Approved by General Counsel

TR-14 Meeting Report

Date(s): 07/19/2016 - 07/20/2016

Location: Boston

Approved: 08/15/2016

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July 19, 2016

TR-14 Structural Standards for Communication and Small Wind Turbine Support Structures Engineering Committee
(http://www.tiaonline.org/all-standards/committees/tr-14)

Meeting Report

Date:	July 19, 2016
Time:	8:30-17:30
Meeting Location:	Courtyard Boston Downtown 275 Tremont Street Boston, MA 02116
Meeting Room:	**Empire Ballroom**
Chair:	John Erichsen, PE, SE
Vice Chair:	Mark Malouf, PE
Secretary:	Bryan Lanier, PE, SE
TIA staff:	Marianna Kramarikova

The chairman read TIA Important Notice of Notice of Participation

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1. Administrative/General Business

1.1 Call to Order

1.2 Attendance (Call Quorum, Introductions, Roster)

- Introduction of Chairman, Vice-Chairman, Secretary, Steering Committee and TIA staff
- Attendance Taken for Quorum (One company, one vote – section 5.2.2 ECOP)
  - Quorum met
- Introduction
- Meeting Roster sign in code: 2092

- Distribution and Numbering of Documents
  TR-14 email reflector address: tr14@tiacomm.org
  TR-14 FTP site: http://ftp.tiaonline.org/TR-14/

1.3 Meeting Agenda Review and Approval

- Meeting Agenda July 19, 2016
- Motion to approve the meeting agenda: Scott Kisting
- Second: Jim Kyriacopoulos
- Discussion/Objections: None
- Motion Approved

1.4 Meeting Report Review and Approval

- Meeting Report March 29, 2016
- Motion to approve the meeting report: Scott Kisting
- Second: Mark Malouf
- Discussion/Objections: None
- Motion Approved

1.5 TIA Intellectual Property Rights (Early Disclosure Policy)

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1.6 Chair's Report and General Items

1.7 TIA Report and General Items

1.8 Update on ANSI/TIA-1019-A, TIA-222-G, TIA-222-G-1 Reaffirmation

2. New Business

2.1 TIA TR-14 Leadership

- Discussion of term – 2 years, with election / potential re-election following for both Chair and Vice Chair positions
- Motion for re-election of John Erichsen for Chairman: Scott Kisting
- Second: John Wabha
- Discussion / Objections: None
- Motion Approved, John Erichsen elected as Chairman, TR-14

- Motion to re-elect Mark Malouf for Vice-Chairman: David Brinker
- Second: William Garrett
- Discussion / Objections: None
- Motion Approved, Mark Malouf elected as Vice-Chairman, TR-14

- TIA has received support from American Towers for Bryan Lanier to continue to serve the committee in a Secretary role

2.2 Disposition of ANSI/TIA-1019-B

- Motion to withdraw ANSI/TIA-1019-B: James Ruedlinger
- Second: David Brinker
- Discussion / Objections: None
- Motion Approved

2.3 Disposition of ANSI/TIA-1019-A-1

- Motion to withdraw ANSI/TIA-1019-A-1: James Ruedlinger
- Second: David Brinker
- Discussion / Objections: None
- Motion Approved

2.4 Disposition of Technical Bulletin, Mount Classification

- Update and review of contributions
- Motion to initiate a new project Technical Bulletin Mount Classification : David Hawkins
- Second: Chris Ply
- Discussions / Objections: None
- Motion Approved
- Motion to open a 30 day TIA ballot for Mount classification: David Hawkins
- Second: Chris Ply
- Discussions / Objections: None

- Motion Approved
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- Chairman assigned the work on bulletin to be done in TR-14 TG 3 - Ad Hoc 13 non-formulating group
- Michelle Kang was appointed to be the chair
- The chairman seek additional participation to join the TG 3 - Ad Hoc 13 group – if interested contact Michelle Kang, Mark Malouf and Marianna Kramarikova.

2.5 Task Group 7 – ANSI/TIA-322

- TIA provided an overview of ANSI/TIA-322 ballot summary. Ballot summary and comment resolution were uploaded to the FPT site for review. All comments were addressed successfully.
- Disposition of ANSI/TIA-322
- Motion to publish ANSI/TIA-322 Standard: Scott Kisting
- Second: Peter Chojnacki
- Discussions / Objections: None
- Motion to publish ANSI/TIA-322 standard approved

2.6 TIRAP Telecom Tower Safety Equipment Manufacturers Committee

- Update was given by Jeremy Buckles, Joey Deuer and Robert McCoy
- 4 Specific Goals / Targets of Committee:
  - Written, explicit direction on maintenance, installation, inspection of a Safe Climb System
  - Common vernacular for components
  - Clear Compatibility of sleeves between various climbing facility manufacturers
  - Uniform identification and labeling of Safe Climb System
- Goals of Shunt Meter updates are as follows:
  - Consistent accuracy and guidelines for shunt type tension meters
  - Methods for accuracy across multiple manufacturers
  - All manufacturers have agreed to common scope and definitions
  - Field tests have been agreed to by manufacturers
  - Initial tests have been completed with very positive results regarding accuracy and consistency.

2.7 Task Group 6 – International Building Code Liaison

- Spiro Soukis commented on progress with IBC
- Rough draft of ANSI/TIA-222-H to be submitted for initial review on July 22nd
- Initial submittal deadline has been extended through September 1st for more complete, revised copy

2.8 Step Bolt Standard Climbing Facility and Pole Drag Coefficients

- David Brinker commented on the need to develop a standard, industry wide step-bolt for specification Procurement documents
- Specific details, like dimensions, material grades, and installation locations on different tower types was provided
- Specific loading criteria and energy absorption was also introduced
- Standard diameter was proposed as 0.75 in, but this was changed to 0.625 in
- Intent of this addition was to provide typical standard for new towers. Use of this standard would not ensure existing step bolts have to be replaced, what is in place remains acceptance assuming conformance with design standard in place.
- David Brinker commented on harmonization of ANSI/TIA-222-H standard with AASHTO Pole standard.
- In general, for supercritical wind flow, 16 sided poles will see slightly higher drag coefficients.
- Inclusion of drag coefficients for bare poles to be included in Revision ANSI/TIA-222-H.

2.9 Task Group 3 – ANSI/TIA-222-H

- Mark Malouf provided a progress report on the development of ANSI/TIA-222-H
  - Revision 3 draft has been completed in July 2016
  - Final draft for editorial review to be completed August 2016
  - Draft for balloting to be completed December 2016
  - Publication date scheduled for April / May 2017
  - 14 combined Ad Hoc Groups
  - 17 Sections have been / are being reviewed
  - 18 Annexes have been / are being reviewed
  - 6 Sections / Annexes completed and reviewed by Steering Committee
  - 6 Sections / Annexes identical to Revision G – Considered Complete
  - 8 Sections / Annexes remain in progress
  - 15 Sections / Annexes have been reviewed by Steering Committee, updated draft after comments has been provided and Steering Committee needs to complete follow-up comments
- Ad Hoc 3.1 – Loading
  - Chaired by Madison Batt
  - Gust factors for monopoles to remain consistent with Revision G
  - Update to drag coefficients to consider linear appurtenance impacts on the leeward and windward sides of the poles, not just outside the pole diameter
  - Updated drag coefficients to be included for square and rectangular HSS in the force coefficients table for appurtenances

- Update of topographic methods to include method introduced by SEAW and provide 3 method:
  1. Method 1 – Simplified, consistent with method in Revision G
  2. Method 2 – Rigorous, consistent with method introduced by SEAW
  3. Method 3 – Site Specific Procedure
- Ground elevation factor (K_e) introduced and will be applied directly to the design pressure equation
- Risk Categories received significant attention and discussion of definition is ongoing.

- Ad Hoc 3.2 – Analysis
  - Chaired by Peter Chojnacki
  - Guyed masts meeting and exceeding 250 ft in height must be modeled using cable elements. Modeling as a non-linear spring will not be allowed.
  - Gross member properties may be used when creating model cross-sectional properties.
  - Geometric imperfections must be included into the model if the applied model windspeed is less than 30 mph. If the applied lateral loads use windspeeds equal to or exceeding 30 mph, modeling of geometric imperfections is relaxed.
  - Partial yielding of a cross-section for tower sections is determined not required and can be ignored as part of the global stability matrix of the model.
- Ad Hoc 3.3 – Strength
  - Chaired by Ping Jiang
  - Most change proposals discussed during the Las Vegas meeting have been approved (e.g. HSS wall thickness, built-up members, single angle strength, etc.)
  - Introduction of flexural torsional requirements for double angle members
  - Update to Anchor Rod Strength, to match interaction equation from AISC 360-16
  - Continued discussion on monopole slip splice strength with additional work left to conclude on what the minimum design specification should be
- Ad Hoc 3.4 – Sections 5 – 8
  - Chaired by Bryan Lanier
  - No significant additions / changes from Las Vegas meeting
- Ad Hoc 3.5 – Foundations / Grounding
  - Chaired by Ken Gilbert
  - Clarification provided in Section 9.3 regarding site investigations and site specific geotechnical reports
  - Greater detail regarding application of strength reduction factors, specifically as applied to dead loads and soil strengths which derive resistance from overburden
  - Concrete standard updated to ACI318-14

- Drilled piers / caissons are to be analyzed as rigid when the shaft length / diameter ratio ≤ 6. Drilled piers / caissons with ratios greater than 6 are to be modeled as flexible.
- Additional options noted for equivalent restraint for seismic loads (i.e. reinforced concrete beams, slabs on grade, confinement by rock, or dense cohesive or granular soils)
- Scope change for grounding and removed reference to primary and secondary ground
- Definition for electrical impedance updated and removed 10 Ω plus measurement
- Clarification to follow IEEE 1692-2011 for grounding design, plus advice on general guidelines

- Ad Hoc 3.6 – Markings & Climbing
  - Chaired by Scott Kisting
  - Clarification regarding climbing facility intent added to Scope
  - Definitions updated to provide harmony with ANSI A10.48, z359 and the CFR 1926
  - Comments added regarding safety sleeve and contractor communication when impacting climbing path
  - Strength requirement changes included changing hand rail term to support rail, removal of step bolt requirements in deference to TIA Standard Step Bolt
- Ad Hoc 3.7 – Sections 13 & 14, Annex J, K, N & O
  - Chaired by Raphael Mohamed
  - (3) new Annexes for New Tower Construction (N), Existing Tower Modification (O) and Monopole Base Weld Check (P)
  - Updates to Section 13 include commentary on plumb and twist measurements for monopoles (not required after installation)
  - Update to Section 14 includes removal of 1 year inspection interval for flagpoles
  - Update to Annex J includes new and improved criteria for various aspects of tower inspection
- Ad Hoc 3.8 – Existing Structures
  - Chaired by Chris Ply
  - Emphasis removed for feasibility structural analysis, changed “Analysis” to “Review.” Rigorous placed in front of Feasibility in the code.
  - Foundation design reaction comparison allowed in specific circumstances for rigorous structural analysis, specifically when details about the foundation can only be generated through destructive testing
  - Guidance for assumed material properties provided in Annex R
  - Expansion of modification verification requirements
  - Demand / Capacity ratios for existing structures with changed conditions to be extend limit to 105%

- Changed conditions from previous code standards allowed up to 10%, with maximum limit of 105%

- Ad Hoc 3.9 – Installation & Procurement
  - Chaired by Tim Drumm
  - Updated to reflect installation per ANSI/TIA-322 and ASSE A10.48
- Ad Hoc 3.10 – Small Wind Turbine
  - Chaired by Ronnie Glover
  - Fatigue design criteria changed to specific values of 140 mph, ultimate windspeed, Exposure C and Topographic Category I. Change in importance based on importance factor, not varying windspeed
  - Illustrative examples of good weld practice provided
  - Updated some definitions with AFL terminology
- Ad Hoc 3.11 – County Listing / ATC & USGS Website
  - Chaired by John Erichsen
  - Funds needed to provide wind + ice design values and frost depths from the Applied Technology Council have largely been generated
  - In discussions with ATC to commence work, although response times have been sluggish
- Ad Hoc 3.12 – Seismic
  - Chaired by Bryan Lanier
  - Equivalent Lateral Force Procedure has been updated to mimic equations from ASCE7 exactly (e.g. development of C_s, not V_s)
  - Rayleigh Method introduced as alternative (and inferred preferred) method for determining natural frequency of the structure
  - Inclusion of Overstrength Factors (Ω) and Upper Strength Limits (R_y and R_t) for anchor bolts
  - Inclusion of Redundancy Factor (ρ) for other tower components
  - Method 2 (Equivalent Modal Analysis Method) will be removed as a design consideration, as well as Time History Analysis
  - Equivalent Lateral Force Procedure or Modal Analysis will equally be permitted as an alternative for seismic analysis of structure
  - All exception rules are eliminated, although seismic analysis will not be required for Risk Category I structures
  - Language commenting seismic detailing for steel structures not being required has been added. Concrete detailing will be addressed in Section 9.0.
- Ad Hoc 3.13 – Mount
  - Chaired by Michelle Kang
  - Comments added regarding definition of a changed condition requiring a mount analysis
  - Specific note added engineer of record for the tower analysis can be different than the engineer of record for the mount analysis
  - Seismic load cases, including vertical seismic load effects, have been added

- Commentary on appropriate R values for seismic analysis included
- Commentary on mount connection to the tower with respect to fixity has been added
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- Ad Hoc 3.14 – Monopole Reinforcing
  - Updates given on Scope, Definitions, Symbols, Notations, Analysis Methods, Design Strength, Connections and Anchorage
  - Analysis methods include elasto-plastic (for some compact and non-compact sections) and fully plastic (for compact sections)
  - Additional commentary provided on construction methods, installation and inspection

3. New Topics

3.1 Motion to Amend Meeting Agenda for July 19, 2016 and include disposition of ANSI/TIA-222-H

- Motion to amend meeting agenda: David Hawkins
- Second: Scott Kisting
- Discussion / Objections: None
- Motion Approved

3.2 Disposition of ANSI/TIA-222-H

- Motion to open ANSI/TIA-222-H for industry 45 day ballot: Peter Chojnacki
- Second: David Hawkins
- Discussion / Objections: None
- Motion Approved

3.3 Corrosion Risk Assessment, Cathodic Protection and Corrosion Mitigation for Galvanized Anchors / Towers

- Presentation by Dr. Mehrooz Zee

4. Upcoming Meetings

- First quarter 2017 likely next meeting, locations still being discussed (Dallas, New Orleans, etc.)

5. Adjournment

- Motion to adjourn: Jim Kyriacopoulos
- Second: David Brinker
- Discussion / Objections: None

- Motion Approved

This meeting was conducted in accordance with the TIA Legal Guides and the engineering procedures.

TR-14 Attendance
(07/19/2016 - 07/20/2016)

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NOTES:

1.) A * denotes an attendee that has manually entered their information into the system and may not be currently in the TIA membership database.

2.) A [V] after a name denotes an attendee that has attended this meeting virtually.

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