INTRODUCTION
The Traction Power Substations Standards Subcommittee (TPSSS) is in its fourteenth year of operation since it was formed in 2002. The TPSSS is working on developing new standards, recommended practices, and guides; coordinating with other organizations such as APTA and AREMA and within IEEE; providing up-to-date information on professional activities of interest to the electrified rail and transit industry; and soliciting recommendations, ideas and suggestions that would improve industry practices. The TPSSS is a subcommittee of the Rail Transportation Standards Committee (RTSC) within the IEEE Vehicular Technology Society (VTS). The TPSSS meets bi-annually at various transit properties in the United States and Canada. The TPSSS consist of electrified transit and railway industry leaders in the public and private sectors dedicated to writing national consensus standards, recommended practices, and guides which will govern manufacturing, supply, installation, testing, commissioning, and operation of traction power substation equipment.

PURPOSE
The purpose of this meeting was to update the TPSSS membership on status of TPSSS activities including Working Groups (WG) and Task Forces (TF), to share the progress of their work, to conduct working sessions, and to outline future plans for continuing their work on standards, recommended practices and guides.

GENERAL BUSINESS
Tuesday, September 27, 2016
Meeting called to order
Mr. Gary Touryan, the TPSSS Chair, welcomed all the attendees and encouraged them to participate actively. He thanked all the volunteers contributing to the WGs and TFs. On behalf of the IEEE, Mr. Touryan expressed his appreciation to LIRR for hosting September 2016 meeting.

LIRR Welcome Greetings
Mr. Joseph Conway, Assistant Chief Engineer Power, welcomed the participants.

On behalf of IEEE Mr. Touryan thanked Messrs. Rob Brooks, Executive Director, and Anthony Capobianco, Director, for their comprehensive presentation of the LIRR East Side Access Project. Mr. Touryan noted that this was the second time TPSSS was enjoying LIRR’s hospitality. The last time was nine years ago and it is great to see all the progress at LIRR.

IEEE VTS
Mr. David Thurston, VTS Vice President Land Transportation, thanked the members for voting for Professor Bih Yuan Ku for the VTS Board. He informed us that due to the efforts of our representatives on the VTS Board, funding is available for transit agency engineers to attend the TPSSS meetings. Mr. Thurston also called for papers for IEEE/ASME Joint Rail Conference (JRC) and invited participants to attend the JRC in Philadelphia, PA on April 4 - 7, 2017.
IEEE Membership
Mr. Touryan congratulated Mr. Sheldon Kennedy for being recognized as an IEEE Fellow for his contribution to our industry. Mr. Touryan also encouraged the attendees to apply for IEEE Senior Membership.

APTA
Mr. Touryan announced that Mr. Ethan Kim was elected to serve as the chair of the APTA Power, Signals, and Communications Technical Forum at the June 2016 APTA Rail Conference. Mr. Kim briefly outlined his plans to move forward with a new agenda. Mr. Touryan stressed that since most participants, in addition to being members of IEEE, are also active participants in APTA and AREMA, the TPSSS is able to communicate and coordinate effectively within the industry to achieve its goal of cohesiveness and consensus in the standards development process.

APTA is currently accepting abstracts for the 2017 Rail Conference. Abstracts are due Friday, November 4th. Access the materials for the 2017 Rail Conference call for abstracts here:  
http://www.apta.com/mc/rail/call/Pages/default.aspx

APTA is also looking for industry partners to assist with the development of research proposals for the Transit Cooperative Research Program (TCRP). Additional information for project requirements can be found here:  
http://www.trb.org/TCRP/TCRP.aspx

ELECTION OF TPSSS VICE CHAIR
Mr. Touryan informed of the resignation of Vice Chair Mr. Roger Avery, who has served the TPSSS for many years. Mr. Touryan pointed out that Mr. Avery actively participated at our meetings keeping all of us focused on the subject matter and sharing selflessly his wide range of experience not only in traction power but in systems engineering. Mr. Avery’s contributions to many WGs and TFs were most evident and valuable in formulating traction power standards with a clear understanding of systems integration.

Mr. Touryan opened the floor for nomination of a vice chair. Mr. Benjamin Stell was nominated for Vice Chair of the TPSSS and was unanimously approved.

Next meeting location and date
Mr. Touryan informed that the TPS and OCS Standards Subcommittees are coordinating to have the next meeting in May 2017 in Washington DC.

The Meeting Notes of the March 2016 meeting in New York were approved.

PatCom info
Prior to starting the WG/TF session Mr. Paul Forquer reviewed the mandatory PatCom information.

Working Group Reports

P1653.1-2016, IEEE Approved Draft Standard for Traction Power Transformers for Substation Application up to 1500 Volts dc Nominal Output
Vince Paparo – Chair
Ethan Kim - Vice Chair

Mr. Kim reported the following.
- Draft D12 was approved by RevCom in June 2016 and is officially a published standard.
This standard consolidates the requirements of C57.12.90, 91, 01 and 18.10 and tailors the design, manufacturing and testing requirements for TPS rectifier transformers.

Please specify this standard for rectifier transformers for traction power moving forward.

P1653.2-2009, IEEE Standard for Uncontrolled Traction Power Rectifiers for Substation Applications up to 1500 Volts dc Nominal Output

Benjamin Stell - Chair
Steve Bezner - Vice Chair

Mr. Stell reported the following.

- The current 1653.2 standard has been posted to IEEE TPSSC iMeet Central site in the 1653.2 “workspace”. The former ANSI C34.2 and NEMA RI-9 standards have been posted there as well for reference.
- We expect to be transitioning to iMeet for future work on this standard.
- Mr. Stell requested an updated list of working group member names and email addresses for invitations to iMeet Central 1653.2 workspace. Email them to him at rstell@septa.org.
- It was determined that the former ANSI C34.2 Table 6, “rectifier circuits and properties” does not need to be replicated in Std. 1653.2, since the same information is provided in Table 9 of IEEE C57.18.10, IEEE Standard Practices and Requirements for Semiconductor Power Rectifier Transformers.

P1653.3-2012, IEEE Guide for Rail Transit Traction Power Systems Modeling

Mark Pfeifer – Chair
David Hetherington and Andrew Jones – Vice Chairs

Mr. Hetherington reported the following.

- The PAR to update the standard to the new revision was approved on 5 July 2016.
- The PAR expires on 31 December 2020.
- The working group will be set up using iMeet and the first meeting will be before Christmas 2016.

P1653.4-2011, IEEE Standard for dc Traction Power System Field Testing and Acceptance Criteria for System Applications up to 1500 Volts dc Nominal

Kelvin Zan – Chair
Tom Young and Paul Forquer - Vice Chairs

- The sections on short circuit and vehicle start tests were rewritten, revised and tentatively accepted.
- At the next meeting, we need to start line by line from the beginning. Please have comments ready.

P1653.5 Recommended Practice for Controlled Rectifiers for Traction Power Substation Applications

Vince Paparo – Chair
David Groves and Vitaly Gelman – Vice Chairs

Mr. Vitaly Gelman presented a brief status review of the Recommended Practice, discussed specific topics including total versus inherent voltage regulation and power factor vs. reactive power, and proposed the following:

- Remove paragraph10, interphase transformers.
- Include additional paragraphs addressing general requirements, cooling systems, controller testing, firing pulse tests, calculations and studies prior to converter-transformer unit tests, converter-
transformer unit testing at high power test labs, and converter-transformer unit field tests. The additional paragraphs will be completed in time for the next IEEE TPSSS Meeting.

P1653.6-2013, IEEE Trial-Use Recommended Practice for Grounding of dc Equipment Enclosures in Traction Power Distribution Facilities

Ethan Kim - Chair
Paul Forquer - Vice Chair

The current document was published in 2013. The next deadline to reaffirm is 2023. The Working Group discussed recent updates for the proposed amendment.

- Shop Equipment Enclosure Grounding
  - TPSSS agreed that the same Device 64 enclosure grounding scheme that is installed on mainline substations, whether high or low resistance, should applied to shop substations as well.

- Multiple 64 devices
  - Heshem Elbarawy from WMATA posted a discussion on how WMATA implements their Device 64 enclosure grounding scheme.

- Floor Insulation for low resistance grounding (LRG)
  - Since the purpose of floor insulation in LRG schemes is only for equipment isolation for detection purposes (and not personnel safety), the installation extents should only be under the equipment plus 6 inches.
  - No change in installation extents for high resistance grounding (HRG).
  - Section will be reviewed by the WG on iMeet.

- Isolation of control electronics
  - TPSSC decided not to add a subsection on the isolation of control electronics. Some felt this is more a switchgear design issue.

- Railway Systems Grounding
  - Andy Jones (AECOM) developed and gave an update on the proposed outline for systems grounding.
  - The WG will post on iMeet and look for contributors to develop the standard.
  - Standard will cover everything from substation grounding to equipment grounding along the wayside.


Brian Gerzeny - Chair

Mr. Gerzeny presented a brief status review of this standard and discussed how to move forward with the IEEE Power Engineering Society (PES) to revise it. He recommended that we provide the PES with our comments and revisions at least 2 months prior to the next PES meeting so they can adequately review them and add us to their agenda. He also:

- Re-emphasized the need for at least 5 volunteers to accompany him to the PES meeting when we are ready to present our revisions.
- Discussed using iMeet for meetings with the WG going forward.
- Reviewed discrepancies in the existing standard concerning short time ratings.

TPSSC Website and iMeet Central=Central Desktop

Mr. Kim discussed the benefits of using the online based collaboration software for collecting standards development content from contributors, maintaining revision control, and providing a web space for informing committee members of schedule, recent project developments, and meeting times/locations. He presented the IEEE1653.6 iMeet website to the TPSSC as an example, and noted the following:
Members are encouraged to participate in IEEE working groups by requesting authorization from the respective chairs/vice chairs.

Mr. Hesham Elbarawy of WMATA will coordinate with the chair/vice chairs to continue the roll out of the new program throughout the WGs.

Wednesday, September 28, 2016
Meeting called to order & general information: Gary Touryan

**Working Group Reports, Continued**

**P1884, Guide for Stray Current/Corrosion Mitigation for dc Rail Transit Systems**
*Vish Mawley - Chair*
*Kelvin Zan, Bob Wilson, Edwin Wetzel – Vice Chairs*

Mr. Tom Young reported the following.

- The Task Force was created at the September 2012 Chicago TPSSS meeting.
- The PAR was requested on December 12th, 2012.
- The PAR was approved on February 1st, 2013 and Project Number (P1884) was assigned.
- Expected date of submission to the IEEE-SA for initial ballot was October 2015. Unfortunately, the progress has been slow. The projected completion date for submittal to RevCom is November 2016.
- The PAR expiration date is December 31, 2017.
- Chairs and vice chairs were unable to attend, so detailed discussions did not take place.
- It was generally agreed that the due date will have to be extended, and possibly the PAR.
- We need to consider limiting scope to corrosion from traction power only.

**P1887 Wayside Energy Storage System Guide for dc Traction Application**
*Salwa Fouda – Chair*
*Suresh Shrimavle and Ken Nutt - Vice Chairs*

Mr. Nutt reviewed latest table of contents, the expected timeline for balloting, and fielded questions that were mostly of a general nature pertaining to energy storage applications. He also noted the following:

- The PAR was approved in May 2013.
- Balloting was delayed due to unbalanced voter representation. Ms. Salwa Fouda is working with IEEE and registered voters to correct this.

**P2720 Rail Potential Management Guide for Direct Current Traction Electrification Systems**
*Benjamin Stell - Chair*
*David Hetherington Vice Chair*

Mr. Stell reported the following.

- The Rail Potential Task Force is now IEEE Rail Potential Management Working Group P2720.
- The current draft guide document Rail Potential Management Guide for Direct Current Traction Electrification Systems (Draft 5) has been uploaded to the iMeet Central P2720 Workspace.
  - Scope: This guide provides a description of the concepts, applicable standards, and methods used for the calculation and management of rail potential on dc-electrified rail transit systems.
  - Purpose: This guide describes existing methods, terminology, and additional references for the management of rail potential on dc-electrified rail transit systems.
• Draft D5 has some areas that need work in particular:
  o 8.3.1 Impact of passenger platform de-icing materials on touch & step voltages (proper procedures)
  o 8.3.2 Impact of platform edge doors on touch voltages (proper design)
  o 9.8 Passenger platform electrical isolation guidelines
  o 9.10 Analysis of impact of negative grounding devices on local and remote rail potentials via load flow simulation

• Working Group P2720 has the following members, each of which has been sent an invite to join the P2720 workspace in iMeet Central. Others who would like to join this WG should send an email to rstell@septa.org.

  Chris Kwong          Shoukat Ali         Andrew Jones
  Brandon Swartley    Shakti Sarai         Bill Brown
  Rick Straubel       Chen Zou             Shakti Sarai
  Vish Mawley         Birhanu Yazew        Dimitrij Greco
  Thomas Li           Ed Wetzel             Moises Ramos
  Mike Maziarz        Gustavo Cevallos

**TF on Smart Substations**
**Mark Curry - Chair**
The Smart Substation TF reported that, for the foreseeable future, the TF would present relevant speakers and papers on Smart Substations and related topics. Mr. Curry stood in for the planned speaker and presented a summary of several papers on Cybersecurity. The works and papers of the TF will be maintained on iMeet.

**Adjourn the second day of the meeting**
Prior to adjourning, Mr. Touryan thanked Mr. Conway and his staff for arranging every detail to accommodate a group of close to 100 participants. Also special thanks to Mr. Gus Orphanides for leading the site tour of the Engineering Systems Operations facility. Mr. Touryan stated that the support provided by LIRR to our volunteers is truly appreciated and makes our meeting successful. Most importantly, LIRR participation in the discussions of our Working Groups and Task Forces enables the WGs and TFs to benefit from the wealth of their experience and knowledge obtained working for so many years at the LIRR.

**LIRR Facility tour of the Engineering Systems Operations (ESO) was conducted by Messrs. Joseph Conway and Gus Orphanides.**

**Thank you to the meal sponsors!!!**

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