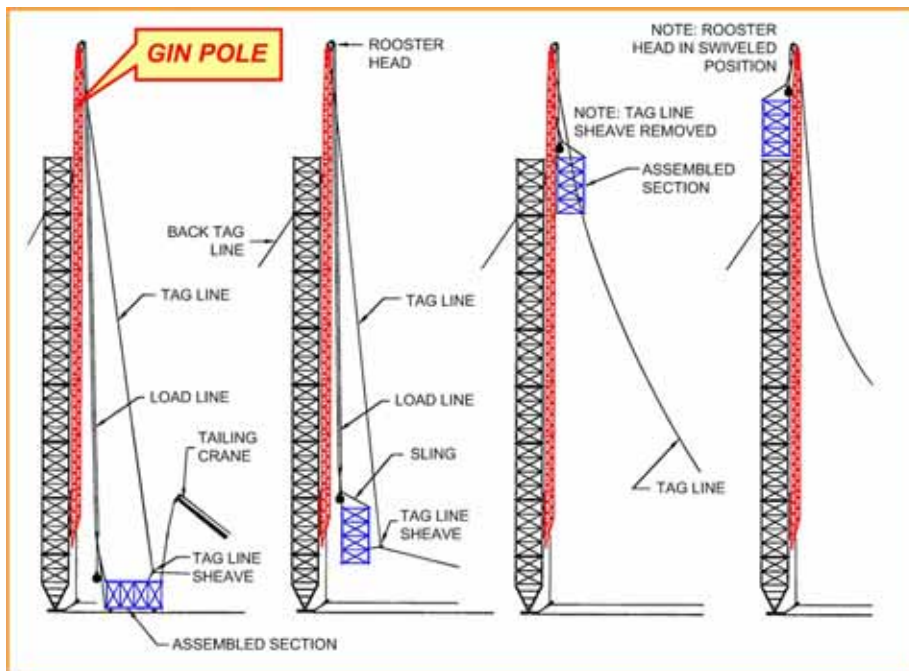




## New Antenna Construction Standard Nearing Completion

Broadcast towers can be magnificent structures and are a vital part of the broadcast industry infrastructure. While tall towers in particular can be beautiful to look at and are engineering marvels, the fact is their construction is at times perilous and great care must be taken in order to build them safely. A new antenna construction standard is being developed by the Telecommunications Industry Association (TIA, Arlington, VA, [www.tiaonline.org](http://www.tiaonline.org)) with the goal of improving tower construction safety and preventing future construction accidents and structure collapses.

An earlier standard, developed in 2004, forms the basis for this new work. Engineers at Electronics Research, Inc. (ERI, Chandler, IN, [www.eriinc.com](http://www.eriinc.com)) along with a special core group of other experienced industry engineers and construction specialists worked for 5 years to develop a standard entitled "Structural Standards Used for Installation of Antenna Towers and Antenna Supporting Structures," with the designation of ANSI/TIA-1019. This earlier standard focused on the use of lifting devices called "gin poles" (see figure for an illustration of how gin poles are used in tower construction).



This new standard will be titled "Structural Standards for Installation, Alteration and Maintenance of Antenna Supporting Structures" and will also be labeled as ANSI/TIA-1019. It will contain all past information which exists in the current TIA-1019 "gin pole" version with the following new material added:

- Section on special construction considerations unique to towers;
- Complete section of design loading for construction equipment and structures;
- Specifics for complete rigging plans.

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Within TIA, Engineering Committee TR-14 (Point to Point Communications Systems) is the group developing this new standard, in a Subcommittee designated TR-14.7, Structural Standard for Antenna Supporting Structures and Antennas. TR-14 is responsible for standards and recommended practices related to terrestrial fixed point-to-point radio communications equipment and systems (microwave radio), primarily in the frequency bands above 960 MHz. Ongoing work has been going on with this standard since 2004, and the Subcommittee is hopeful it will be released formally to the industry within the next 6 to 12 months.

One specific issue that is addressed in the new Standard is that of guy wire slippage. Many times during construction, guys are pulled out and temporarily connected until they can be adequately secured in their final connection devices, sometimes with unfortunate results as shown in the picture below. Sometimes connections that can slip must be used for efficient construction methods. In the event this is the case, guidelines are provided in the Standard for the following:



- Methods to analyze the structure for a slippage event including impact factors to apply for either continuous slippage or instantaneous release are provided;
- In the event a structure cannot safely handle the potential of guy slippage or other unequal structure forces guidelines on how and where to provide temporary backup guys is fully covered;
- Annex E of the Standard, entitled “Wire Rope End Connections,” will provide specific data on connections typically used in our industry that have been known slip as well as non-slip type connections. Acceptable methods of end termination of connections are covered;
- An option to the use of temporary guy lines is given by adding in a backup system if slippage, that can be detrimental to the tower, can occur during a construction procedure.

Additional topics covered by the new Standard include suggested methods of providing temporary bracing when replacing tower members, deteriorating analysis for existing structures, safe hoist anchorage, load testing requirements and options prior to making lifts, monitoring of loads and gin pole deflection during lifts, special engineered lift provisions, and use of capstans and synthetic rope.

This new Standard was discussed in a session at this year’s NAB Broadcast Engineering Conference (BEC, April 18-23, 2009, Las Vegas, Nev.) entitled “*Towers and Transmission Systems Part II*” by Don Doty, President, Stainless LLC, North Wales, Pa., and Ernie Jones, PE, Senior Engineer, ERI, Chandler, Ind. Mr. Jones is also co-chairman of the TR-14.7 Subcommittee developing the Standard; Mr. Gordon Lyman is the other co-chair (thanks to Mr. Jones for helping to prepare this *TechCheck* article).

For additional information about this new Standard, contact Mr. Jones by telephone at 812 925 6000 or by email at [ernie@eriinc.com](mailto:ernie@eriinc.com). An audio recording of the BEC presentation, including PowerPoint slides, is available for purchase as part of the *Conference Recordings* package – for more information, visit the NAB Show Online Learning Center at [www.softconference.com/nab](http://www.softconference.com/nab).



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