

IEEE Power and Energy Society Entity Annual Report 2021

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 IEEE NPEC Conformity Assessment Steering Committee made significant strides to IEEE's goal of having products that are certified to IEEE nuclear standards. The IEEE NPEC Conformity Assessment Program received its first contracts from laboratories and manufactures seeking to have their products certified by the IEEE.

A detailed description of the IEEE NPEC Conformity Assessment Program (ICAP) is provided in Section 2, *Benefits to Industry and PES Members from the Committee Work*.

The following Nuclear Power Engineering Committee (NPEC) standards were approved for balloting during 2021:

IEC/IEEE Std 62582-2, *Nuclear power plants – Instrumentation and control important to safety – Electrical equipment condition monitoring methods – Part 2: Indenter modulus*

IEC/IEEE Std 62582-4, *Nuclear power plants – Instrumentation and control important to safety – Electrical equipment condition monitoring methods – Part 4: Oxidation induction techniques*

IEEE Std 577, *Standard Requirements for Reliability Analysis in the Design and Operation of Safety Systems for Nuclear Power Generating Stations*

IEEE Std 741, *Standard for Criteria for the Protection of Class 1E Power Systems and Equipment in Nuclear Power Generating Stations*

IEEE Std 765, *Standard for Preferred Power Supply (PPS) for Nuclear Power Generating Stations (NPGS)*

IEEE Std 1786, *Guide for Human Factors Applications of Computerized Operating Procedure Systems (COPS) at Nuclear Power Generating Stations and Other Nuclear Facilities*

The following NPEC PARs were approved by NPEC ADCOM during 2021:

IEEE P1786, *Guide for Human Factors Applications of Computerized Operating Procedure Systems (COPS) at Nuclear Power Generating Stations and Other Nuclear Facilities*

2. Benefits to Industry and PES Members from the Committee Work:

In September of 2014 the Nuclear Power Engineering Committee (NPEC) Conformity assessment Steering Committee was formed. That committee working with IEEE Conformity Assessment Program (ICAP) began working together to develop a conformity assessment program for IEEE 323, *IEEE Standard for Qualifying Class 1E equipment for Nuclear Power Generating Stations*.

The Steering Committee was formed from a diverse group of members representing Manufacturers, Test Laboratories, Industry consultants, Reactor Designers, and Utilities. The committee members, in addition to their diverse technical experience, represented countries from Asia, Europe and North America. The first goal of the steering committee was focused on providing a high level of assurance that IEEE qualification standards are being complied with, during the qualification of components intended for use in nuclear power plants. This process is based on the recognition of laboratories and manufacturers. Manufacturers would have their products tested at recognized laboratories. After meeting these requirements manufacturers then have the ability to submit products for IEEE Certification. An IEEE Certified product will be easily recognizable and traceable to specific test reports.

The certification process that has been developed is identified as the IEEE EQ Navigator. The IEEE EQ Navigator process is intended to help improve quality control, standardize the format for the development of test reports, reduce the use of counterfeit parts and provide 3rd party verification that the testing of equipment met the requirements of IEEE standards. An IEEE Certification will provide nuclear power plant designers and owners with a level of confidence in Nuclear Qualified equipment that has never been available in the past.

In October of 2021 the first laboratories and manufactures began the recognition process. The industry is being led by Kinetrics Inc , NTS and TE Connectivity. The recognition process and the certification of components will continue and expand in 2022. The EQ Navigator process is intended to reduce cost, improve quality and help bring the world into standard based compliance.

<https://www.youtube.com/watch?v=Rvdhgyxobxl>

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. The US Nuclear Regulatory Commission in Regulatory Guides endorses many NPEC standards.

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 was 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 2021. The January meeting was a virtual meeting and the July meeting was held in Mystic, Connecticut.

4. Recognition of Outstanding Performance:

The IEEE Standards Association presented its Conformity Assessment Award to *IEEE NPEC Conformity Assessment Steering Committee*. The award was given “For contributions made to create conformity assessment programs for IEEE nuclear standards and for aiding the industry in streamlining equipment qualification activities using EQ Navigator”.

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 5
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8. 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 person starting in January 2022.

Submitted by: John White

Date: 1/30/22