

# IEEE Power Engineering Society Entity Annual Report

2014

**Entity: Nuclear Power Engineering Committee**

**Chair:** Stephen Fleger

**Vice-Chair:** Thomas Koshy

**Secretary:** Daryl Harmon

## 1. Significant Accomplishments:

### **Standards Revised:**

IEEE Std. P690, IEEE Standard for the Design and Installation of Cable Systems for Class 1E Circuits in Nuclear Power Generating Stations

IEEE Std. P1290, Guide for MOV Motor Application, Protection, Control and Testing in Nuclear Generating Stations

P60780-323, Nuclear Facilities – Electrical Equipment Important to Safety – Qualification.

NPEC, starting in 2007, has essentially completed a concerted effort to revise and update all of the standards under its cognizance in order to support the renewed interest of new nuclear power plant design and construction in the USA and abroad. With the advent of the revised standard revision protocol instituted by IEEE-SA, each standard is being evaluated using the 10 year cycle understanding that reaffirmation is no longer an option. Therefore the pace of revision efforts is more manageable resulting in a steady pace of working group efforts across NPEC.

### **Project Authorization Requests:**

P60780-323 - Qualification of Electrical Equipment Important to Safety for Nuclear Facilities (Dual Logo with the IEC)

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

## **Technical Presentations:**

A Conformity Assessment Program for Certification of Class 1E Devices.

Ravi Subramaniam, Technical Director, IEEE Conformity Assessment Program

Update of IAEA Safety Standards for Electrical and I&C Systems for Nuclear Power Plants, Alex Duchac, IAEA

Generator & Motor Qualification

Mr. A. Fernandez and Mr. Jim Casey, Electric Machinery

Proposed Rulemaking for 10 CFR 50.55a(h), "Incorporation by Reference of Institute of Electrical and Electronics Engineers Standard 603-2009," and Associated Regulatory Guidance, Rich Stattel USNRC

Progress on Severe Accident Instrumentation – J. Gleason, GLSEQ LLC

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

NPEC works primarily to support the nuclear industry. We have completed the update of existing standards that have been used in the industry for 40 years. We have met our commitment to having all of our standards current (revisions no older than 5 years) to support the resumption of construction of new nuclear plants. The commercial nuclear industry benefits directly from supporting this work for many years because of the continuity of membership and the understanding of the origins of the standards we maintain.

PES benefits by having a strong committee operating in this specialized sector of power generation. Nuclear has many unique requirements not found in other generation technologies. By supporting these needs with international consensus standards, PES broadens its base worldwide as the leading standards writing organization for the generation and delivery of electric power.

## **3. Benefits to Volunteer Participants from the Committee Work:**

Volunteer participants benefit directly from the work of NPEC by meeting and working with peers in all phases of the commercial nuclear industry (utilities, regulators, vendors, A/Es, private consultants). Such interaction brings together a broad range of talent that is useful in solving problems that members have.

Participants regularly communicate outside of meetings and resolve operating plant problems.

Participants regularly raise industry questions of interest to all members. Such a review causes participants to closely study the bases for the standards we maintain and improves their ability to apply these standards in their daily work. Similar to this, questions regarding the new technologies of digital electronics as they apply to nuclear power plants are causing the membership to reexamine the basis and applicability of the existing standards and prepare for revisions or new standards to incorporate these new technologies.

**4. Recognition of Outstanding Performance:**

None

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

NPEC regularly hears liaison reports from ASME, NRC, and more recently the Nuclear Risk Management Coordinating Committee (NRMCC). The NRMCC serves as a clearing house/coordinating body as the risk methodology gains traction within the nuclear industry as an alternative to the deterministic method.

In addition, NPEC is significantly engaged with the IEC. Several projects are underway that will create a joint-logo standard that is satisfactory for use world-wide. The most significant effort involves IEEE Std. 323. There have been several fits and starts to this project requiring significant sub-committee and NPEC officer involvement as well as international travel. This standard is currently in the ballot/comment resolution phase and will be published this year (2015).

## **6. New Technologies of Interest to the Committee:**

Small Module Reactors (SMRs) are receiving industry-wide attention. The financial burden on a utility hampers the initiation of new large nuclear power plants. SMR technology, under development by several companies, is viewed as a means to bring nuclear power electrical generation to more locations, at a lower cost, and is flexible with respect to capacity as modules can be added as demand increases. Using passive safety features and mostly buried, these plant designs are seen as a viable alternative if the construction challenges can be resolved to keep the cost down. NPEC is observing this activity to ascertain if IEEE standards will require revision or if new standards will be necessary to support the SMR successful deployment.

The severe reactor accident in Japan in 2011 is still influencing the industry and will for some time. NPEC is monitoring the developments seriously in order to anticipate potential changes to our standards as the industry and regulator reach incremental conclusions regarding design, equipment qualification, and overall response to a very unusual challenges.

## **7. Significant Plans for the Next Period:**

NPEC is exploring a new Class 1E certification concept. Such a certification is seen as similar to the ASME "N" stamp. This project is in its inception phase and must be organized. Also, NPEC is working to create a new standard that addresses the electromagnetic compatibility requirements that exist outside the NPEC standards sphere. The new standard will augment the existing equipment qualification requirements for nuclear power generating stations. Additionally, NPEC is authoring a new standard to support the use of the risk-informed methodology in a multitude of applications as appropriate.

**Submitted by:** George Ballassi for Stephen Fleger

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