Approved by General Counsel

TR-14 Meeting Report

Date(s): 10/29/2014 - 10/29/2014

Location: Raleigh Durham, North Carolina

Approved: 01/16/2015

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Telecommunication Industries Association (TIA)
Standards and Technology Department
Engineering Committee Report
Committee Meeting
For TR-14 (http://www.tiaonline.org/all-standards/committees/tr-14)
Structural Standards for Communication and Small Wind Turbine Support Structures

Date: October 29, 2014

Location: Embassy Suites – Raleigh / Durham / Research Triangle Park
201 Harrison Oaks Boulevard
Cary, NC 27513

Attendants:		
	John Erichsen, Chair,	EET, LLC
	Mark Malouf, Vice-Chair	Malouf Engineering International
	Bryan Lanier, Secretary	American Tower Corporation
	David Brinker, Editorial Committee	Rohn Industries
	John Wahba, Editorial Committee	Turris
	Stephen Yeo, Editorial Committee	Rohn Products International Arabia
	Marianna Kramarikova, Manager	TIA
	Greg Burbage	4SE, Inc.
	Marcus Benson	Aero Solutions
	Benjamin Ude	Aero Solutions
	Raphael Mohamed	American Tower Corporation
	Scott Vance	B&T Engineering, Inc.
	John Kelly	B&T Engineering, Inc.
	Michael DeBoar	Bennett and Pless
	Pankaj Taneja	Bentley Systems
	Apurba Tribedi	Bentley Systems
	Ping Jiang	Black & Veatch
	David Kuhn	Black & Veatch
	Ernie Jones	Consolidated Engineering, Inc.
	Richard Cullum	Crown Castle
	Jamal Huwel	Crown Castle
	Joseph Kim	Crown Castle
	Aaron Poot	Crown Castle
	Jim Kyriacopoulos	Crown Castle
	Doug Pineo	Crown Castle
	Ahmet Colakoglu	Destek Engineering, LLC
	John Robinson	Electronics Research, Inc.
	Joel Deis	Engineering Specialties Group
	Kyle Evans	Engineered Tower Solutions

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	Christopher Ply	FDH Engineering, Inc.
Attendants:	Dennis Abel	FDH Engineering, Inc.
	Ta-Wen Lee	FWT, LLC
	Matthew Baker	GlenMartin
	Chris Martin	GlenMartin
	Chad Burton	GPD Group
	Kyle Davis	GPD Group
	Dan Palkovic	GPD Group
	Jibril Shehu	GPD Group
	William Griswold	GTS
	James Conner	Jacobs Engineering
	Lance Cooke	Morrison Hershfield
	Scott Kisting	MUTI
	Barry Bayless	National Steel Erectors
	Jordan Maxson	Nello Corporation
	Hasan Reza	Paul J. Ford & Company
	David Hawkins	Paul J. Ford & Company
	Martin Piercey	Pier Structural Engineering Corporation
	Brian Reese	Reliapole Inspection Services
	Carlo Franceschino	Sabre Industries
	Keith Tindall	Sabre Industries
	Thomas Taylor	Semaan Engineering Solutions
	Dave Anthony	Shenandoah Tower Service, Ltd.
	Adam Jones	Shively Labs
	Alan Plummer	Shively Labs
	Blaine Eichmann	Sioux Falls Tower
	Chris Cullinan	SMBH, Inc.
	Albert Schmidt	SSC
	Michell Miller	SSOE Group
	Ismaias Recinos	SSOE Group
	Gregg Fehrman	Stainless LLC
	Jean Lecordier	TCI
	Jeffrey Kirby	Tectonic Engineering
	Antonio Gualtieri	Tectonic Engineering
	Kavish Zawar	Tectonic Engineering
	Madison Batt	Tower Engineering Company
	Ronnie Glover	Tower Engineering Professionals
	William Martin	Tower Engineering Professionals
	Peter Chojnacki	Tower Numerics
	George Kouba	Tower Technology
	Scott Haines	Union Pacific Railroad
	Jeff Grassman	Valmont Communications
	William Heiden	Valmont Industries
	Avery Fann	Vertical Solutions, Inc.
	Michael Lassiter	Vertical Solutions, Inc.
	Daniel Blakeman	Vertical Structures

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Attendants:	Timothy Drumm	W-T Communication Design Group
	Leslie Freeman	W-T Communication Design Group
	Jim Walker	Walker Engineering, Inc.
	Simon Weisman	Weisman Consultants
	James Ruedlinger	Worldwide Communications Consultants

1. Administrative

1.1 Call to order, Started at 8:00 AM

- TIA Sign-in Code = 8015.

1.2 Attendance (Call quorum, Introductions, Roster)

- Introduction of Chairman, Vice-Chairman, Secretary, Manager and Steering Committee.
- Attendance was taken electronically.
- Quorum Taken and Achieved.

1.3 Meeting Agenda Review and Approval

- Meeting Agenda October 29, 2014
    - Contribution number TR-14-2014Oct29-001
    - First motion to approve: Scott Kisting
    - Second motion to approve: Doug Pineo
    - Motion approved unanimously

1.4 Intellectual property rights (Early disclosure policy)

1.4 The chairman read the TIA IPR statement, as found in the TIA Standards Development Procedures. Participants in the work of the the TR-14 are urged to review this policy. Participants were encouraged to notify TIA of any patents of which they are aware that are related to the practice of TIA publication early in the development of the TIA document to reduce the possibility for delays in the development process and increase the likelihood that the draft TIA publication will be approved for publication. The chair asked if there was knowledge of patents, the use of which might be essential to any documents being considered by TR-14. None were identified.

1.5 Distribution and Numbering of Documents

- TR-14 email reflector address: tr14@tiacomm.org
- TR-14 FTP site http://ftp.tiaonline.org/TR-14/TR-14_MAIN/

- Please note that the login credentials for the TIA TR-14 FTP server are on the TIA Committee Member Tools Dashboard at > standards >committees > committee members tools login > your committee member tools dashboard.

1.6 Meeting Report Review and Approval

- Meeting Report May 6, 2014
  - First motion to approve: George Kouba.
  - Second motion to approve: Mark Malouf.
  - Motion approved unanimously.

1.7 TIA Report and General Items

- Marianna Kramarikova brought to the attention of TR-14 participants that this year TIA celebrates the 55th anniversary of the nation's first standard providing guidance in the design of communications towers which initially started as project RS-222. TIA appreciates the committee support and all those hours participants committed to develop ANSI/TIA-222 standard. 55th Year of RS-222 (http://www.tiaonline.org/all-standards/committees/tr-14)
- New CEO of TIA, Scott Belcher (http://www.tiaonline.org/news-media/press-releases/tia-names-scott-belcher-ceo)
- 2 Participants left TR-14/TIA
- 15 Participants joined TR-14/TIA
- Digital Video Library (http://www.tiaonline.org/all-standards/committees/tr-14)
- Training Manual
- FAQ for TIA-222-G & TIA-1019 (http://www.tiaonline.org/standards_/committees/documents/TIA%20TR14%20FAQ%20Instructions_R1%20(1-29-2013).pdf)

2. Old Business

2.1 ANSI/TIA-222-G-3 – Baseplate

- Dave Brinker reviewed all ballot comments.
- Baseplate thickness concern, addressed through consistency with AASHTO.
- Approved language within Addendum to make clear alternate methods, assuming consistency ANSI/TIA-222-G loading criteria, are acceptable and comment that method is not normative, only suggestive.
- First proposed motion to approve ANSI/TIA-222-G-3 for an industry publication: Dave Hawkins

- Second motion to approve ANSI/TIA-222-G-3: Jim Kyriacopoulos
- There were no comments or objections to this motion.
- Motion for ANSI/TIA-222-G-3 to go for publication was approved unanimously.

2.2 ANSI/TIA-222-G-4 – Small Wind Turbines

- Dave Brinker reviewed all ballot comments, specifically what a Mast Supporting Structure is, Category II, fatigue of connections, ports (consistency with ASCE/AASHTO lighting, limited to 1 in thickness) and stiffener stress range on baseplates based on elastic distribution.
- First proposed motion to approve ANSI/TIA-222-G-4 for an industry publication: Mark Malouf
- Second motion to approve ANSI/TIA-222-G-4: John Wabha
- There were no comments or objections to this motion.
- Motion for ANSI/TIA-222-G-4 to go for publication was approved unanimously

3. New Business

3.1 Update and Future of ANSI/TIA-1019-A and ANSI/TIA-322

- John Erichsen commented that goal is to transition TIA-1019-A into a new standard called TIA-322.
- TIA-322 will become the engineering standard that TIA-1019-A meant to encompass.
- Ernie Jones introduced A10.48, which is sponsored by ASSE, that will become the means and methods standard that TIA-1019-A meant to encompass.
- First proposed motion to approve ANSI/TIA-1019-A to industry ballot: Scott Kisting
- Second motion to approve ANSI/TIA-1019-A to industry ballot: Ernie Jones
- There were no comments or objections to this motion.
- Motion for ANSI/TIA-1019-A to industry ballot approved unanimously
- First motion to open ANSI project for TIA-322: Ernie Jones
- Second motion to open ANSI project for TIA-322: Scott Kisting
- There were no comments or objections to this motion.
- Motion to open ANSI project for ANSI/TIA-322 approved unanimously

3.2 OSHA and Telecommunications Industry Registered Apprenticeship Program (TIRAP)

- http://www.tirap.org/
- Joint Venture sponsored by Department of Labor, with efforts from TIA, OSHA and others.

- Scott Kisting spoke at length regarding the interest OSHA has in the wireless industry regarding construction and maintenance of telecommunication towers and wireless equipment.
- Idea in principle is to provide a training program through which foremen / crews are qualified to perform various levels of advanced tasks of construction and maintenance on towers which in turn provides the tower owner hiring the specific crews with specific levels of competence. Need for this is a direct result of increasing accidents occurring in the workspace.
- Intent is to promote planning, training and adherence to already published codes (ANSI/TIA-1019-A) and future codes (ANSI/TIA-322 & A10.48).
- 2013 resulted in 13 fatalities.
- 2014 to date has resulted in 11 fatalities.
- TR-14 editorial group will be publishing white papers regarding this topic in the future.
- First motion to have TIA be represented on TIRAP board: Scott Kisting
- Second motion to have TIA be represented on TIRAP board: William Griswold
- ***Motion to have TIA be represented on TIRAP board approved unanimously***

3.3 International Building Code Representative

- John Erichsen commented on the need for TIA representation at IBC meetings.

3.3.1 New Representatives

- The following individuals/groups volunteered for this activity:
    - American Tower Corporation
    - Valmont
    - Crown Castle
    - Bentley Systems

3.4 ANSI/TIA-222-H Update

- The chairman of the TR-14 Task Group on ANSI/TIA-222-H Mark Malouf introduced objectives and roles of various task groups.
- Noted Annex for topography, mounts and potentially fatigue.
- Commented on Timelines for completion of TIA-222-H (Spring 2016).
- 11 total task groups
- Over 50 change proposals to date.

3.4.1 Task Group 1 – Loads, Madison Batt

- 3 Major changes for ANSI/TIA-222-H
  - Load Factors
  - Exposure
  - Topography
- 1.6 Load factor goes away as ultimate wind speeds are used in place of 50 year reoccurrence wind speeds.
- Provided additional options for topographic evaluation of a site (SEAW method).
- Removal of importance factors for wind.
- Change of exposure definitions to be consistent with ASCE7-10, which includes evaluation of surface roughness.
- Discussion entailed of the inclusion of Exposure E, which is meant to infer a site specific exposure, as opposed to a code recommended exposure, has been used. Doug Pineo noted this may lead to confusion amongst reviewing officials and recommended the exposure be renamed "Site Specific." The task and editorial group took this comment under advisement and will debate further.
- Drag coefficients for ultimate vs. nominal design windspeeds were discussed, with the idea that potentially lower load could be applied to the tower at an ultimate design windspeed based on potentially lower drag coefficients. David Brinker commented this was this was the goal, to create a more realistic wind loadings at high wind speeds and what is listed in ANSI/TIA-222-H would be consistent with methods suggested in ASCE7-10.
- Question was raised by Adam Jones if default wind speeds listed on antenna technical specification sheets should be changed / recommended with the conversion to ultimate design windspeeds. The editorial committee commented back that this is the responsibility of the antenna manufacturer to choose an appropriate published wind speed and lateral force value in conjunction with their client base.

3.4.2 Task Group 2 – Analysis, Peter Chojnacki

- Significant changes include additional codification / commentary on stability verification through 2nd order analysis, specifically through consistency on analysis and design assumptions.
- Provided additional comments regarding non-linear elastic supports vs. cable elements in guy tower modeling.

- Chapter will follow AISC360 for stability, specifically following Direct Analysis Method and inclusion of notional loads.

3.4.3 Task Group 3, Design Strength of Steel, Ping Jiang

- Lots of notational updates.
- Use of AISC360 from previous AISC LRFD 99.
- Section regarding u-bolt design is still under review.
- David Hawkins suggested ANSI/TIA-222-G-3 should be listed as an Annex in TIA-222-H, which was agreed upon by the committee.
- Ta-Wen Lee asked question if ANSI/TIA-222-G-3 was informative or normative. Answer from committee was informative and not the only option for evaluating anchor bolts and baseplates.
- Question of TIA-222-H using nominal vs. design thicknesses was posed. Answer is for lower yield stresses (Fy ≤ 52 ksi), nominal thicknesses are to be used.
- David Brinker spoke in detail regarding the updated F_{cr} and ϕ calculation for single angles. Intent is to follow research used in ASCE10 for single angle design and analysis, whereas current AISC specification conservatively follows these design procedures. This design criteria is to adhere to single angle 60 and 90 shapes, for both tower leg and brace members.

3.4.4 Task Group 4, Manufacturing, Other Structural Materials, Guy Assemblies and Insulators, Bryan Lanier

- Inclusion of A1085 as a prequalified steel.
- Commented on changing of pre-stressed to pre-stretching in a number of places.
- Question was raised regarding insulator design that will be looked into further by task group.

3.4.5 Task Group 5, Foundations, Anchorages, Protective Grounding, Christopher Ply

- Limitations have been set on aspect ratio of drilled piers in defining rigid vs. flexible behavior.
- Editorial committee commented on “Every effort must be made” language and asked for rewriting of specific section.

3.4.6 Task Group 6, Obstruction Marking and Climbing Facilities, Scott Kisting

- Definitions of various climber abilities have been added.
- Comments added to ensure the contractor is responsible to confirm climbing facility is safe and adequate.

3.4.7 Task Group 7, Plans, Assembly Tolerances and Marking, Maintenance and Condition Assessment, Raphael Mohamed

- Comments added about mounts, post modification inspections, guy wire tension measurements.
- Additional commentary regarding construction inspections, specifically with respect to special inspections from the International Building Code.
- Wording added regarding plumb and twist.
- Additional commentary regarding climbing facilities.

3.4.8 Task Group 8, Existing Structures, Christopher Ply

- Feasibility structural analysis has been redefined, now called a structural review.
- Comparison of original design reaction to current reactions can be used in some instances.
- Assumption of various steel grades is reasonable, although adding an Annex for the definition and identification of aged steel is recommended.
- Updated reference to TIA-1019 to TIA-1019-A

3.4.9 Task Group 9, Installation, Procurement and User Guidelines, Tim Drumm

- Comments regarding post installation inspection to be added.
- Comments regarding soil type if presumptive soils are used are to be added.

3.4.10 Task Group 10, Small Wind Turbine Support Structure Design, Ronnie Glover

- No significant change from Addendum 4 other than number of illustration additions.

3.4.11 Task Group 11, US County Listing, Wind Speed Conversion and Design Criteria Maps, Peter Chojnacki

- Potential elimination of tables in ANSI/TIA-222-H
- Did speak with Applied Technology Council about adding wind plus ice map criteria to ATC website for wind. This is possible, although funding would have to come entirely from TIA, or some sponsorship through TIA.

3.5 Fatigue and ASCE7-16, Dave Brinker

- Question was posed if fatigue requirements should be extended to telecommunication monopoles. Representatives from Crown Castle (Jim Kyriacopoulos) and American Tower Corporation (Bryan Lanier) commented that their respective inspection programs had not revealed significant fatigue related concerns with respect to typical monopoles up to this point.

Main concern was related to slender masts supporting canisters mounted on top of tubular poles (e.g. cylindrical stealth spines).

- Conclusion was Annex should be created to address cylindrical stealth spines.

3.6 Seismic, Dave Brinker

- Discussion was opened regarding number of changes in seismic loading from ASCE7-02 to ASCE7-10.
- Specifically, new Ss and S1, version of analyses methods and application of overstrength factor to tower design / analysis.
- Bryan Lanier has agreed to chair a Task Group to cover the changes in ASCE7-10's loading of structures for earthquake loading and asked for volunteers.

3.7 Mount Classifications, Dave Brinker

- Method for determining mount allowable load was presented.
- Method for classifying mounts and mount categories was also presented.
- All will be listed as an Annex in ANSI/TIA-222-H.

3.8 ASCE7-16 Wind, Seismic and Ice Maps, Dave Brinker

- USGS and ATC websites will be approved as sources of data for designs.
- For wind design, ASCE7-16 will have more contours, greater areas of special wind regions and include functions to account for air density at high elevations.
- Additional criteria that will have to be looked at is wind speed up effects for roof mounted structures as well as tornado criteria.
- For ice design, 1 map with risk categories will still be used. There will be some change in contours and the 2.0 limit state conversion will be taken out as this will be applied to the ice thickness directly.

3.9 Spanish Edition of TIA-222-G, Bryan Lanier

- Close to completion, should have complete by the end of this year.

4 New Topics

- Acceptable overstress (Chapter 35 of the International Building Code).
- Plumb and twist for monopoles.
- U-bolt design and analysis.

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5 Adjournment

- First motion to adjourn the meeting: Jim Kyriacopoulos
- Second motion to adjourn: David Hawkins
- Motion for adjournment approved unanimously

This meeting was conducted in accordance with the TIA Legal Guidelines found in the TIA Procedures for American National Standards