**INTRODUCTION**

Traction Power Substations Standards Subcommittee (TPSSC) is on the thirteenth year of operation since it was formed in 2002. TPSSC 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 TPSSC is a subcommittee of the Rail Transportation Standards Committee (RTSC) within Vehicular Technology Society (VTS). TPSSC meets at regular intervals during the year at various transit properties in United States and Canada. TPSSC 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 continue their work on the standards, recommended practices and guides.

**Meeting Opened by Gary Touryan**

Welcome remarks and presentation by Vern Hartsock, Maryland MTA Deputy Director
Engineering & Construction

**VTS Vice President, Land Transportation**

Mr. David Thurston

Positions available in VTS and Standards association

The Joint Rail Conference, IEEE, ASME, ASCE, 2016 is IEEE sponsorship year

Board of Governors meetings

VTS Website may offer resources to TPSC

Local Chapters

**APTA Director, Technical Services**

Louis Sanders

Mr. Sanders gave a briefing on APTA activities. He also announced that APTA was moving their office.

**Next Meeting**

The next meeting will be sponsored by Metro North Railroad and include a tour of Grand Central Station. The dates are March 29-30. The OCS meeting is March 31 – April 1.
P1653.1 Standard Practices and Requirements for Traction Power Rectifier Transformers
Vince Paparo/Ethan Kim

- Standard was updated to the latest IEEE formatted template.
- Standard was recirculated on October 6, 2015 and closed October 26, 2015.
- Approval of standard is still pending the results of the recirculation.

P1653.2 Standard for Uncontrolled Traction Power Rectifiers for Substation Applications
Ben Stell/Steve Bezner

The following updates to the current 2009 standard were addressed; Please provide comments to Benjamin Stell and Steve Bezner.

1. Paragraph 11.2.2, Field tests, states “IPT field testing is addressed in rectifier unit field testing.”
   - Std. 1653.2 does not contain a section for rectifier unit field testing.
   - The only language currently addressing field tests for rectifiers is paragraph 11.4.5, Field dielectric tests.
   - Recommendation: add a section for rectifier field tests and include test procedures for interphase transformers. If agreed, what additional field tests should be included? (Please provide comments).

2. Paragraphs 11.3.7 and 11.3.8 begin with “If a rectifier is being procured separately...”. It has been noted that this sentence is not particularly clear.
   - Recommendation: change these two paragraphs to begin as follows: “If a rectifier is being procured separately (that is, without a rectifier transformer)...”.

3. ANSI/EIA-282-A, Standard for Silicon Rectifier Diodes, has been superseded by JEDEC Standard 282B.01, Silicon Rectifier Diodes
   - Recommendation: Update the normative references to include JEDEC Standard 282B.01

4. Paragraph 11.4, Rectifier Unit Tests, currently reads as follows:

   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 has been reported that some manufacturers are referring to the second paragraph to take exception to agency specifications that require an “in-line test”. This is not the intent of the second paragraph.
- Recommended changes for discussion:
  A. Modify the second paragraph to clarify that the in-line test is an acceptable alternative when specified by the user. Providing typical quantities to be measured and calculation methods and criteria in the standard is also recommended.
  B. Permit testing to be waived if a rectifier unit of the same design has been successfully tested within the past five years (The precise meaning of “same design” would need to be clarified).

P1653.3 Use Guide for Traction Power Systems Modeling
Gary Touryan
The guide was published on July 11, 2012.
WG looking for input from the new members to update the guide.

P1653.4 Standard for dc Traction Power System Field Testing and Acceptance Criteria for System Applications up to 1500 Volts dc Nominal
Kelvin Zan
Tom Young
Paul Forquer

P1653.5 Recommended Practice for Controlled Traction Applications
Vince Paparo - Chair
David Groves and Vital Gelman joined the WG as co-chairs.

P1653.6 Recommended Practice for Grounding in Systems Supplying Direct Current Traction Power
Ethan Kim
The following issues should be addressed in the next revision to P1653.6:

- Shop grounding
- Low Resistance Grounding floor wall insulation
- Mounting of low voltage components

C37.20.1 Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
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Ted Burse

Reported that C37.20.1 was approved by the IEEE SASB March 26, 2015, Published July 2015, Active until March, 2025, Next Revision Slated for ~2021

Task Force on Rail Potential
Ben Stell

A draft document has been written called Guide for Rail Potential Management for Direct Current Traction Electrification Systems.

- Draft Guide 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.
- Draft Guide 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.

If there is sufficient interest, this draft guide could be developed into an IEEE standard. A Working Group needs to be established before a Project Authorization Request (PAR) for a new standard can be sent to the IEEE.

Current Task Force members are:
- Chris Kwong
- Thomas Li
- Brandon Swartley
- Vish Mawley
- Rick Straubel

The following offered to join the Task Force at this meeting:
- Mike Maziarz (Burns)
- Gustavo Cevallos (Lea + Elliott)
- Chen Zou (HNTB)
- Shoukat Ali (HNTB)
- Shakti Sarai (Calgary Transit)
- Birhanu Yazew (WMATA)
- Ed Wetzel (STV)

Benjamin will move forward with setting up an IEEE Rail Potential Working Group, and will circulate the current draft to Task Force members. Benjamin can be reached at rstell@septa.org.
Task Force on Smart Substations
Mark Curry

The Smart Substation Task Force provided an overview of a possible technical problem to solve. The current problems the Task Force has been asked to address include the following:

1. The use and specifying of either an open or closed protocol SCADA systems.
2. Generic interoperability of IED’s for protective relaying - The IEEE TPSS group has existing standards which define the ANSI functions. The existing standards were written with the expectation that electromechanical devices would be implemented. Interfaces between devices were typically as specified DC voltage to a terminal strip or adjacent device. When IED’s are used to replace electromechanical relays, varying protocols and media types are provided by the industry which need to be coordinated at the time of design. The Task Force understands there is a need for a generic standards based design which can support a staged implementation over time without the need to use converters or proprietary hardware for future enhancements.
3. The term Smart Substation does not have a formal definition. In lieu of attempting to provide a formal definition, the Task Force may elect to identify the functionally within the Smart Substation concept to bring some common terminology to the approach.

The Task Force Chair requested individuals to work on the Task Force. The following individuals volunteered:
   1. Lucius Thompson – Kapsch
   2. Steve Halford – SEL
   3. Richard Fetsick – SEL
   4. Samuel Vidyasagar – Kapsch
   5. Paul Iannacone – Kapsch
   6. Matthew Gibbons - Gannett Fleming

C37.14 Standard for Low Voltage dc Power Circuit Breaker Used in Enclosure
Brian Gerzeny/Chuck Ross

- Reminded the group of the issuance of the new version of the standard
- Presented a sampling of the major changes in the new release of the standard
- TPSS to consider writing an Addendum to the new release of the standard
- The old working group is reinstituted and some new volunteers added
- Working group to put together a plan for getting an Addendum created. This will involve continued working together with PES.
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PC37.20.8 Standard for Metal-Enclosed Low-Voltage (3200V and below) Direct Current Power Circuit Breaker Switchgear for Traction Power Applications
David Groves
This project has been disbanded.

P1887 Guide for Wayside Energy Storage Systems for dc Traction Applications
Suresh Shrimavle/Ken Nutt

Here is a brief summary of discussions on P1887 Guide for Wayside Storage Systems for DC Traction Applications at Baltimore IEEE TPSS meeting on Oct 21, 2015.

“WG continuously worked via conference call meetings on a regular basis to discuss the input provided. All sections are populated with the input provided in the working Draft. Presented to the TPSS group the Table of Contents (TOC) and open discussion took place, noted the comments/suggestion with positive remarks which will help to rearrange some of the contents within the document. A working Draft will be completed by the end of 2015 and released to the TPSS group. WG will have its 1st conference call meeting after 3 weeks of draft release; thereafter continue meet via monthly conference calls.”

P1884 Guide for Stray Current/Corrosion Mitigation for dc Rail Transit System
Kelvin Zan/Bob Wilson

The PAR for the work was prepared in December 2012 and approved as P1884 in February 2013. The projected completion date for submittal to RevCom is November 2016. The PAR expiration date is December 31, 2017.

Presently the Working Group membership totals about 40 people. Progress on the Guide has been slow. An initial table of contents was presented in May 2013 and technical aspects were added by October 2014. A fairly large draft document has been developed. A limited number of people have contributed to the draft. There have been some new people asking to join the working group. We need to translate that into people writing and reviewing various sections of the guide.

Issues for discussion;

Microbiologically Induced Corrosion: Early in development process this was dropped from consideration as it is not DC Stray Current related. As this can be a major concern for some agencies, especially those with dry standpipes, a question has been raised as to how it can be covered in the Guide? There was a suggestion that perhaps it could be covered in an Annex, but there was no consensus.
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Negative Grounding Devices: This will be removed from major discussion in the Guide as it will be covered in other Guides or Standards.

The WG Chair intends to release the Draft in the near future to the general WG membership for comment and review. It is hoped additional people will volunteer to work on the various sections. It was suggested that coordination teleconference calls should be implemented.

Coordination with NACE and other agencies that have standards would be useful.

Formation of Task Force on Low Level DC Faults
Ed Rowe through his work on the Transportation Research Board (TRB) has requested our committee consider the formation of a Task Force to investigate Low Level DC Faults. This will be discussed at the next meeting. The product would be a Recommended Practices or Design Guide.

MTA Site Tour

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