IEEE Traction Power Substation Standards Sub-committee Meeting
On Tuesday, March 29 and Wednesday, March 30, 2016
at the Yale Club - 50 Vanderbilt Avenue New York, NY 10017

Meeting Minutes

Hosted by Metro-North Railroad (MNR) - Metropolitan Transportation Authority (MTA)

INTRODUCTION
Traction Power Substations Standards Subcommittee (TPSS) is on the fourteenth year of operation since it was formed in 2002. TPSS 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 rail and transit industry; and soliciting recommendations, ideas and suggestions that would improve the industry practices. The TPSS is a subcommittee of the Rail Transportation Standards Committee (RTSC) within Vehicular Technology Society (VTS). TPSS meets at regular intervals during the year at various transit properties in United States and Canada. TPSS consist of transit and rail industry leaders in 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 for the Working Groups (WG) and Task Forces (TF) to share the progress of their work, to conduct working sessions, and outline their future plans on continuing their work on the standards, recommended practices and guides.

Tuesday, March 29, 2016

Meeting called to order
Mr. Gary Touryan, 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 MNR for hosting March 2016 meeting.

MNR Welcome Greetings
Welcome remarks were presented by Mr. John Kesich, SVP, Operations, Glen Hayden, VP, Engineering, and James Pepitone, Director, Power Systems of the MNR.

On behalf of IEEE Mr. Touryan thanked Messrs. John Kesich and Glen Hayden for sharing MNR’s accomplishments and plans, encouraging their staff to actively participate and contribute to WGs and TFs, and pointed out that their support on the behalf of the MNR is important factor in motivating IEEE volunteers to serve Rail industry trough professional societies.
IEEE VTS
Mr. David Thurston, VTS Vice President, Land Transportation encouraged the members to vote for Bih Yuan Ku on the VTS Board. He informed that due to the efforts of our representatives on the VTS Board funding is available for Transit Agency engineers to attend the TPSS meetings. Mr. Thurston also invited participants to attend the Joint Rail Conference in Columbia, SC, April 12 - 15, 2016.

APTA
Mr. Eugene Reed, APTA Program Manager gave an informative presentation on APTA’s Standard Development Process.

AREMA
Mr. Robert Walker gave a briefing on AREMA Committee 33 activities and encouraged participation. Mr. James Gillies mentioned the importance of coordination between IEEE, APTA and AREMA Standards development.

P1653.1 Standard Practices and Requirements for Traction Power Rectifier Transformers
Mr. Ethan Kim reported:
1. Draft D10 was submitted back in Oct 2015 for a 20-day recirculation.
2. D10 came back with only editorial comments related to normative references.
3. Draft D11 was submitted for recirculation in Feb 2016.
4. D11 had a 95% approval rating, but came back with formatting comments related to figure references.
5. Draft D12 corrected the figure references has been submitted for the 3rd recirculation.
6. Recirculation expires on April 5th.
7. The draft is expected to pass and be ready for publication.

P1653.2 Standard for Uncontrolled Traction Power Rectifiers for Substation Applications
Published on January 22, 2010 Chair Ben Stell and Vice Chair Steve Bezner

Mr. Ben Stell reported:
The following potential modifications to the next edition of the standard were discussed.
1. Paragraph 11.2.2, Field Tests, currently states “IPT field testing is addressed in rectifier unit field testing.” However, Std. 1653.2 does not contain a section for rectifier unit field testing. It was decided to delete this sentence, since no need for a field test procedure for interphase transformers could be identified.

2. Paragraphs 11.3.7 and 11.3.8 begin with “If a rectifier is being procured separately…” It has been noted that the meaning of this sentence is not clear, and may be open to misinterpretation. It was decided to modify these two paragraphs to begin as follows: “If a rectifier is being procured separately (that is, without a rectifier transformer)…”

3. Paragraph 11.4 currently reads as follows (italics):

   The large size and high overload rating of traction rectifiers generally makes testing at full voltage and power impractical. Testing with the rectifier dc output short circuited can provide a method to determine the parameters necessary to calculate full voltage performance and capability, but it cannot provide any direct
data applicable to actual operation. Therefore, when a rectifier unit is specified, its performance and capability shall be determined from calculation by parameters determined for the individual components by the methods described in this and other pertinent standards. These components shall include the transformer, rectifier, and interconnections when inherent regulation is specified. When total regulation is specified, these components shall also include source characteristics.

As an option, a rectifier unit “package test” or “in-line test” test may be performed on a completely assembled rectifier unit, including rectifier transformer, rectifier, and interconnecting bus ducts, assembled in line. If specified, the specifier shall describe the quantities to be measured and define the calculation methods and criteria.

It was decided to delete the words “As an option” at the beginning of the second paragraph.

The following suggestions were also provided for consideration in the next edition of the standard.

- Consider including the “rectifier circuits and properties” table that was in the back of ANSI C34.2 in the standard (it could be included as an informative annex)

**P1653.3 Use Guide for Traction Power Systems Modeling**

Published July 11, 2012 under Chair Mike Dinolfo and Vice Chair Mark Pfeiffer. Currently the Chair is Mark Pfeifer and the Vice Chairs are David Heatherington and Andrew Jones.

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

Messrs. Tom Young and Paul Forquer lead the discussion.

The document was published on October 31, 2011. The train start and short circuit testing was discussed and the relationship between the two. Mr. Tom Young is writing a revision for circulation at a later date.

**P1653.5 Recommended Practice for Controlled Traction Applications**

A new PAR approved in 2014.
Finalized draft 2016.
Planned for balloting 2016.

**P1653.6 Recommended Practice for Grounding in Systems Supplying Direct Current Traction Power**

Mr. Ethan Kim reported:

1. Document was published in 2013. Next deadline to reaffirm is 2023.
2. New topics for 2023 will include Shop enclosure grounding, floor and wall insulation for low resistance grounding, and isolation of control electronics mounted on dc control panels.
3. The working group agreed that an amendment should be issued to the current document for the addition of the new topics rather than wait for the reaffirmation deadline.
4. The working group also initiated a motion to start another task force for “Systems Grounding”.
5. The working group is looking for members to assist with the development of the “Systems grounding” standard.

**C37.14 Standard for Low Voltage dc Power Circuit Breaker Used in Enclosure**

Mr. Brian Gerzeny reported:
1. Chuck Ross announced that C37.14-2015 has been issued
2. Reviewed the impact that TPSS had in creating this revision
3. Noted that there was more work to do on the standard from TPSS viewpoint (in particular with some of the more complex technical topics)
4. Next Steps
   a. Brian to get comment sheet out to entire TPSS group soliciting comments on C37.14-2015
   b. Brian to organize review(s) of comments with WG and commenters
   c. Brian produce marked up version of C37.14-2015 taking into account all comments received.
   d. Brian to contact PES and try to get on agenda for Fall Meeting
   e. TPSS will bring 5-10 people to Fall PES Meeting to present our revised C37.14-2015

**iMeet Central=Central Desktop  Manage files/collaborate on line**

Mr. Hesham Elbarawy reported:

- Hesham Elbarawy introduced iMeet Central to the TPSS subcommittee and it’s working groups - iMeet Central is an etool provided and supported by IEEE-SA for the standard development working groups. It establishes a common platform for the WGs to communicate and contribute outside the subcommittee bi-annual meeting.
- Benefits of using iMeet central include maximizing the time allowed for discussion, have all contributions and documents in one centralized location, and helps WG members to catch up with ongoing and closed topics.
- Gary Touryan the chair of the subcommittee indicated that the plan is to slowly migrate into using this new system.
- iMeet central consists of a Public area and multiple private workspaces. The Public area which show general info about the Subcommittee is partially developed, but the site is active can be accessed thru this link [https://ieee-sa.imeetcentral.com/TPSS/](https://ieee-sa.imeetcentral.com/TPSS/)
- Private workspaces were created for 10 Working groups and 3 Task Forces and ready for their use.
- Email invitations will be sent out to the WG chairs to create their login credential and start adding members, upload files, draft standards and collaborate.
• Hesham mentioned that he can provide an online walkthrough showing the basic features of iMeet central next IEEE meeting.

**Wednesday, March 30, 2016**

**P1887 Guide for Wayside Energy Storage Systems for dc Traction Applications**

Mr. Suresh Shrimavle reported:
The Working Group continues meeting via conference call meetings. P-1887 (Draft D9) which is 90% complete and was circulated among the TPSS Sub-Committee members twice; first in Jan 22, 2016 and secondly in third week of March, 2016 (prior to Metro North NY meeting) with no major comments received on the Draft. A brief discussion took place on March 30, 2016 at IEEE Metro North, NY on the guide with mutually agreed on rearranging and formatting the contents. WG has 52 members and few expressed interest in joining. As a path forward continue with conference call meeting/s and intent is to circulate the Final Draft to the sub-committee before the ballot; our goal is to send the draft for ballot by May 2016.

**P1884 Guide for Stray Current/Corrosion Mitigation for dc Rail Transit System**

Mr. Bob Wilson reported:
Project Milestones
Task Force was created Fall 2012 in Chicago IEEE TPSS Sub-committee Meeting.
PAR was requested on December 12th, 2012
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 and we may have to revise the date.
Projected Completion Date for Submittal to RevCom November 2016.
PAR Expiration Date December 31, 2017

Progress on Draft
Initial Table of Contents was presented to the WG in the IEEE TPSS Sub-Committee Meeting in Denver in May 2013.
The technical aspects of the guide were discussed in Houston in October 2014 and in San in Jose 2015.
Periodic Conference Call meeting are being held to discuss the subject.
The progress has been too slow. Need active participation from WG members.
The scope and purpose will always be kept in mind as required by the IEEE-SA Standards Board.

**Task Force on Rail Potential**

Mr. Ben Stell reported:

• A draft document has been developed called *Rail Potential Management Guide for Direct Current Traction Electrification Systems (Draft 4)*
• 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: At present there are no standards, codes or guide documents in North America that define the permissible limits and management of rail-to-ground voltages (rail potential) for rail transit systems that are powered by direct current (dc). This guide describes existing methods, terminology, and additional references for the management of rail potential on dc-electrified rail transit systems.
• Project Authorization Request (PAR) was sent to the IEEE on 3/29/2016 (guide draft is due March 2018)
• Task Force formation will occur after PAR has been approved
• Some draft topics need to be completed

Current Members of Task Force

Chris Kwong                      Shoukat Ali
Brandon Swartley                Shakti Sarai
Rick Straubel                   Chen Zou
Vish Mawley                     Birhanu Yazew
Thomas Li                       Ed Wetzel
Mike Maziarz                    Gustavo Cevallos

TF on Smart Substations

Mr. Mark Curry reported:
The TPSS Smart Substation Task Force’s current purpose is to identify relevant technology topics and standards topics for the Transit Industry that addresses the DC Traction Power application. This Task Force will write white papers on topics relevant for this segment of the industry. Eventually the Task Force will write a guide.

IEEE standards for AC Utility substations are evolving and seeking stabilization. In general, this group will monitor the IEEE efforts for the AC Utility substation and present white papers on how to adapt these standards for the Transit application.

The TPSS Smart Substation Task Force is reviewing the following topics to present a paper to IEEE TPSS in the fall. Additional topics, if presented, will be considered.

• Benefit of IED vs Conventional Relays
• Defining the Design Differences between AC Utility Substation and DC Traction Substations
- Identify any pending legislation that would require the use of IED’s or greater monitoring and control
- Overview of applicable existing standards and protocols for use in TPSS applications
- IEEE defined interface and functions for protective relays. (The Agencies want to be able to swap vendor hardware)
- Industry Cyber Security Terms

The TPSS Smart Substation Task Force plans to use the IEEE collaboration tool.

Adjourn the second day meeting
Prior to adjourning Mr. Touryan expressed special thanks to Mr. Pepitone for taking care of every detail to make our meeting successful in a beautiful venue overlooking Grand Central Terminal, accommodating the ever growing list of the attendees (at the last count 130 on Tuesday), organizing a unique tour of the “original” traction power substation in Grand Central Terminal, and most importantly participating in the discussions of our WG and TF sharing the wealth of his experience and knowledge obtained working for so many years at the MNR

Grand Central Terminal Tour was organized and led by James Pepitone

New York City Transit Power Control Center Tour was organized and led by Robert Schmitt of NYCT Associate Chief Electrical Officer.

Next Meeting
Next Meeting will be on September 27 & 28, 2016 at the Long Island Railroad’s Hillside Facility, in Queens. If you plan on staying in Manhattan you can take LIRR train to Hillside Maintenance Facility.
Special Thanks to Metro North Railroad for arranging and providing the meeting space and arranging a tour of Grand Central Terminal.

Thanks to New York City Transit for the tour on their Control Room.

Special Thanks to our Meal Sponsors:

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