

10:00 AM - 11:00 AM

IEEE 802.16s - A Narrow Channel WiMAX Standard and Case Study

Kathy Nelson, *Ondas Networks*

Rick Smith, *Chevron*

Room: 350 D

This presentation will provide an introduction and technical presentation of the newly released IEEE 802.16s standard. IEEE 802.16s is a narrow channel WiMAX standard which was a collaboration of utilities, manufacturers, Utilities Technology Council (UTC), EPRI, and the WiMAX Forum. The idea for the standard was first introduced at the UTC annual meeting in Atlanta in 2015 and after over two years of joint work and collaboration on the standard, it was ratified and published by IEEE in October 2017. It is a technology which provides a standard wireless technology solution for mission critical industries in any frequency band in channel sizes between 100 kHz up to 1.25 MHz.

Objectives of this session:

- Education and Introduction of IEEE 802.16s Standard
- Provide information on Chevron's pilot
- Present spectrum options for SCADA telecommunications

Industry Sector: Oil & Gas, Pipeline, Electric Utility, Waste Water, Railroad

Category: SCADA and Data Analytics

Intended Audience: Manager, Field Tech, Engineering

RF Validation and Testing via UAV / Drone

Cody Racette, *End 2 End Technologies*

Room: 350 E

In striving to help customers realize the value of advanced technologies for their business, E2E will take drones to another level by demonstrating their use in outdoor RF Validation. RF Validation is an important step in Wireless Systems Design. Typical RF Validation tools are either hand-held or vehicle-mounted. This means that most tests are performed on ground level or performed using special vehicles to accurately assess the candidate site. This involves extra personnel, safety risks, and most importantly cost. We will demonstrate how UAVs can help reduce vehicle costs and the time required for RF testing.

Objectives of this session:

- RF Surveys using UAV mounted spectrum analyzer
- Direction finding - determine potential interference source and direction using UAV
- Troubleshooting - aid in fault location of an existing radio installation using UAV

Industry Sector: Oil & Gas

Category: Networks/Communications Infrastructures, Emerging Technologies

Intended Audience: Executive/Director, Manager, Field Tech, Entry Level

10:00 AM – 12:00 PM

Effective Private Radio Field Automation Network Architecture - Training by 4RF

(Training requires attendees to bring laptop computers)

Steve Moffat, *4RF USA, Inc*

Technical Sessions Sponsored by:



Room: 352 E

Modern private radio system families deliver advanced IP capability at near broadband speeds in licensed and unlicensed bands with the coverage advantages of near-non-line-of-sight from sub-1 GHz frequencies. Just a decade ago SCADA devices were slow, serial based, without remote management, and there was little interest in IP or SCADA security. In the 21st century the world has changed as IP displaces serial, the need for speed grows and effective security measures becomes urgent. Understanding the 4RF Aprisa family to ensure correct product selection, optimized configuration and to ensure maximum use of the latest management, security and traffic features is key for FAN deployments.

Objectives for this session:

- Learn the key aspects of field area network design and implementation considerations, with a focus on combining the various Aprisa family platforms for maximum effectiveness.
- Hear about techniques that minimize overheads and experience radio feature set tools that enable large scale deployments. Experience hands-on configuration of advanced systems that take capacity constrained radio systems into a fully practical FAN, including newly released enhanced management capabilities.
- Gain an overview of commissioning, system performance and monitoring, migration, and security issues. As the influence of the IT domain expands to control systems, management and security have also become important; these issues will be touched on in the context of the FAN. With the changes in world perspectives security can no longer take second place to connectivity.

Industry Sector: Oil & Gas, Pipeline

Category: Oil & Gas, collection and pipeline distribution, Utility - DA networks

Intended Audience: Users of 4RF products, companies considering new deployments or upgrades to the field area network / SCADA radio systems

10:00 AM - 3:30 PM

Private Industrial LTE: Fundamentals Training by Redline Communications

(4 hour training, lunch break from 12:00 pm – 1:30 pm)

Brad Stipmson, *Redline Communications*

Room: 352 D

This training session will cover the fundamentals of private LTE networks. It is informative for anyone that has not yet been involved with private LTE Networks. In this 4-hour session we will cover, at a high level: the main 3GPP architecture choices, systems building blocks, design types, CBRS opportunity, voice/video/data, security, QoS, P-25 integration, 3GPP mobility and hands-on training with LTE wearables. The session will provide key differences between LTE and Wi-Fi, Mesh, PMP, and Narrowband. By the end of this session, participants will gain valuable knowledge and understanding to enable them to begin engaging in private industrial LTE discussions, more advanced training, as well as planning and deployment activities.

Objectives of this training:

- Educate the participants on fundamentals of LTE
- Learn the difference between private industrial mobile LTE vs. consumer LTE
- Hands-on demo with user equipment

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10:00 AM - 3:30 PM

Drone Basics: Flight Training and FAA Part 107 Exam Preparation - Training by Cape (4 hour training lunch break from 12:00 pm - 1:30 pm)

Kabe Termes, *Cape*

Cape's expert staff of drone pilots have trained individuals and large groups all over the world on safe practices and procedures for drone flight. Whether you're already proficient with drones and simply want to brush up for the Part 107 exam, or you're just getting started flying over your assets, this class will cover aviation basics, current regulations, drone software and all the benefits of aerial intelligence for the energy industry today.

Objectives of this training:

- Goals of Drone Basics: Flight training and FAA Part 107 Exam Preparation Learn the difference between private industrial mobile LTE vs. consumer LTE
- Help students prepare to take the FAA Part 107 Knowledge Exam Category: Inspections, Emergency Response
- Provide a set of best practices for UAS operation based on lessons learned in the field

Category: Inspections, Emergency Response

Intended Audience: IT, Telecoms Managers, Operations Managers, UAV/UAS Program Managers, Health Safety Environmental Managers, Crisis Managers, Drilling Operations

11:00 AM - 12:00 PM

Exploring Digital Transformation in the Energy Industries

Ty Garner, *Speedcast*

Room: 350 D

According to the IDC FutureScape WorldWide Oil and Gas 2018 Predictions, published in December 2017: "By 2018, 75% of all oil and gas companies will have at least one digital transformation initiative in full operation deploying cloud, big data and analytics, process automation, or IoT (Internet of Things) for the organization to advance their IT environment." This session will review how companies have applied robust design of IoT connectivity solutions to provide big data which enhanced their businesses.

Objectives of this session:

- Designing robust solutions in digital transformation efforts
- Various technologies to achieve continuous connectivity
- Applying the big data to improve corporate safety and profitability

Industry Sector: Oil & Gas, Pipeline

Category: SCADA and Data Analytics, Networks/Communications Infrastructures, IoT

Intended Audience: Executive/Director, Manager

FANning the Flame of Oil and Gas Transformation with a Converged FAN

Hansen Chan, *Nokia* & Hermes Figueroa, *Nokia*

Room: 350 E

Field Automation Network (FAN) is becoming a foundation for oil and gas transformation as the industry goes farther and deeper to drill and produce. This session will explore a converged FAN architecture which, by innovatively merging

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private LTE and IP/MPLS, brings broadband services everywhere in the field including onshore and offshore facilities. Its multiservice and convergence capabilities reliably and securely deliver data traffic to ensure safety-critical industrial applications such as automation and location tracking are constantly up and running with high performance. This architecture can further evolve to support IoT as oil and gas companies continue their industry transformation journey.

Objectives of this session:

- How can LTE provide robust and QoS-enabled radio coverage everywhere to support PTT, critical voice/video, data?
- How can IP/MPLS in FAN provide custom service capability for OT and IT applications, as well as seamless interconnection with IP/MPLS WAN?
- How can the converged FAN continue to support future innovations including IoT, virtual/augmented reality?

Industry Sector: Oil & Gas

Category: Networks/Communications Infrastructures

Intended Audience: Manager, Field Tech, Entry Level

Advanced Network Monitoring Techniques to Improve the Reliability of Oil and Gas Communications Networks

Jeff Blank, *Conxx*

Room: 350 F

Leading edge monitoring techniques including machine learning, constant network relationship modeling, and automatic predictive analysis add reliability to communications infrastructure. Vendor issues and incompatibilities are exposed so that they can be rapidly corrected. Millions of messages and tens of thousands of measurements are constantly analyzed to put network operators in control, and management at ease.

Industrial networks have implemented these systems to continuously evaluate network device interactions across the OSI stack. These systems find and correlate anomalies across dissimilar vendors and dissimilar technologies to make on point network remediation recommendations before the anomalies impact the availability of the network, adding increased uptime and speeding time to restoration.

Objectives of this session:

- Why Modern networks require advanced network management systems.
- Demonstrate how actionable intelligence is possible on low bandwidth field area networks.
- Demonstrate why advanced management systems increase network availability and performance.

Industry Sector: Oil & Gas, Pipeline, Electric Utility, Waste Water, Railroad, Mining

Category: Networks/Communications Infrastructures

Intended Audience: Manager, Field Tech, Entry Level

12:00 PM - 1:30 PM

ENTELEC Regulatory & Technology Luncheon

(ENTELEC Members Only)

ENTELEC RT Leadership

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Room: 351 E

The ENTELEC Regulatory and Technology Luncheon is an opportunity to come learn about one of the most important ENTELEC membership benefits, the RT Committee. The ENTELEC Regulatory and Technology Committee was formed to address pressing regulatory developments of interest to ENTELEC's membership. All Members of ENTELEC are eligible to join the Regulatory & Technology Committee. This is your opportunity to come learn how this committee can benefit you and your organization.

1:30 PM - 2:30 PM

Automating Upstream O&G and Connecting that to Industrial Internet of Things (IIoT)

Brent McAdams, *OleumTech Corporation*

Room: 350 D

The Industrial Internet of Things (IIoT) has been growing in conversation, visibility and importance over the last couple of years. This is especially true when considering the impacts on technology in the upstream Oil & Gas environments. This presentation is intended to provide the attendee thought provoking, actionable ideas with technologies and concepts available now, and a glance at some ideas for what might exist over the horizon in connection between Upstream O&G and IIoT.

Objectives of this session:

- A look at the many options for automating the upstream locations
- Connecting that data to the enterprise in IIoT
- Clearing up some of the confusion around IIoT

Industry Sector: Oil & Gas

Category: SCADA and Data Analytics, Emerging Technologies, IoT

Intended Audience: Executive/Director, Manager, Field Tech

Evolving Field Communications: Partnerships at the Edge

Stan Hughey, *Infrastructure Networks*

Room: 350 F

Infrastructure Networks' Chief Strategy Officer and Founder Stanley Hughey will discuss the emergence of communications solutions that can be deployed with little or no capital investment on the part of the operator. These solutions provide long term fixed cost connectivity in support of legacy field automation infrastructure while enabling the implementation of bandwidth intensive edge technologies. Field wide connectivity is achieved in partnership with the operator by leveraging the solution provider's "boots-on-the-ground" field support, engineering and project management capabilities to combine private LTE, fiber access, licensed point-to-point and integration of legacy communications technology. Hughey will present INET customer case studies that show how its customers used this approach to solve industry-wide remote communication problems and create standardized, scalable communications across areas of operation. INET will share the economic benefits of this innovative "Solution-as-a-Service" approach and the hidden cost associated with traditional field communications deployments and ownership. Objectives of this session:

- Identify industry-wide challenges field and corporate leaders face in creating real-time remote communications on the edge.

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- Review case studies to identify where new service and communication solutions have worked for top O&G companies.
- Learn how to leverage partnerships with service providers to create standardized, scalable communications and automation.

Industry Sector: Oil & Gas, Pipeline Production

Category: Networks/Communications Infrastructures

Intended Audience: Executive/Director, Manager, Field Communications

Washington Roundtable - Pardon the Interruption Style; Presented by Keller & Heckman

Wes Wright, *Keller and Heckman*

Room: 351 E

Join Wes Wright and colleagues as he leads an interactive roundtable discussion of the latest news and developments from the Federal Communications Commission (FCC). Keller and Heckman will discuss regulatory and political activities coming out of Washington DC.

1:30 PM – 3:30 PM

Identifying and Locating Interference - Training by Keysight Technologies

Raymond Shen, *Keysight Technologies*

Room: 352 E

With the ever increasing density of wireless signals, and skyrocketing bandwidth of signals, collisions in the spectrum are bound to happen. Such collisions, called interference, may be intentional or unintentional. In either case, communications may be disrupted, and power and therefore money may be wasted. We will summarize various tools to help detect interference, and then locate the interference so as to be able to resolve it.

Category: Spectrum Management, Telecommunications

Intended Audience: Technicians, Installers, Engineers

2:30 PM - 3:30 PM

Radio Based Field Area Networking Technology Evaluation – A Practical Approach

John Yaldwyn, *4RF USA, Inc*

Room: 350 D

Radio based field area networking technology has come of age with good vendor support and wide adoption by energy companies. Determining the right technology for a FAN project involves many variables, in addition to balancing capacity and coverage. How then to choose the most appropriate solution? Vendor neutral evaluation is an important engineering responsibility. This session will offer some benchmark templates and advice on practical open source tools necessary for testing and independent verification.

Objectives of this session:

- Why bother with evaluation, isn't it always down to price? Learn why price isn't everything.
- Develop a test plan to assist with evaluation using past case studies.

Technical Sessions Sponsored by:

- Learn about some practical tools to help with evaluation.

Industry Sector: Oil & Gas, Pipeline, Electric Utility, Waste Water

Category: Cyber Security/Physical Security, Networks/Communications Infrastructures, Professional Development

Intended Audience: Manager, Field Tech

Long-Range LPWAN on the Energy Infrastructure – A Key Enabler for the Connected Future

Daniel Quant, *MultiTech* & Murat Ocalan, *Rheidiant*

Room: 350 E

We describe recent developments in long-range LPWAN with end applications in various energy verticals. For pipeline monitoring, a new system was developed using acoustic leak detection technology. Because of the large distances covered by the pipeline assets, a reliable long-range communication is a key requirement for these deployments. The wireless network implemented on the LoRaWAN standard provided sufficient bandwidth for the deployment of a centralized analytics algorithms – reducing the power needs of the edge devices. Drawing from this experience, we discuss the range, bandwidth, and the reliability of LoRaWAN with respect to the requirements of power and energy applications.

Objectives of this session:

- Open discussion on the state of the industry and effects on pipeline health - Highlighting the risks of current key infrastructures on pipelines and alternatives available today.
- Describe recent developments in long-range LPWAN with end applications in various energy verticals.
- Look specifically at a pipeline use case utilizing the LoRaWAN standard discussing the range, bandwidth, and the reliability of LoRaWAN with respect to the requirements of power and energy applications.

Industry Sector: Pipeline

Category: Networks/Communications Infrastructures, Emerging Technologies, IoT

Intended Audience: Executive/Director, Manager, Field Tech

3:30 PM - 4:30 PM

Legal Liabilities of Industrial CyberSecurity

David Blanco, *AUTOSOL*

Room: 350 D

This presentation presents the context of cyber-threats companies face, breaks the topic down into cases studies, and explains relevant tort liability. The second case examines the compromise of field equipment as a result of a third-party contractor in the context of tort liability and insurance issues.

Objectives of this session:

- Understand the relationship between safety and cybersecurity
- Understand the threats by examining specific cases
- Understand the legal liabilities of cybersecurity incidents

Industry Sector: Oil & Gas, Pipeline

Category: Cyber Security/Physical Security, Networks/Communications Infrastructures, IoT

Intended Audience: Executive/Director, Manager

Technical Sessions Sponsored by:

Maximize Narrowband Network Capacity and Spectral Efficiency with Synchronization

Yonghao Lin, *Cambium Networks*

Room: 350 E

Noise floors in field area networks (e.g., oil well fields and electrical substations) are notoriously high. The rising noise floors can limit capacity by lowering radio modulations, increasing packet re-tries, and preventing connections altogether. A significant contributor to poor network performance by noise is self-interference – the unintended spectral interaction between the radios comprising the network itself. Because RF availability is finite, network operators are constantly challenged to maximize spectral efficiency (bits/s/Hz) to support the increasing network capacity demand. To optimize spectral efficiency, network operators work to open up additional capacity where it does not presently exist by addressing self-interference and channel reuse. This whitepaper outlines the theory behind self interference in narrowband systems and presents a number of techniques available to users of cnReach narrowband radios to maximize spectral efficiency including TDD synchronization, alternating antenna polarizations, and strategic channel planning.

This session outlines the theory behind self interference in narrowband systems and presents a number of techniques available to users of narrowband radios to maximize spectral efficiency including TDD synchronization, alternating antenna polarizations, and strategic channel planning.

Industry Sector Oil & Gas, Pipeline, Electric Utility, Waste Water, Railroad, Mining

Category: SCADA and Data Analytics, Networks/Communications Infrastructures

Intended Audience: Manager, Field Tech

Vendor Shoot Out - Narrowband vs. Broadband; Licensed vs. Unlicensed - The debate continues...

Moderator: Doug Miller, *Conoco Phillips*

Room: 360 C

Come join us as vendors explore current topics relevant to the industry. This will be a lively discussion and audience questions and participation are welcome.