

IEEE Power and Energy Society Entity Annual Report

2020

Entity: Nuclear Power Engineering Committee

Website: <https://site.ieee.org/pes-npec>

Chair: John White

Vice-Chair: Mark Bowman

Secretary: Robert Konnik

Immediate Past Chair: Daryl Harmon

1. Significant Accomplishments:

The following Nuclear Power Engineering Committee (NPEC) standards were approved during 2020:

IEEE Std 336 IEEE Recommended Practice for Installation, Inspection, and Testing for Class 1E Power, Instrumentation, and Control Equipment at Nuclear Facilities

IEEE Std 308 IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations

IEEE Std 628 IEEE Standard Criteria for the Design, Installation, and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Power Generating Stations

IEEE Std 1023 IEEE Approved Recommended Practice for the Application of Human Factors Engineering to Systems, Equipment, and Facilities of Nuclear Power Generating Stations and Other Nuclear Facilities

IEEE Std 60989-344 IEEE/IEC International Standard - Nuclear facilities - Equipment important to safety - Seismic qualification

The following NPEC PARs were approved by NPEC ADCOM during 2020:

IEEE PC37.105 Standard for Qualifying Class 1E Protective Relays and Auxiliaries for Nuclear Power Generating Stations and Other Nuclear Facilities

IEEE PC37.98 Standard for Seismic Qualification Testing of Protective Relays and Auxiliaries for Nuclear Facilities

IEEE P63332-387 Nuclear Facilities – Electrical Power Systems – Part 387: Diesel Generator Units Applied as Standby Power Sources

IEEE P2411 Human Factors Engineering Guide for the Validation of System Designs and Integrated Systems Operations at Nuclear Facilities.

2. Benefits to Industry and PES Members 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 leadership and members participated in the following standards-focused events in the nuclear industry in 2020:

ANS/NEI Advanced Reactors Codes and Standards Workshop held virtually on June 23, 2020 where NPEC was part of a panel discussion identifying key issues that impede progress on advanced reactor standards and potential solutions.

USNRC organized meeting on Regulatory Guidance Framework for IEEE Electrical Standards held virtually on July 20, 2020 where topics including feedback on the USNRC proposed framework, industry use of Regulatory Guides and periodic reviews were addressed.

USNRC organized Standards Forum held virtually on October 13, 2020 where NPEC members were panelists on three panel sessions including one related to Harmonization of Codes and Standards under Unified Risk-informed and Performance-based Principles.

NPEC has continued to be proactive in developing joint logo standards with IEC, which will benefit the nuclear industry by providing a 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 was re-balloted in both organizations in 2020 after comment resolutions were incorporated. It has now been successfully balloted in both IEEE and IEC and is expected to be published in early 2021.

3. Benefits to 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. The committee currently has 42 active members. 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 2020. The January meeting was held in Charlotte, North Carolina and the July meeting was scheduled to be held in Mystic, Connecticut but was held virtually due to the COVID-19 pandemic. In addition to the standards work, as evidenced in item 1, a diverse set of technical presentations were made at the two 2020 NPEC meetings as follows:

- Estimating the Effects of Small Voltage and Frequency Changes on Industrial Induction Motor loading

- ANS Special Committee on Advanced Reactor Policy Report

- Enabling the Modern Nuclear Plant

- IEC Standards for SMRs

- USNRC Regulatory Guidance Framework for IEEE Electrical Standards

4. Recognition of Outstanding Performance:

NPEC made the following outstanding performance recognitions during 2020.

Working Group 4.2.2 received the 2019 NPEC Outstanding Standard Award for IEEE 2420-2019 IEEE Standard Criteria for Combustion Turbine-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations.

The NPEC Distinguished Service award was given to John Disosway for many years of dedicated service to the IEEE PES Nuclear Power Engineering Committee; as long-time caretaker of committee policies and procedures, as leader of the task force on terminology, and as an active member and officer of several NPEC subcommittees and working groups.

The 2019 Prize Paper Award was presented to Dr. Abdelrahman Karrar of the University of Tennessee at Chattanooga for the paper Estimating the Effects of Small Voltage and Frequency Changes on Industrial Induction Motor Loading.

5. Coordination with Other Entities (PES Committees, CIGRE, standards, etc.):

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. New Technologies of Interest to the Committee:

Assuring that NPEC standards are applicable to reactor types other than light water reactors and applicable to advanced reactor development.

7. Global Involvement

PES is looking to increase involvement with members from Regions 8, 9 and 10 (Africa, Europe, Middle East, Latin America, Asia and Pacific). Please provide the following information.

Total Number of committee members 42	Officers from regions 8,9 and 10 0	Subcommittee officers from regions 8, 9 and 10 0	Subcommittee members from regions 8,9, and 10 0
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8. Problems and Concerns:

NPEC continued to make progress towards the IEEE financial expectation that NPEC would have sufficient funds to cover two failed meetings. By completion of the 20-01 meeting in January 2020 NPEC had achieved this goal.

There are no other problems or concerns.

9. 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 virtually in January 2021 due to the continued pandemic (originally intended to be in New Orleans, La with the PES JTCM) and in Mystic, Connecticut in July 2021, if possible.

Submitted by: John White

Date: 1/26/21