NRC STANDARDS FORUM

Thomas Koshy, Chairman

Nuclear Power Engineering Committee

Acting Branch Chief

Instrumentation, Controls and

Electrical Engineering Branch

DE/RES/USNRC

Agenda

- IEEE and NPEC Introduction
- NPEC Industry Contribution
- New Project- IEEE Activity

The world's largest professional association

Global Reach

430,000+
Members

160+
Countries

1,300+
Annual Conferences

Technical Breadth

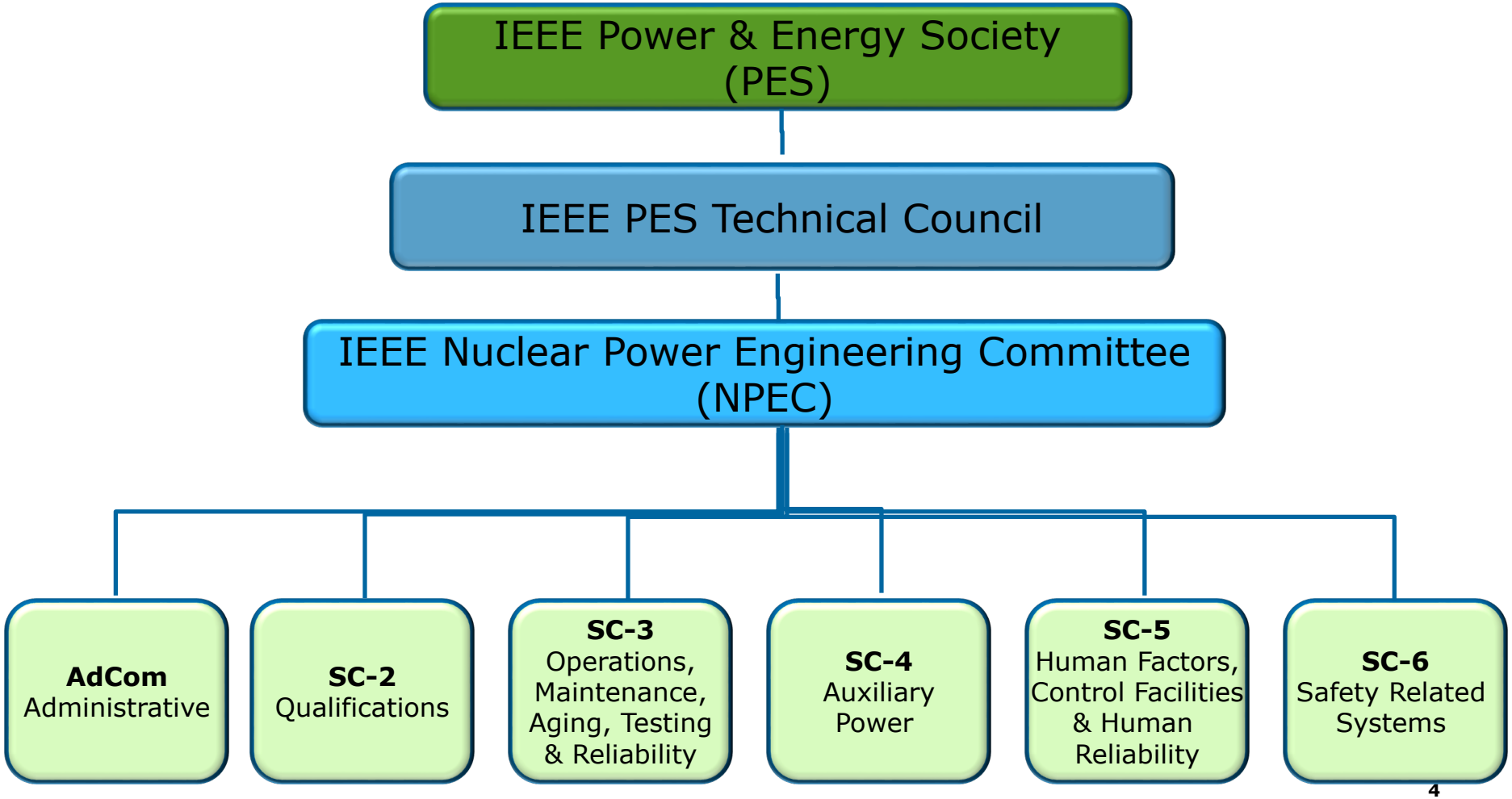
39 Technical Societies
6 Technical Councils

4,000,000+
Technical Documents

180+
Top-cited Periodicals

- Aerospace and Electronic Systems
- Antennas and Propagation
- Biometrics Council
- Broadcast Technology
- Circuits and Systems
- Communications
- Components, Packaging, and Manufacturing Technology
- Computational Intelligence
- Computer
- Consumer Electronics
- Control Systems
- Council on Electronic Design Automation
- Council on Superconductivity
- Dielectrics and Electrical Insulation
- Education
- Electron Devices
- Electromagnetic Compatibility
- Engineering in Medicine and Biology
- Geoscience and Remote Sensing
- Industrial Electronics
- Industry Applications
- Information Theory
- Instrumentation and Measurement
- Intelligent Transportation Systems
- Magnetics
- Microwave Theory and Techniques
- Nanotechnology Council
- Nuclear and Plasma Sciences
- Oceanic Engineering
- Photonics
- Power Electronics
- **Power & Energy**
- Product Safety Engineering
- Professional Communications
- Reliability
- Robotics and Automation
- Sensors Council
- Signal Processing
- Social Implications of Technology
- Solid-State Circuits
- Systems, Man, and Cybernetics
- Systems Council
- Technology and Engineering Management
- Ultrasonics, Ferroelectrics, and Frequency Control
- Vehicular Technology

IEEE PES Nuclear Power Engineering Committee (NPEC) Structure



IEC –IEEE Joint Standards

Joint Standards Issued

Standard	Year	Title
62582-1	2011	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition monitoring methods - Part 1: General
62582-2	2011	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition monitoring methods - Part 2: Indenter modulus
62582-3	2012	Nuclear Power Plants - Instrumentation and control important to safety - Electrical equipment condition monitoring methods - Part 3: Elongation at break
62582-4	2011	Nuclear power plants - Instrumentation and control important to safety - Electrical equipment condition monitoring methods - Part 4: Oxidation induction techniques
62582-5	2015	Nuclear Power Plants - Instrumentation and control important to safety - Electrical equipment condition monitoring methods Part 5: Optical time domain reflectometry
60780-323	2016	Qualification of Electrical Equipment Important to Safety for Nuclear Facilities REGULATORY GUIDE 1.89 - to be revised

Project	Type	Title
IEEE-344	Revision	Seismic Qualification of 1E Equipment (PAR being developed)
IEEE-1082	Revision	Human Action Reliability Analysis for Nuclear Power Generating Stations. THE NEW REVISION WILL BE ADOPTED BY IEC
P62582-6	New	Nuclear power plants -- Instrumentation and control important to safety -- Electrical equipment condition monitoring methods. Part 6: Insulation resistance

NPEC's Industry Contribution

New area of IEEE effort to efficiency and effectiveness in the procurement of Environmentally Qualified Electrical components

(A dozen labs waiting to be audited)

IEEE Certified™

FILE # / Category

NPEC XXXXX

NEW Project- IEEE ACTIVITY

Sponsor ORG	TASK ID	Research Project	IEEE Standard	Current IEEE Activity
EPRI	2014-08	Advanced Battery Evaluation	IEEE 535	EPRI & NRC participates
EPRI	2015-02	SMR Staff Optimization	None	Under review
EPRI	2015-09	Seismic Hi-Freq. Loadings	IEEE 344	Joint IEC revision on progress
		HTGRs	None	Under consideration
		Liquid metal Reactors +SFR	None	Under Consideration

Comments ?

Questions ?

NPEC Objective

Consensus building forum to produce standards from diverse organizations:

- Nuclear Plant owners, operators/utilities
- NSSS developers and vendors
- Architect Engineers Regulators
- Product & servicing companies
- Manufacturers

NPEC Scope

- NPEC scope covers all nuclear power related technical and standards writing activities within the IEEE.

- NPEC Fact Sheet
  - Identifies all subcommittees/working groups and standards maintained by them
  - Available to the public at: http://grouper.IEEE.org/groups/npec/index.html

IEEE Standards Endorsed Through Codifying & Regulatory Guides

Battery sizing & maintenance

Instrumentation & Control Systems (Analog & Digital)

Class 1E Electrical Power System

Primary Guidance for Environmental Qualification

Seismic Qualification

Human Factors (*in process*)

Post Accident Monitoring

NPEC's Industry Contribution

- Working aggressively to address increased use of digital technology (IEEE 603 – just balloted, IEEE 7-4.3.2)
- Committed to addressing evolving issues and producing acceptable solutions
- Committed to the nuclear promise in reducing costs and achieving operational excellence
- Welcoming ideas on areas where NPEC can facilitate advancements in these areas through new standards or revision to existing standards

International Collaboration & Benefits

- IEEE continues to build collaboration with other standards development organizations
- Various cooperation agreements with IEC exist and a memorandum with IAEA was recently signed
- Such collaboration leads to new plant designs conforming to joint / shared standards that have US requirements embedded
- Joint standards help the designers to get regulatory acceptance in multiple countries without undue effort.