** TECHNICAL**

 **SESSIONS**

**Lee Kellett, Light Brigade**

Session Title **Avoiding Common Fiber Field Problems**

Short Session Description Those who are involved with field work have seen many examples of improper practices and poor workmanship. You may not be aware of how common this could be with your own staff. Join us to hear about common field issues and learn about the best practices that would solve these problems.

**William Bailey, ETA International**

Session Title **Basic Antenna Theory – Converting Electrical Energy into Electromagnetic Energy**

Short Session Description The efficiency and effectiveness of any wireless communication system will depend greatly upon antenna performance. Simply put, an antenna is a device capable of transitioning electrical energy into electromagnetic energy, but in either direction. The antenna creates a vital link between internal signal processing and free space propagation. This short course, therefore, will provide both technicians and managers working with wireless communication systems the insight needed to understand and evaluate antenna performance. Topics of discussion – basic principle of electromagnetic radiation and induction; antenna characteristics (including resonance, gain, reciprocity, polarization); radiation resistance (ground effect, electric vs. physical length, radiated power); antenna feed-lines (resonant/non-resonant, impedance, and loading effects); and common antenna configuration and applications (half-wave dipole, monopole, arrays, and microwave antenna). Participants will acquire a sound understanding of basic antenna theory.

**Tom Brinkoetter, RadioSiteTest**

Session Title **Measuring Transmission Line Quality Prior to and During Installation on Towers**

Short Session Description The quality of the transmission line cable on a tower or DAS system is critical to the performance of the system. Solid conductor hardline cable is often used as it reduces loss, PIM and leakage. But hard line cable is easily damaged as it is spooled in the factory, cut to custom length and re-spooled by distributors, shipped and installed. The cost of installing hard line cable can approach the cost of the cable itself. If defective cable is installed, the cost of replacement project delay can be significant. It makes good business sense to test the cable as it arrives at the job site and also test the cable as it is installed. This session talks about the tools and methods to easily and accurately test raw spools of cable.

**Luke Ferguson, Valmont Site Pro 1**

Session Title **Evolution of Mount Analysis: Effects of TIA Rev H and TIA-5053**

Short Session Description The first wave of large LTE antennas in 2013 was when the industry first recognized a widespread need for antenna mount analysis. Prior to this time, mount analysis was virtually unheard of. Since 2013, the antenna size has drastically increased, which has led to mount failures.

TIA Rev G did address this issue by stating that mounts need to be analyzed, but it wasn’t until the recent release of TIA Rev H that there has been an entire chapter dedicated to mount analysis. TIA-5053 is making it easier to compare mount capacities by providing a standard method to classify a mount. Both of these codes are working to increase the prevalence and accuracy of mount analysis in our industry.

Now we have a standard method to rate a mount, but analysis methods still vary greatly in the industry. Analysis assumptions can change the rated mount capacity as much as 100%. The upcoming TIA Mount Analysis White Paper will be a way to streamline this process and ensure that everyone is looking at the mounts equally.

For example, we have found that tieback orientation and leg connections have a huge impact on the capacity of a mount. Our research has shown that tieback orientation can affect the strength of a mount as much as 20 percent. The new tieback information we are providing to carriers and engineering firms will make it easier to take tieback orientation into considerations when looking at a mount.

Overall, I will discuss what everyone should know about TIA Rev H and TIA 5053 and give a sneak peek at what is happening with the TIA Mount Analysis White Paper team. Ultimately, all of this new information will help set a standard to ensure that new mounts being installed today will be able to handle whatever is thrown at them over the next 15 years or more.

**J.B. Groves III, FOI, ITS and Les Campbell, Owner Pro Lighting and Electrical**

Session Title **Optical Wireless Communication Demonstrations**

Short Session Description This session is a demonstration session that introduces the participants to optical wireless communications from its conception to some of the technology available today. The demonstrations will cover the following concepts and technologies: VLC; LED binary concept of 1s and 0s; Audio OWC Link; OWC Spot and their use; OWC Downlights and computer, tablet, and smartphone interfacing.

**Douglas Spotted Eagle, Sundance Media Group, LLC**

Session Title **Advanced Applied UAV/Drone Use: sUAS for Public Safety**

Short Session Description An in-depth look at how LEO & Public Safety Personnel can incorporate UAV into their workflow:

- Introduction to UAV for Government Infrastructure (Successful implementations)

- UAV and its uses for LEO & Security Infrastructure

- Overview of cost and time savings:

 · An introduction to using thermal imaging for S&R

 · Find lost hikers; locate a lost senior citizen; track a fugitive.

- Monitor hostile situations from secured/safe vantage points

 · Precision tactical planning with more information available to make decisions

- UAV Policy considerations

**Vincent Scirocco, CETma, Northeastern University (alumni)**

Session Title **DWING, Drone Wars, Interactive Next-Gen Gaming**

Short Session Description I am a recent graduate of Veterans Assembled electronics in Providence, RI, where I obtained Master level tech in five months. My teammate and I designed a game in physical spaces that won one of three top designs chosen among hundreds submitted through Northeastern University's Next-Gen Innovation Competition. The team would go over the dynamics of the system; including the electrode-magnetic devices required, the importance of accuracy and timing of wireless communications throughout the systems and possibly the integration of software required totake a real-time drone game to enhance the user's perspective with special effects using and augmented reality feedback loop derived from the input.

**Frank Perrino**

Session Title **Toxic Air We Breathe**

Short Session Description Discuss Air Quality, Develop HAHAMICE, Demo air quality situation, Establish a Confined Space Safety Culture, Build a cooperative Confined Space team effort, Build on what you think you know Based on Confined Space 1926 (Construction), Discover what is in the air you breathe, Enjoy and develop HAHAMICE (gases that are lighter ta air), and Demo a confined space.

**Greyson Knapp, FOT-OSP, Apex Optics**

Session Title **Wireless Pipeline Monitoring: IoT is the Final Solution**

Short Session Description

* Brief History of Pipeline Leak Detection: Deteriorating infrastructure · Urban development around pipelines carrying hazardous materials
* Legacy Leak detection: “Goes inta – Goes outta “ · Wired systems · Ariel / Drive out pipeline surveys
* Preventative Measures: Cathodic surveys · Sacrificial anodes · Protective coatings
* Drones: Cameras · Gas sniffers /spectrometers
* Fiber Optic Leak Detection: How they work · Power requirements · Limitations (Legacy pipes, Branching)
* IoT solutions: Point sensors +/- · Distribution (Branching, Changing sectional characteristics, Power requirements, Networking)