pittsburgh

A prominent challenge for making small modular reactor technology viable is the need to limit staffing and surveillance needs as the number of units in the overall power plant increases. To address this issue, pattern recognition and machine learning were used to detect faults in sensor data via on-line monitoring. Implementations of on-line sensor monitoring in the nuclear industry are currently based on sensor calibration verification. However, there is no explicit classification of specific sensor anomalies that could indicate sensor or equipment degradation associated with these currently implemented strategies. Class-discriminative models can be used to identify specific faults by training a model to recognize the pertinent features that characterize specific faults. By asserting the bounds of a specific fault behavior a priori, sensor faults can be randomly generated within these defined boundaries and a class-discriminative supervised learning algorithm can be developed using this domain knowledge.

In this work, this type of sensor-fault identification was performed at a basic level; a single process variable signal (or the process variable signals associated with a physically-redundant signal bank) was examined for various faults. A simplified point kinetics model of a nuclear reactor was used to generate signals for fault detection — namely, the hot-leg temperature of this reactor was the variable of interest. Three types of known sensor faults were introduced into the model in real time: saturation, sensor bias, and impulsive

noise. Regularized logistic regression was the statistical binary classification technique used in this work. Training and optimization for this classifier architecture was performed off-line, but the classifier itself was used in real-time. Implementation of this array of class discriminative “fault observers” was achieved in a real-time simulation environment to demonstrate classifier technique and performance.

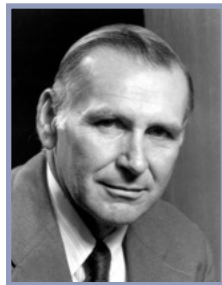
As a result of the definition of the classification technique, the output returned by each “fault observer” was a conditional probability describing its belief that a particular fault occurred at a given instance or interval in time. Aside from the benefit of being able to express a binary outcome with a degree of belief to human operators, this quantified evidence of sensor faults can be aggregated in a database for evaluation by a higher-level probabilistic inference engine for determining the onset of equipment degradation. This classification system was proven to be additionally effective in that it not only identified that a certain process signal output was deviating from its expected value, but it also identified the type of fault associated with this deviation – adding a level of intelligence to the fault detection.

HFICD has a new website! The address hasn't changed, but the look and layout have. Please visit <http://hficd.ans.org> to take it for a spin. If you see something that you like (or something that you don't), let us know through the *Contact Us* link.

OPPORTUNITIES FOR STUDENTS

Robert E. Uhrig Graduate Scholarship

HFICD provides the Robert E. Uhrig Scholarship for students pursuing graduate studies in nuclear engineering with a focus in the field of human factors, instrumentation and controls. An applicant for this scholarship must be a full-time graduate student of a North American university engaged in Masters or Ph.D. research into technical aspects of human factors, instrumentation and/or controls. Students of all nationalities are eligible for the Robert E. Uhrig Graduate Scholarship. The Robert E. Uhrig Graduate Scholarship is a \$4,000 scholarship given annually to one graduate student in nuclear engineering. The Scholarship focus is on the technical disciplines involved in Nuclear Plant Instrumentation, Controls, and Human-Machine Interface Technologies in the context of nuclear power or other nuclear engineering specific applications. Applications for the Robert E. Uhrig Graduate Scholarship must include a personal essay describing the student's research and career interests in fields relevant to Human Factors and/or Instrumentation and Control. Scholarship applications are due February 1, 2016. For more information, please visit <http://www.ans.org/honors/scholarships/>.



Dr. R. E. Uhrig

HFICD Best Paper Award at the ANS Student Conference

HFICD will provide a \$500 cash prize to the winner of the HFICD Best Paper Award at the 2016 ANS Student Conference at the University of Wisconsin-Madison. Students are encouraged to submit original research papers relevant to the fields of Human Factors and/or Instrumentation and Control in order to be eligible for the award.



2015 HFICD Best Paper Award Winner Charles Hansen



HUMAN FACTORS ENGINEERING FOCUS: THE HUMAN FACTORS OF CONTROL ROOM MODERNIZATION

Dr. Ronald Boring, Idaho National Laboratory

License extensions for commercial nuclear power plants are a reality, and crucial systems that were nearing the end of life must now be replaced or modernized. Helping plants meet the needs of life extension is the key focus of the U.S. Department of Energy's (DOE) Light Water Reactor Sustainability (LWRS) Program. Within this framework, Idaho National Laboratory (INL) is working closely with utilities to assist with the challenges associated with control room modernization.

To evaluate, refine, or develop new control room technologies, the DOE LWRS Control Room Modernization Project has built a full-scale control room simulator at INL's Human Systems Simulation Laboratory (HSSL) (Boring et al., 2012 and 2013). The HSSL (see Figure 1) is based on glasstop simulator hardware, which represents touchscreen displays of the control boards found in conventional power plants. The boards may be virtually modified to represent new layouts of controls and introduce digital control systems to the boards. The HSSL is also reconfigurable, which allows different plant models to be studied.

The U.S. Nuclear Regulatory Commission publishes the Human Factors Engineering Program Review model in NUREG-0711, Rev. 3 (O'Hara et al., 2012). The purpose of NUREG-0711 is to detail the

procedure by which regulatory staff review the effectiveness of human-system interfaces (HSIs) related to new construction and license amendments. While NUREG-0711 is an invaluable guide to the regulator for human factors activities, it is not written specifically as a roadmap for utilities. Thus, INL staff have worked with utilities to augment the guidance in NUREG-0711 and develop a practicable framework to ensure that new HSIs introduced into the control room are usable, efficient, and safe.

The process INL has adopted is called the Guideline for Operational Nuclear Usability and Knowledge Elicitation (GONUKE) (Boring et al., 2015) and is depicted in Figure 2. GONUKE mirrors stages of NUREG-0711 and explains for a utility perspective the different data that can be collected to build the safety case for the system being modernized. The key idea featured here is that of the iterative design cycle—one in which HSIs are designed, prototyped, tested, and improved in a cyclical fashion. Thus, verification and validation (V&V) becomes an ongoing activity rather than a single terminating activity after the completion of the design. Feedback provided early in the design process ensures that error traps in the HSI are eliminated rather than ingrained in the design.

The INL team has hosted a series of studies with reactor operators from partner utilities. These studies have followed the process in Figure 2, successively working through more refined versions of the design of the system. Experiences are captured in EPRI 3002002770, Guidance for Developing a Human Factors Engineering Program for an Operating Nuclear Power Plant. The



Fig. 1: Virtual Simulator at the HSSL

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studies have streamlined the data collection process using the concept of As Low As Reasonable Assessment (ALARA), which borrows techniques from discount usability (Boring and Lau, 2015).

Work to date under the LWRs Control Room Modernization Project has established a systematic process for upgrading control rooms, with a focus on applying human factors evaluations iteratively throughout the design cycle (Boring et al., 2015; Boring and Joe, 2014; Boring and Lau, 2015). This process not only ensures the regulatory requirements of modifying the control room are met, but it also serves to establish crucial operator buy-in on upgrades. To date, this work has focused on upgrading legacy analog instrumentation and control with digital HSIs. The digital HSIs are representative of the types of technology that are currently being deployed in various process control industries, including nuclear power plants. Future work will highlight opportunities to design and evaluate advanced HSI technologies.

References

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		Evaluation Phase			
		Pre-Formative (Planning and Analysis ¹)	Formative (Design ¹)	Summative (Verification and Validation ¹)	Post-Summative (Implementation and Operation ¹)
Evaluation Type	Expert Review (Verification)	[1] Design Requirements Review	[2] Heuristic Evaluation	[3] System Verification	[4] Requalification against New Standards
	User Study (Validation)	[5] Baseline Evaluation	[6] Usability Testing	[7] Integrated System Validation	[8] Operator Training
	Knowledge Elicitation (Epistemiation)	[9] Cognitive Walkthrough (Task Analysis)	[10] Operator Feedback on Design	[11] Operator Feedback on Performance	[12] Operator Experience Reviews

¹ Corresponding Phases in NUREG-0711.

Fig. 2: Phases and types of validation in the GONUKE Process.

R.L. Boring, T.A. Ulrich, J.C. Joe, R.T. Lew, "Guideline for Operational Nuclear Usability and Knowledge Elicitation (GONUKE)," *Procedia Manufacturing*, 3, 1327-1334, 2015.

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Acknowledgements

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IN MEMORY OF DR. DON MILLER

March, 1942–August 28, 2015

It is with great sadness that we mark the passing of our dear friend and colleague, Dr. Don Miller. Dr. Miller was an internationally-recognized expert in the advancement of instrumentation and control systems for nuclear power plants.

Dr. Miller completed both a B.S. (1964) and M.S. (1966) in Physics at Miami University and M.S. and Ph.D. in Nuclear Engineering in 1971 at The Ohio State University. After his graduation, Miller joined the faculty at OSU as an Assistant Professor. He went on to achieve full Professorship and to serve as the Chair of the Nuclear Engineering Program from 1978-1992 and the Director of the Nuclear Reactor Laboratory at Ohio State. He was involved with the Instrument Society of America (ISA), the Institute of Electrical and Electronic Engineers (IEEE), and the American Nuclear Society (ANS). He was elected as Fellow of ANS in 1991 and served as president 1996-1997. In the 1980s, he also became involved with the Nuclear Regulatory Commission (NRC) and was appointed to serve a 4-year term on the NRC Advisory Committee on Reactor Safeguards in 1995. Miller represented both ANS and the NRC internationally, with visits to England, France, Finland, Austria, Norway, Japan, Taiwan, South Korea, and India. He retired from OSU in 2010, but continued to be actively involved in the University as a season ticket holder at Buckeye

football games and as advisor to many graduate students in his department. During his tenure at OSU, Miller was the recipient of the OSU College of Engineering Research Award and recognized as an OSU College of Engineering Distinguished Alumnus. Subsequent to his retirement, he earned the OSU Mechanical Engineering Bertha Lamme Feicht award in 2010 for his many noteworthy contributions to Nuclear Engineering, while overcoming significant obstacles during the span of his career. Miller also maintained ties to Miami University throughout his life, recognized as a Hughes Society OWL (Older Wiser Leader) upon his 50th reunion.

Ted Quinn, chair of OSU Mechanical and Aerospace Engineering Nuclear Engineering External Advisory Board and ANS Past President 1998-1999, noted that Miller's lasting legacy of instrumentation and control greatness at Ohio State is recognized around the world. "His ability to continue his life's work amid the health challenges he faced is an example to all of us," Quinn said.

In 2009, HFICD established The Don Miller Award. Miller was the first recipient of the award, which recognizes outstanding engineering research and development, licensing or project achievements in the fields of nuclear instrumentation and control or human machine interface worldwide, as exemplified by Miller's career.

HUMAN FACTORS ENGINEERING FOCUS: CURRENT RESEARCH IN HUMAN FACTORS ENGINEERING



Dr. Poong Hyun Seong, KAIST

Since the first commercial nuclear power plant (NPP) started operation in 1954, main concerns and improvements were focused on the physical features of NPPs. However, the several NPP accidents such as Three Miles Island (TMI), Chernobyl, and Fukushima revealed that human error is one of the main contributors to cause the NPP accidents. Institute of Nuclear Power Operation (INPO) published a report which analyzed 2,379 operation experience reports from 2010 to 2011 and the result also showed that 48% of the events were related to human errors. In this manner, human factors researches have been vigorously conducted to maintain the safe operation of NPPs. There are five representative works to reduce human errors: (1) Enhancing safety culture, (2) Improving education and training, (3) Improving procedures, (4) Increasing automation, and (5) Improving man-machine interface (MMI) and operator aids.

The first is to enhance safety culture which is organizational culture where everybody places safety first in every activities and safety culture affects all the processes and decisions in NPPs. It indicates that strong safety culture is necessary to operate the NPPs safely. The second is to improve education and training that builds qualified human infrastructure so that all personnel can perform adequate tasks no matter what situation happens in the field. The third is to improve procedures since all personnel should follow the operation or maintenance procedures which outline the prescriptions of techniques or tasks in the complex situations of plants. The fourth is to increase automations of the plant system to pursue the reduction of manual tasks for accomplishing power genera-

tion and safety functions in NPP operations. The last is to improve MMI and operator aids which support the operators to diagnose the occurrence of an accident, to monitor the performance of the plant system, and to control the plant system properly. The insights from five works may contribute to reduce human errors in NPPs. The five works are related to two manners of human error prevention. The first is to improve the performance of human operators such as situation awareness (SA), communication, decision making, and cooperation. The second is to provide the improved work environment for the operators to operate or maintain the plant system efficiently and safely.

Korea Advanced Institute of Science and Technology (KAIST) Nuclear Instrumentation & Control and Information Engineering Laboratory (NICIEL) has exhaustively performed those five works to enhance the safety of NPPs. To increase the performance of operators, NICIEL has developed several quantitative methods of operators' performance and has provided systematic education/training programs. NICIEL adopted various methodologies such as Bayesian inference, probabilistic safety assessment (PSA), physiological measurements for quantitative estimation of safety culture, SA, and team communication of NPP operators. In addition, construction of the efficient and safe working environment is crucial as well as improvement of operator's performance. Procedures, guidelines and MMIs are critical factors to provide efficient and safe working environments. In this manner, NICIEL has conducted studies to assure severe accident management guidelines (SAMG). Also, NICIEL is also focusing on development and validation of operation support systems (OSS) since adoption of automation and operator aids can significantly decrease human errors. Especially, studies related to optimization of automa-

HUMAN FACTORS ENGINEERING FOCUS

tion level and development of OSS evaluation method have been conducted recently.

Among various research topics in NICIEL, following three human factors related topics will be presented during American Nuclear Society (ANS) 2015 winter meeting.

1. Comparative study on communication features in conventional and digitalized type main control rooms (MCRs)

The communication errors in conventional and digitalized MCRs were investigated by using communication error taxonomy based on simplified one-way communication model and verbal protocol data (i.e. audio-visual recording data) taken from conventional and digitalized MCR mock-up in Republic of Korea. With the results of this study, it seems to be able to diagnose the improvements and drawbacks of digitalized MCRs in communication point of view. Additionally,



the results can provide useful insights for further studies with the purpose of reducing communication errors by improving education and training, automation, and so on.

2. Development of evaluation system for individual's safety culture competencies

An evaluation system of individual's safety culture competency was developed. For the first step, individual safety culture competencies were derived based on strategic success modeling (SSM) method and total 20 competencies for executive managers, 67 competencies for supervisors, and 93 competencies for employees were derived. In order to evaluate the competencies of individual safety culture, three methods were adopted: (1) System indicator, (2) Behavioral indicator, and (3) Questionnaires. It is expected that the suggested method is not only useful to foster safety culture of individual but also properly represents the structure of individual safety culture, by offering more objective and quantitative results within a short time.

3. Empirical Study on situation awareness of ideal and practical operators

The differences between SA of ideal operators and real operators were empirically studied. Bayesian inference has been widely used to evaluate SA of human operators with the assumptions that operators are ideal (i.e. able to receive all necessary information and process them correctly). However, real operators in NPPs are not as perfect as ideal operators. Throughout this study, contributors of the SA differences between ideal operators and real operators were determined empirically. Moreover, further empirical studies on the effects of MMI (improved or deteriorated) to both ideal and real operators were conducted.

HASHEMIAN, AMS HONORED FOR I&C TRAINING EXCELLENCE

David Goddard, University of Tennessee College of Engineering

The American Nuclear Society has honored University of Tennessee, Knoxville, alumnus, adjunct professor and longtime supporter Hash Hashemian with one of its highest awards, selecting his team as the Robert L. Long Training Excellence winner for 2015.

“This award is humbling but gratifying,” said Hashemian. “It is validation of the effort we put in to preparing the nuclear workforce for the current challenges and for those yet to come.”

The award recognizes an individual or group that has demonstrated sustained excellence in nuclear training.

Hashemian was chosen for both his teaching in UT’s Department of Nuclear Engineering and his role as president of Analysis and Measurement Services.

One of the leading nuclear technology companies in the country, AMS began in 1977 when Hashemian and former nuclear engineering department head Tom Kerlin co-founded the company to aid the industry with testing and problem solving.

In the almost 30 years since, the Knoxville-based company has grown to become a vital player in the nuclear industry in the U.S., serving every nuclear power plant in the country as well as some overseas.

Richard Coe, chairman of the ANS honors awards committee for the group’s Education, Training and Workforce Development Division, extended his congratulations to Hashemian along with an invitation to the ANS winter meeting on Nov. 9 in Washington, D.C.

Nominations for the award must come from other members or groups in the organization, highlighting the respect Hashemian has earned from his peers.

“To be honored is nice enough, but when it comes from the recognition of the people you work with it makes it all the more special,” said Hashemian.



AMS Corporation Training Management Team: (standing left to right) Chad Kiger, Dr. Hash Hashemian, Brent Shumaker, and Ryan O’Hagan (sitting)

2015 - 2016 HFICD OFFICIALS

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Embedded Software Engineer
Lockheed Martin Corporation



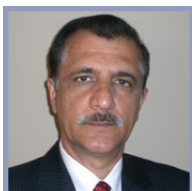
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R&D Staff
ORNL



Brent Shumaker
SECRETARY
Senior Systems Engineer
AMS Corporation



Mehdi Tadjalli
TREASURER
I&C Division Manager
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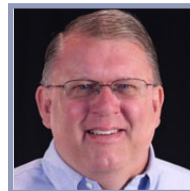
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M. Steve Coppock
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Matt Humberstone
Project Manager
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Joseph Naser
2013-2014 CHAIR
Technical Executive
EPRI

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Zachary Welz
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Upcoming ANS Meetings

2015 ANS Winter Meeting and Nuclear Technology Expo

November 8-12, 2015

"Nuclear: The Foundation of Sensible Policy for Energy, Economy and the Environment"

Washington, D.C.

Marriott Wardman Park

- **Division Program Committee Meeting:**
Sunday November 8 from 11am - 12pm
Meeting room TBD

- **Division Executive Committee Meeting:**
Sunday November 8 from 12pm - 2:30pm
Meeting room TBD

2016 International Conference on Advances in Nuclear Power Plants (ICAPP)

April 17-20, 2016

San Francisco, California

Hyatt Regency San Francisco

2016 ANS Annual Meeting

June 12-16, 2016

New Orleans, Louisiana

Hyatt Regency New Orleans

Utility Working Conference and Vendor Technology Expo

August 14-17, 2016

Amelia Island, Florida

Omni Amelia Island Plantation



Save the Date: NPIC-HMIT 2017

We are excited to announce to the members of the HFICD information regarding the 2017 Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies (NPIC & HMIT) Conference. Building on the success of the last conference in Charlotte, NC in February 2015, the next NPIC & HMIT will be an embedded topical meeting within the 2017 ANS Annual Meeting. Please mark your calendars now, and join us in San Francisco, CA June 11 thru 15, 2017. As we are in the early phase of the planning process, we kindly ask that the members of the division provide any technical or panel session ideas to the organizing committee. As General Chairs of the meeting, we encourage you to be a part of this experience, and we are looking forward to seeing you there.

Sincerely,



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NPIC & HMIT 2017
General Co-Chairs

