



# ANS



## 12<sup>th</sup> Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies

June 13-17, 2021 | Providence, RI | Omni/Convention Center

### CALL FOR PAPERS

#### EXECUTIVE CHAIRS

##### General Chair

Pradeep Ramuhalli, ORNL

##### Technical Program Chair

Jamie Coble, UTK

##### Technical Chair (I&C)

Hyun Gook Kang, RPI

##### Technical Co-Chairs (HF)

Jeffrey Joe, INL











Paula Savioja-Kangasluoma, STUK



IAEA

International Atomic Energy Agency

### ABSTRACT DEADLINE: TUESDAY, DECEMBER 15, 2020

<b>DECEMBER</b>			ABSTRACTS DUE: <b>Tuesday, December 15</b> (fewer than 1000 words)
<b>JANUARY</b>			REVIEW NOTIFICATION: <b>Monday, January 4, 2021</b>
<b>FEBRUARY</b>			FULL PAPERS DUE: <b>Monday, March 1, 2021</b>
<b>MARCH</b>			REVIEW NOTIFICATION: <b>Sunday, March 14, 2021</b>
<b>APRIL</b>			FINAL PAPERS DUE: <b>Thursday, April 15, 2021</b>

#### ABOUT THE MEETING

This topical meeting is the 12th in a series organized by ANS's Human Factors, Instrumentation & Controls Division (HFICD). Authors are invited to participate in the International Topical Meeting on Nuclear Plant Instrumentation, Control, and Human-Machine Interface Technologies (NPIC & HMIT).

Sponsored by the American Nuclear Society (ANS), NPIC & HMIT builds upon the successes of previous meetings. The meeting welcomes the submission of full-length technical papers, which will be peer reviewed and published as conference proceedings. Submitted papers must be presented at the meeting. Detailed information and announcements regarding the conference will be posted on [ans.org/meetings/view-310/](https://www.ans.org/meetings/view-310/).

#### ABSTRACT GUIDELINES

Maximum of one page identifying title, authors, affiliations, and three paragraphs (total fewer than 1000 words) describing the key concepts of the paper. A wide range of topic areas are highlighted on the second page of this call. Authors are encouraged to submit papers on these proposed topics as well as others. Authors of accepted abstracts will be notified by **January 4, 2021**.

#### FULL PAPER SUBMISSION

Full papers must describe work that is new, significant, and relevant to the nuclear industry and the subject of the conference. Authors of accepted papers must agree to register and attend the conference and present their papers in person. Papers that are not presented in person at the conference will not appear in the final conference publication. Authors of accepted full papers will be notified by **March 15, 2021**.

#### SUBMIT AN ABSTRACT

<https://www.ans.org/meetings/view-310/>

#### PROGRAM SPECIALIST

Janet Davis

708-579-8253

[jdavis@ans.org](mailto:jdavis@ans.org)



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### SUGGESTED TOPICS

#### INSTRUMENTATION AND CONTROLS (I&C)

Data Analytics, Machine Learning, and Artificial Intelligence

Autonomous Control and Operation

Digital Twins

Latest Trends in Digital I&C

Management of I&C Aging and Obsolescence

Electromagnetic Compatibility (EMC) and EMI/RFI Issues

Nuclear Energy R&D in I&C Area

Next Generation I&C Systems

Safety Critical Software Development, Qualification, and V&V

I&C and OLM Considerations for Life Beyond 60 Years

Wireless Technologies for Nuclear Facilities

Education and Training of I&C Professionals

Diversity and Defense in Depth (D3)

Modeling Digital I&C Systems in PRA/PSA

Advanced Surveillance, Diagnostics, and Prognostics

Field Programmable Gate Array (FPGA)

I&C Modernization Experience

SMR Instrumentation and Control

I&C for Advanced Reactors

On-line Monitoring for Maintenance Optimization

Hazard and Failure Mode Analysis for Digital Systems

I&C Regulations, Standards, and Guidelines

Digital System Reliability

Light Water Reactor Sustainability (LWRS)

On-Line Monitoring of Rod Control Systems

Cyber Security in Digital I&C

Managing and Preserving I&C Knowledge and Competence

Advanced Sensors and Measurement Technologies

Cable Aging and Cable Condition Monitoring

Research Reactor I&C

In-Pile Instrumentation

I&C Lessons Learned from Fukushima

Productivity/Efficiency Improvement

Digital Control System Applications

General Sessions in I&C

#### HUMAN FACTORS (HF)

Human Factors Aspects of Cyber Security

HFE Approaches in New Build Projects

Current Concepts in Advanced Control Rooms

Experience with Control Room Modernization

Lessons Learned from the Design and Operation of Generation III and III+ Reactors

Nuclear Energy R&D in HMI Areas

Applications of Technology to Enhance O&M

Design and Development of Group-View, Wall-Panel Displays

Visualization Techniques to Improve Human Decision Making

Computerized Procedure Systems

Use of Virtual Reality to Support Design and O&M

Use of Simulation for Design, Engineering, Maintenance and Verification Activities

Emerging Concepts of Operations for Advanced Reactors

Innovative Human Interface Technologies

HFE Use of PRA/PSA Insights and Results for Design and Operations

Computerized Operator Decision and Support Systems

Innovative Solutions to Alarm Overload

HFE Verification and Validation: Approaches and Methods

Designing Control Rooms for Small Modular Reactors

HFE Education and Training

Lessons Learned from Soft Controls in Plant Operations

Human Factor Lessons from Fukushima

HFE Contributions to Productivity and Efficiency

Human Factors Aspects of SMRs

HFE Standards and Guidelines Update

Workstation and Control Room Layout Design for Computer-Based Control Rooms

Use of Work-Domain and Cognitive Task Analysis for Human-System Interface Design

Human Reliability Issues in Digital Systems and Computer-Based Control Rooms

Operation of Hybrid Control Room

General Sessions in Human Factors

Advances in HFE Design and Analysis Tools

Advances in Human-Automation and Human Performance Assessment

Note: The topics listed above are not session titles; they are provided just as a guide for paper topics. The technical program committee will be happy to expand the areas and include additional topics into the program. Please contact the Technical Program Chairs with suggestions.