BULLETIN

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TO: All Personnel

FROM: Roger M. Fisher, Deputy Fire Chief, Emergency Command & Data Center
Ted Moran, Deputy Fire Chief, Logistics

SUBJECT: Introduction of New Communications-On-The-Move (COTM) System in Command Vehicles

SDFD has integrated new communications equipment into our command vehicles as part of our ongoing efforts to enhance field operations. This system, known as Communications-On-The-Move (COTM), is designed to ensure reliable and high-speed connectivity, even in denied or degraded areas where traditional cell coverage may be compromised.

Key Features of the COTM System:

1. Multi-SIM Card Modems (Dejero Blended Technology)

   - The COTM system leverages Dejero's blended connectivity technology, which simultaneously uses multiple SIM cards from FirstNet, Verizon, and T-Mobile networks. This blended network technology intelligently combines available cellular signals from multiple carriers into a single, reliable connection.
   - How it works: Dejero's technology monitors the strength and performance of each available cellular network and dynamically blends the connections to ensure maximum bandwidth and reliability. This approach allows the system to switch seamlessly between cellular providers, ensuring robust connectivity even in areas where only one or two networks are available.
   - This redundancy means you will have continuous internet access for data sharing, situational awareness, and operational coordination, even in areas where cellular service is typically spotty or overloaded due to high demand.

2. OneWeb Satellite Connectivity

   - In situations with no cellular service, the OneWeb low-Earth orbit (LEO) satellite antenna will automatically engage, provided it has a clear view of the sky.
   - The satellite connection delivers high-speed, low-latency internet, enabling continued access to critical communications and data in areas where terrestrial networks are compromised or unavailable.
   - The Intellian OneWeb OW11FV Enterprise Flat Panel Antenna is built for harsh mobile environments and is certified to IP66 standards for protection from water. No special protection is required when washing the vehicles.

3. Operational Benefits

- Blended Connectivity for Reliability: By blending the bandwidth from multiple cellular networks, Dejero technology ensures a reliable and resilient connection in almost all operational environments. Whether one or more networks degrade, the system adapts and keeps you connected.
- Seamless Transitions: The COTM system automatically transitions between cellular and satellite networks as needed, allowing you to focus on your mission without worrying about connectivity interruptions.
- Improved Command & Control: This enhanced communication capability allows for real-time decision-making, improved coordination with ECDC, and the ability to maintain situational awareness during incidents.

4. Connection Instructions

    a. SSID (Wi-Fi Network Name): The unit's SSID will follow the format SDFD [Unit/Vehicle ID] COTM. For example, Battalion 1's network will appear as SDFD B1 COTM.
    b. Password: The password for each vehicle will be the vehicle ID repeated twice. For instance, if your vehicle ID is 1234, the password will be 12341234.
    c. Connection Steps:
        i. On your device, locate and select the SSID (Wi-Fi network) for your command vehicle.
        ii. When prompted, enter the corresponding password as described above.
    d. Important Considerations:
        i. For the OneWeb satellite connection to function, the antenna must have an unobstructed view of the sky. Ensure that command vehicles are positioned accordingly when relying on satellite coverage.
        ii. As we roll out this technology, please report any connectivity issues or performance concerns to the ECDC so they can be addressed promptly.

5. For Assistance: If you have any questions or encounter any issues with the COTM system, please contact Battalion Chief Chuck Macfarland at 619-602-6372. This new system is a critical enhancement to our field operations, ensuring that SDFD personnel can remain connected in even the most challenging environments. Your cooperation and feedback will help us optimize its performance. A technical reference sheet with more detail on the program is published with this bulletin.

Informational Sheet

Enhancing Connectivity for San Diego Fire Department Command Vehicles

Introduction

The San Diego Fire-Rescue Department (SDFD) is committed to leveraging the latest technology to improve operational efficiency and effectiveness. A crucial component of this strategy involves upgrading the communication systems in command vehicles. Transitioning from single SIM Cradle Point mobile modems to Dejero 211 multi-SIM card (FirstNet, Verizon, and T-Mobile) modems integrated with OneWeb satellite technology promises to provide SDFD with resilient and redundant broadband connectivity, ensuring continuous communication capabilities in all scenarios. This advanced equipment was obtained through the Urban Areas Security Initiative (UASI) grant funding, which supports acquiring technologies that enhance regional preparedness and response capabilities.

Current Challenges with Single SIM Cradle Point Mobile Modems

Limited Connectivity and Reliability

- **Single Network Dependence:** The existing Cradle Point modems rely on a single SIM card, tethering the command vehicle's connectivity to one carrier's network. This dependence can result in significant connectivity issues in areas with weak or no coverage from that specific carrier.
- **Network Congestion:** During large-scale emergencies, network congestion can severely impact data transmission speeds, potentially delaying critical communications and operational coordination.
- **Signal Interference:** Geographical challenges and infrastructure interference can further degrade the signal quality, impacting the overall reliability of the connection.

Advantages of Dejero 211 Multi-SIM Card Modems and OneWeb Satellite Technology

1. Enhanced Connectivity through Multi-SIM Technology

- **Carrier Aggregation:** The Dejero 211 modems utilize three SIM cards from different carriers, aggregating their networks to ensure robust and high-speed internet connectivity. This carrier diversity mitigates the risk of total connectivity loss due to a single carrier's network failure or congestion.
- **Optimized Bandwidth Usage:** Seamlessly switching between multiple carriers allows for optimized bandwidth usage, ensuring consistent data speeds and reducing latency, which is crucial for real-time communication and data transfer.

2. Redundancy and Resilience with OneWeb Satellite Integration

- **Always-On Connectivity:** Integrating OneWeb's low Earth orbit (LEO) satellite technology provides a backup communication channel unaffected by terrestrial network disruptions. This satellite connection ensures that command vehicles

maintain an internet connection even in remote areas or during catastrophic events that may damage terrestrial infrastructure.
- **Reduced Latency:** OneWeb's LEO satellites orbit closer to Earth than traditional geostationary satellites, significantly reducing latency. This improvement is vital for real-time applications such as video conferencing, live-streaming incident footage, and instantaneous data sharing with command centers.

3. Seamless Blending Technology with Dejero

Dejero's blending technology offers a revolutionary approach to maintaining reliable and high-quality connectivity by intelligently combining multiple network connections. This ensures uninterrupted and optimal performance even in challenging environments.

Key Features and Benefits of Dejero Blending Technology:

- **Intelligent Routing:** Dejero's technology continuously analyzes the performance of each available network connection (cellular and satellite) and intelligently routes data through the best-performing paths. This dynamic routing maximizes bandwidth efficiency and minimizes latency.
- **Adaptive Bitrate Streaming:** By blending multiple network connections, Dejero can adapt the bitrate of video and data streams in real time based on network conditions. This ensures smooth and high-quality video transmission without interruptions, even when individual network connections fluctuate in quality.
- **Load Balancing:** The technology distributes the data load across multiple connections, preventing any network from overloading. This balanced approach enhances overall connection stability and reliability.
- **Error Correction and Recovery**: Dejero employs advanced error correction and packet recovery mechanisms to ensure data integrity. This is crucial for maintaining the quality of critical communications, especially in environments with high interference or packet loss.
- **Seamless Network Transition**: In the event of a network failure or significant degradation, Dejero's system seamlessly transitions data traffic to the remaining active connections without any noticeable disruption. This automatic failover capability is essential for maintaining continuous connectivity in unpredictable scenarios.

Connectivity in Denied Environments-Example

Ensuring Communication for Battalion Chiefs as Strike Team Leaders (STEN) in Remote Areas

One of the most critical applications of the Dejero 211 multi-SIM card modems and OneWeb satellite technology is providing reliable connectivity in denied environments, such as remote areas where traditional networks may fail. This is particularly vital when our Battalion Chiefs serve as Strike Team Leaders (STEN) during wildfires or other emergencies in isolated regions.

Benefits for Remote and Denied Environments:

- **Remote Area Coverage:** The combination of multi-SIM technology and satellite integration ensures that a reliable communication channel is available even in the most remote locations, where cellular coverage is sparse or nonexistent. The OneWeb satellites provide global coverage, ensuring connectivity anywhere.
- **Resilience in Adverse Conditions:** The robust design of the Dejero system, with its ability to switch seamlessly between multiple carriers and satellite links, ensures that communication remains uninterrupted despite environmental challenges such as terrain obstructions or weather conditions.
- **Critical Data Access:** Maintaining access to real-time data and communication channels allows Chiefs to coordinate their crews effectively, manage resources, and make informed decisions quickly. This capability is crucial for ensuring the safety and effectiveness of the response efforts in remote and challenging environments.
- **Operational Continuity:** The system's redundancy and resilience features guarantee that communication lines remain open, allowing continuous updates and coordination. This uninterrupted flow of information is essential for operational continuity and effectiveness during prolonged operations in denied environments.

Operational Benefits

1. Improved Situational Awareness

- **Real-Time Data Transmission:** Reliable and high-speed connectivity allows for real-time transmission of video, images, and data from the field to command centers. This capability enhances situational awareness and enables faster, more informed decision-making during emergencies.
- **Enhanced Coordination:** Continuous communication ensures synchronization of all units, improving coordination and response times. This capability is critical in dynamic situations where conditions can change rapidly.

2. Increased Efficiency and Safety

- **Remote Access to Resources:** Personnel can access remote databases, GIS systems, and other critical resources without delay, ensuring that personnel have the information they need at their fingertips.
- **Safety of Personnel:** Reliable communication systems reduce the risk of information delays or loss, which can be life-threatening in emergencies. The ability to maintain contact with all units ensures that personnel safety and well-being are prioritized.

3. Cost-Effectiveness

- **Reduced Downtime:** The redundancy provided by multi-SIM and satellite technologies minimizes downtime, ensuring that resources are utilized efficiently and that connectivity issues do not hinder operations.
- **Future-Proof Infrastructure:** Investing in advanced communication technology like the Dejero 211 modems and OneWeb satellites ensures that SDFD’s communication infrastructure is future-proof, capable of adapting to evolving technological landscapes and increasing demands.

4. Voice over IP (VoIP) Integration

Dejero's and OneWeb advanced connectivity solutions also support Voice over IP (VoIP) services, providing clear and reliable voice communication even in remote or congested areas.

Benefits of VoIP Integration:

- **Enhanced Voice Communication:** With the integration of VoIP, SDFD can ensure high-quality voice communication for command vehicles, allowing for clear and uninterrupted conversations even in areas with poor traditional cell coverage.

Obtaining Advanced Equipment through UASI Grant Funding

Dejero 211 multi-SIM card modems and OneWeb satellite technology were acquired through the Urban Areas Security Initiative (UASI) grant funding. Through this grant, SDFD procured cutting-edge communication equipment that ensures continuous and reliable connectivity, significantly improving our emergency response and operational efficiency.

Impact of UASI Grant Funding

- **Enhanced Capabilities:** The UASI grant has enabled SDFD to incorporate state-of-the-art technology into our command vehicles, providing a robust communication network that is vital during emergencies.
- **Regional Preparedness:** The improved connectivity supported by the grant funding enhances the overall preparedness of the San Diego region, ensuring that our response to emergencies is swift, coordinated, and effective.
- **Sustainable Investment:** The funding has allowed SDFD to make a sustainable investment in future-proof technology, ensuring long-term benefits and improved operational capabilities for years to come.