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Approved by General Counsel

TR-14.7 Meeting Report

Date(s): 11/10/2009 - 11/11/2009

Location: Pittsburg, PA

Approved: 03/25/2011

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COMMITTEE CORRESPONDENCE

TELECOMMUNICATIONS INDUSTRIES ASSOCIATION (TIA)
Standards and Technology Department
Meeting Report
Subcommittee TR 14.7 - Steel Antenna Towers and Antenna Supporting Structures
November 11, 2009

Hilton Garden Inn, Southpoint
Canonsburg, PA

(66) Present

TR14.7 Subcommittee Meeting: Wednesday November 11, 2009

8:10 am Brian Reese – Opening of Meeting. Review of meeting Agenda

8:11 am Stephanie Montgomery –

- TIA Introduction, Internationalization(see attendance roster)
- Review of TIA membership
- Voting Eligibility

8:15 am Stephanie Montgomery – Review of Notice of Participation/Intellectual Property

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8:20 am Brian Reese – Introduction

8:28 am Old Business – Intro Brian Reese

- Structural Reliability Task Group Summary – Bill Griswold [See Power point]
  - Monopole Fatigue - Active
  - Fall Radius - Active
  - Corrosion - Active
  - Falling Ice – In queue
  - Materials – In queue
  - Fabrication practices – In queue
- Base Plates
  - Address comments
  - …. See Power Point
  - Targeted for completion at next meeting

8:35 am Brian Reese - Review of status of Addendum 2

Dave Brinker – Is the addendum approved by TIA? It is a TIA document, but it is not formally published. It is an approved by TIA. It cannot be purchased until ANSI approval is completed. The approval of the addendum is projected to occur by the end of November.

8:40 am Brian Reese – Reaffirmation of TIA-222-G and TIA-222-G AD1.

Motion to reaffirm – Simon Weisman, 2nd by Mark Malouf – 100% approved.

8:43 am Brian Reese – Reaffirmation of EIA-250-C 1990

- Will drop ANSI approval.
- TIA will work to find a new home

Motion to reaffirm – Motion to reaffirm John Erichsen, 2nd by Adams Jones- 100% approved

8:45 am Election of Officers

Motion to approve Brian Reese as Chair – Motion to approve Mark Malouf, 2nd – 100% approved

Motion to approve John Erichsen as Vice chair – Motion to approve Simon Leland, 2nd John Wahba- 100% approved

8:50 am John Erichsen - FAQ site

9:00 am John Erichsen – Revision G vs Revision H

9:05 am John Erichsen - Candidates addendum/revision H

See sheets and PPT

- Broadcast antenna degradation issues – submitted by Ernie Jones and John Robinson - Chaired by ERI
- Schifflerized angles – Submitted by Robinson – Send Editorial committee
- Section 2.6.6.2 – Submitted by Beard – Combine into general topography review Chaired by Brinker/Leland
- Effective area behind escarpment – 8x to 16x - Combine into general topography review Chaired by Brinker/Leland
- Additional safety anchorages for pole climbing - Submit by Bicknese - Combine into general Safety and Anchorage review chaired by Simon Leland and Adam Jones

- Ratings for antenna mounts (T-booms) – Submitted by Snyder - Combine into general Safety and Anchorage review chaired by Simon Leland and Adam Jones
- Tower grounding/NEC – Submitted by Yeo – Chaired by Steven Yeo
- ASCE – wind/ice/seismic changes – Submitted by Brinker – Editorial committee with assistance by main committee volunteers.
- AISC 13th Edition (Black Book) – Submitted by Brinker – Send Editorial Committee
- Topography – Direction of wind speed up – Submitted by Leland - Combine into general topography review Chaired by Brinker/Leland
- Geometric method for determining guy tension – Submit as white paper – Chaired by Simon Weisman
- Anchor bolt corrosion – Submitted by Erichsen – Chaired by John Erichsen and Simon Leland
- RFC responses – Assigned Editorial Committee
- Gust response factor of structure vs. structure stiffness – Chaired by JohnWahba and Mark Malouf
- Manufacturer qualifications – Submitted by Peter Moskal – Chaired by Peter Moskal – A White Paper candidate with a Electronic Survey to follow

9:20 am Dave Brinker – Small Wind Power [see Brinker presentation]

- Chris Martin – Incorporate IEC approaches where possible.
- What is small wind? 200 m^2 rotor area
- The discussion about the role of TIA as a developer of a Wind Energy Standards was very active. A number of questions dealing with the appropriateness of TIA as the sponsor of the topic included:
  - Should the topic be driven by ASCE, AWEA, IEC?
  - Is AWEA seeking assistance or a relationship with TIA TR14.7?

The Vice Chair suggested the issue should be divided into two task groups

1. Technical – Development of technical solutions Chaired by Dave Brinker – Tasked to the Editorial group
2. Liaison – Charged with the development of the correct path towards publication, i.e. Solely by TIA, Joint with AWEA, ASCE… Chaired by Chris Martin, Assisted by Adam Jones, Jean Lecordier, Jim walker, Tom Hoeninger, Dave Brinker

Motion to approve the formation of a technical task group Bill Griswold, 2nd by Simon Leland- 100% approved

Motion to approve the formation of a Wind Energy Liaison task group Bill Griswold, 2nd by Doug Pineo – 100% approved

10:25 am Requested Volunteers to assist in Wind Energy Liaison – Chaired by Chris Martin

10:26 am Stephanie Montgomery – Role of TIA in developing joint international standards.

10:30 am Dave Brinker – Fatigue [See presentation]

The topic is considered a concern within the Communications industry, while the application of wind energy will result in greater structural sensitivity to fatigue loading, the issue is not exclusive to this application. Thus, the formulation is considered an independent initiative.

Concerns: Impact upon existing structures, added computation burden, qualitative vs. quantitative problem?

Motion to add to the Reliability Task Group: Madison Batt, 2nd by Simon Weisman. Bill Griswold will merge into the Structural Reliability Task Group (SRTG) and as such will set the prioritization within the list of SRTG topics.

10:45 am Mark Malouf - Dynamic Gust Response [See presentation]

How will this work impact current gust response factors? That is the goal of the review, no conclusions at this time. The product of this effort will be a Change Proposal that will be reviewed by the Editorial Committee.

11:00 am Patrick Warr (President) & Edward Nezic Insulators (Engineering Manager) –
Mr. Warr provided a general overview of Austin Insulators (History, organization, type of insulators, product functions (mechanical and electrical).

Mr. Nezic – Discussion of engineering issues.

- Two categories of base insulators – Guyed Masts and Self Supporting Towers
- Important to consider both the mechanical and electrical aspects.
- Two categories of guy insulators – Fail-Safe (Ball, Egg or compression) and Non-Fail Safe (Rod Type or Safety Core)
- "Currently revision G has two classifications. The classifications are broad, but the classifications need additional classifications"
- Revision F vs. Revision G vs. CSA S37-01. Revision F was less onerous. The introduction of revision G lead to stricter load capacity limitations and required proof loads. In tension, the proof loading is less of an issue. In compression and shear this can create manufacturing issues. In the past the manufacturer controlled the capacity definition. As a result, Austin would like to see more continuity between the definition of revision G capacities and historic capacity (FS). There is a need to reinvestigate the application of phi values, etc. The result of current TIA-222-G applications is a heavier insulator. Similarly, the classification of shear capacity is a bit nebulous. Austin's practice has been to publish a maximum working load. Revision G is publish a design strength x 0.4. Similarly, the application of proof loads to compression applications can create difficulties. Historically, the proof loading is 1.2 times the WLL. The current TIA requirement increases the proof load resulting in placing the insulators under risk of failure during the proof loading process. In summary, insulators are a varied product. The standard should address these variations.

1:15 pm ERI – Ernie Jones TIA 1019 summary

Mr. Jones summarized the current state of TIA 1019. Summary followed the sections order listed within the proposed standard.

2:05 pm Minjuan He – Introduction of China Engineering Construction Standard [Presentations]

Types of standards

1. National Standard (GB 50009-2001, GB 50011-2001, …
    a. Compulsory (similar to building codes) and non-compulsory portions
2. Local Standard – Local government also establishes local standard to augment deficiencies o the national standard. (Shanghai building code) Includes local issues that are impacted by local conditions, e.g. soft soil in Shanghai. Both compulsory and Non-compulsory (recommendations) sections are included.
3. Industry Standard – Created to address equipment and working conditions within the industry. It is an industry specific, e.g. electricity transmission. No compulsory portion in industry standard. Works as a guideline for the industry. Implies compliance without compulsory requirement.
4. Association Standard – Standard for steel is an example. It is non-compulsory. Elective use.

Standards are created on a 10 year cycle unless changes are deemed important. In these cases changes can be issued more frequently.

There is an established program for the introduction of standards.

1. Application
2. Project establishment
3. Draft discussion and modification
4. Obtain opinions.

2:25 pm Fang-Lin Wang – Discussion detailing how the tower designs are created. The government is a dominate factor in the standard development. Initially, the standard process was modeled after the Russian model. More recently, it is modeled after the United States and European approach. The China design standards find their origins in the high rise structure design standards. The china standard use a 10 minute wind. It also uses deflection limits to cover a number of design issues. For example, the deflection limitations are based upon 2.5% of the structures height.

2:35 pm Professor Ma – Study on New Flange and Foundation in Wind Power Tower – The design is under patent in china and has applied within the United States. Included in the presentation was unique wind tower flange connection design, foundation configurations for hard to soft soil. The pole connection was tested under static and fatigue loads. The connection was subjected to 10,000,000 fatigue load cycles. The result of the design change was a

more cost effective design. Similarly, the foundation design resulted in a reduction in the concrete volume used to install the foundation. The pole section supported a 750 kW generator. To date the design has been installed at nearly 200 sites. The resulting foundation design changes resulted in a significant cost savings.

- Was there an increase in labor in comparison with the material cost? There was an increase in labor, but the material savings more than offset the labor cost increase. In China, the labor costs are not significant. The foundation design resulted in a reduction in the installation time.
- Is the concrete mixed on site? The concrete is trucked to site from the mix plant.

3:00 pm Professor Ma and Professor He Presented by Professor He – Research and design of High rise Structures in China.

There is a long history of tower construction in China. Every Buddhist temple has a tower. In on province a 38m brick tower was constructed in 532 AD. Given this history, the construction of towers are intended to accommodate TV, Communications, broadcast, etc. The towers are constructed a multi function structures. As part of the presentation, a number of the completed and planned structures were depicted. The height of the structures ranged from approximately 1000' to 2000'. The structures tend to be more architecturally driven. They are built of both steel and reinforced concrete. The trend is leaning towards steel. The taller structure (2000 ft.) structure was a composite design. The resulting flexible structure required deflection limitations and acceleration. This necessitated the installation of large dampners. The dampner was constructed using a large water tank restrained using a number of methods. The penalty is a reduction in area available for occupancy. As part of the confirmation of the dampner requirements, a cable was attached to the structure and cut to determine the reaction of the structure. Another focus of the design process is the impact of seismic loads. There are a number of research projects used to access the impact of seismic loads upon the structure. The result of the research is a targeted review of specific areas of the structure, .i.e. the portions of the structure that are composed from horizontal cantilevers. Another concern is the large temperature variations as a result of seasonal changes. The result is alterations of connections to allow more movement of the connections.

- Did the design of the structures include the use of Wind tunnel testing? Not every structure was reviewed utilizing wind tunnels.

3:25 pm New Business

The next meeting will be in the spring/summer of 2010. The location is to be announced.

If you would like a CEU certificate, please email Brian Reese or John Erichsen

3:30 pm Motion to adjourn – Bill Griswold, 2nd Dave Hawkins- 100% approved

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Adjournment

The meeting was conducted in accordance with the TIA Legal Guides and the Engineering Manual.

End of Report

By: John R. Erichsen, P.E., S.E. – TR14.7 Vice Chairman & Secretary

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