

# IEEE PES

## Nuclear Power Engineering Committee Annual Report 2018

Chair: Daryl Harmon

Vice-chair: John White

Secretary: Mark Bowman

Treasurer : Keith Bush

### 1. Significant Accomplishments

The following Nuclear Power Engineering Committee (NPEC) standards were approved during 2018:

IEEE Std 384 IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits

IEEE Std 603 IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations

IEEE Std 690 IEEE Standard for the Design and Installation of Cable Systems for Class 1E Circuits in Nuclear Power Generating Stations

The following NPEC PARs were approved by NPEC ADCOM during 2018:

P62582-1 Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition monitoring methods Part 1: General

P62582-2 Nuclear power plants - Instrumentation and control important to safety - Electrical equipment conditioning monitoring Part 2: Indenter modulus

P62582-4 Nuclear power plants - Instrumentation and control important to safety - Electrical equipment conditioning monitoring Part 4: Oxidation induction measurements

P384a Standard Criteria for Independence of Class 1E Equipment and Circuits Amendment to support medium voltage separation

P420 Standard for the Design and Qualification of Class 1E Control Boards, Panels, and Racks Used in Nuclear Power Generating

P7-4.3.2 Standard Criteria for Programmable Digital Devices in Safety Systems of Nuclear Power Generating Stations

P338 Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems

P741 IEEE Standard Criteria for the Protection of Class 1E Power Systems and Equipment in Nuclear Power Generating Stations

P845 IEEE Guide to Evaluation of Man-Machine Performance in Nuclear Power Generating Station Control Rooms and Other Peripheries

P1023 - Application of Human Factors Engineering to Systems, Equipment, and Facilities of Nuclear Power Generating Stations

P308 IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations

P765 Standard for Preferred Power Supply for Nuclear Power Plants

P577 IEEE Standard Requirements for Reliability Analysis in the Design and Operation of Safety Systems for Nuclear Power Generating Stations

P649 IEEE Standard for Qualifying Class 1E Motor Control Centers for Nuclear Power Generating Stations

P692 IEEE Standard Criteria for Security Systems for Nuclear Power Generating Stations

P60980-344 Commercial Nuclear Facilities - Equipment Important to Safety - Seismic Qualification

P61226 Nuclear power plants - instrumentation and control systems important to safety - Classification of instrumentation and control functions

NPEC also voted to approve a revised Policies and Procedures manual, consistent with the tech council requirements and template, at the July meeting. This revision also contained a small number of minor scope changes and name changes for the subcommittees.

## 2. Benefits to Industry and PES from the Committee Work

NPEC is responsible for developing and maintaining nuclear power plant standards in the electrical and electronic area within PES. These standards are used by the nuclear industry around the world to design and maintain nuclear power plants and other nuclear facilities. Many NPEC standards are endorsed by the US Nuclear Regulatory Commission in Regulatory Guides.

NPEC also provides coordinated responses to the USNRC draft regulatory guides, rule making documents and NUREG documents released for public comment.

NPEC has recently been proactive in developing joint logo standards with IEC, which will benefit the nuclear industry by providing common set of standards that will be used around the world. For example, in response to lessons learned from the Fukushima event in Japan NPEC and IEC are nearing the completion of a new standard related to Spent Fuel Pool Monitoring Instrumentation. This joint logo standard will be balloted in both organizations in early 2019.

The IEEE Standards Association (IEEE-SA) held a Fellowship Program for regulators at the NPEC meeting from January 21-24 2018. This program invites regulators from developing and emerging economies to attend IEEE standards development meetings to engage with technologists and experience standards development meetings first-hand. This provided a venue that supported dialogue and information-sharing between regulators and technology experts

Participants in this year's program were Dr. Mohd Ashhar bin Hj Khalid, Director-General, Malaysian Nuclear Agency and Avinash Singh, Functional Coordinator: Operational Safety: Standards, Authorisations, Reviews and Assessments at the National Nuclear Regulator of South Africa.



*Dr. Mohd Ashhar bin Hj Khalid and Mr. Avinash Singh pose with Mr. Thomas Koshy, Chair of the IEEE Nuclear Power Engineering Committee*

### 3. Benefits to NPEC Volunteer Participants from the Committee Work

The committee is comprised of an international group of technical experts from nuclear utilities and plant owners, vendors, architecture engineers, and regulators representing a wide cross-section of the nuclear industry. NPEC, subcommittee and working group meetings provide the opportunity for this diverse set of volunteers to work together and learn from each other's perspectives regarding standards development.

NPEC and its subcommittees held two meetings during 2018. The January meeting was held in New Orleans, Louisiana and the July meeting was held in Mystic, Connecticut. In addition to the standards work, as evidenced in item 1, a diverse set of technical presentations were made at the two NPEC meetings as follows:

Application of IEEE 384 physical separation requirements in the AP1000(r) Plant Raceway Design

Risk Informed Approach to Equipment Categorization

EPRI/TVA DG Tune Method using Frequency Domain Analysis

Industry Perspective of the NRC Digital I&C Integrated Action Plan (IAP)

Future Potential Attack Patterns Against Nuclear Power I&C Systems

IEC Standards for Cyber security

Post-Fukushima Actions.

#### 4. Recognition of Outstanding performance

A past Chair of NPEC award was presented to George Ballassi.

WG -4.7 Received the working Group of the Year award. The Chair – Mark Bowman, Vice-Chair John Disoswy, and the Working Group members were recognized.

The NPEC Distinguished Service award was given to Ken Fleischer.

Ken Fleischer presented an award for outstanding contributions to Singh Matharu. Mr. Matharu made significant contributions to IEEE 387.

#### 5. Coordination with Other Entities

NPEC maintains liaison between IEEE and ANSI, ASME, ANS, ASTM and ISA , as well international organizations IEC and IAEA regarding all nuclear power plant matters.

#### 6. Significant Plans for the next period

NPEC will continue its standards development activities through its subcommittees and working groups. NPEC meetings will be held in Charlotte, North Carolina in January and Williamsburg, Virginia in July.

Respectfully Submitted,



Daryl Harmon

NPEC Chair