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Utilities Technology Council™ Region 10 Southwest

REGION 10 2018 TECHNICAL CONFERENCE
October 11 & 12, 2018
Courtyard Sacramento Cal Expo
Sacramento, CA

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Thursday, October 11, 2018

7:00AM – 5:00PM **Registration**

7:00 – 8:00AM **Attendee Breakfast**

8:00 – 8:15AM **Welcome Remarks**

8:15 – 9:15 am **Wireless Communications Installation Practices, building for the long term**

With a great many wireless communications deployments there are a certain number of sites that will cause continuing maintenance issues and decreased reliability of the SCADA/DA network. This often results in premature equipment failures, excessive service calls to remote sites, out-of-warranty repairs and a decreased level of confidence in the entire system. Frequently when our field service engineers travel to a customer site to assist in troubleshooting these types of issues we find that there were oversights made during the installation.

Presenter: Mark Wallace, Director of Utility Sales = Western USA - 4RF USA

9:15 – 10:15AM **Microwave Radio Path Design Fundamentals**

It is easy to plug numbers into a computer program, but what is actually going on in the program? This session dives into the following:

- Site & Route Selection
- Path & Site Data
- Path Profiles
- Earth Curvature & Propagation

- System Design
- Noise & Fade Margin
- Interference
- Antennas, Feedline & Connectors
- Passive Reflectors
- Diversity
- Equipment
- Frequency Coordination and Licensing

Presenter: Joveth Manese: Sr. Transmission Engineer – Aviat Networks

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10:15 – 10:30AM **Networking Break**

10:30 – 11:30AM **Two-way Radio Link Design Fundamentals**

Do you know how to properly design an effective two-way radio system? This session covers the following:

- Base Station Site Selection
- Link Budget/Signal Margin/Noise
- Noise Floor
- Coverage
  - Frequencies/Availability
  - Analog vs Digital
- Voice Quality
  - FDMA
  - TDMA
- Antenna Types and Patterns
- P25 Advantages
- Costs
- Frequency Coordination and Licensing

Presenter: Scott Quintavalle, Presales Engineer Consultant – Motorola Solutions

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11:30AM – 12:30PM **Fiber Optic System Design**

Once thought to be the ultimate in reliable high-speed communications technology, utilities are finding that this reliability is diminished by many factors. This session reviews fiber fundamentals and covers things that can go wrong and how to mitigate them. It covers:

- Fiber Types
  - Advantages

  - Disadvantages
  - Capacity
- Connectors & Splicing
- Loss Budget/Signal Margin/Noise
- Methods of Lighting Fiber Conductors
- WDM and DWDM
- Cable Types – Advantages/Disadvantages
  - OPGW
  - ADSS
  - Underground
  - Installation
  - Sag
  - Tension
  - Height
  - Lifecycle
  - Gunshots – Lightning – Backhoe Fades – Vehicle Takedowns
- E-stress
  - Definition
  - Mitigation
- Hardware
- Repair

Presenter: Adam Harrison, Applications Engineer - AFL

12:30 – 1:45PM **Networking Lunch**

1:45 – 2:45PM **PG&E FAN Network**

Historically, PG&E has relied on a variety of networking technologies to communicate with remote devices as well as substations, hydro facilities, and natural gas pipelines. These technologies include microwave radios, fiber optic cables, licensed and unlicensed MAS based systems, VSAT and BGAN satellite radios, leased lines, and cellular modems. Many of these technologies are costly to maintain, outdated and are no longer able to meet PG&E's field communication needs.

In 2014, PG&E kicked off a process to upgrade its field communications infrastructure to a broadband, IP-based, RF Field Area Network (FAN) to enable enhanced two-way communications with field devices spread out across the utility's diverse service territory. The broadband FAN's goal is to enable improved

communications – more bandwidth and extended coverage compared to what exists today – from existing backhaul nodes to a variety of field devices. The FAN will support the communication needs of legacy equipment as well as modern equipment and will connect to PG&E's existing MPLS-based core network.

This presentation will describe the process PG&E used to establish the requirements for their modern RF FAN, evaluate various technologies and vendors with respect to their ability to meet the requirements, and to select the technologies and vendors that will be used in the RF FAN roll out. It will also detail how a variety of RF technologies can be integrated into a single, holistic RF FAN in an optimized fashion to meet the needs of PG&E's diverse service territory, variety of supported applications and wide range of connected equipment.

Presenter: Dewey Day, Principal OT Architect Enterprise Architecture & Strategy – Pacific Gas & Electric

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2:45 – 3:00PM **Networking Break**

3:00 – 4:00PM **SCE – RADWIN Case Study**

With SCE's vast territory, extending the administrative network has become much more challenging and expensive. Introducing RADWIN's wireless technology into the SCE network has mitigated costs considerably and created less extensive timelines to support our internal clients. Our pilot trial has proven promising results, being able to provide fiber-like speeds while maintaining a stable network for our client. This presentation will describe the process used to integrate the RADWIN technology into the network and analyze its performance thus far.

Presenter: Samir Wadhwani, Telecommunications Engineer - Southern California Edison

4:00 – 5:00PM **MPLS vs Carrier Ethernet**

Reports are that some Carriers are reducing expenditures on MPLS and increasing expenditures on Carrier Ethernet. This session discusses trends in IP and digital multiplex. What will be here in five years? What is on the horizon?

Presenters: Mike Robinson, Cisco Systems

5:30 – 7:00PM **Networking Reception**

Friday, October 12, 2018

7:30 – 10:30AM **Registration**

8:00 – 9:00AM **Attendee Breakfast**

9:00 – 10:00AM **Training Session: Designing Secure Power Utilities Networks – Part I**

With today's P&C requirements, having a properly architected and secure OT networks becomes vital to safety and operations. During the session we will have a walk through the development of OT networks from legacy, current to what the future holds. The session will cover the fundamental differences between IT and OT networks, discuss core security principles and NEC-CIP requirement. The session will be concluded with network design and security guidelines specific for power utilities networks.

Presenter: Tamer Soliman, Network Architect – Critical Infrastructure Applications - iS5 Communications Inc.

10:00 -10:15AM **Networking Break**

10:15 – 11:15AM **Training Session: Designing Secure Power Utilities Networks – Part II**

11:15AM – 12:15PM **Wrap-Up**