

Hawai'i Statewide Shared Blended (SSB) Radio System

**State of Hawai'i – Information and
Communication Services Division
and
County of Maui – Police Department**

October 5 – 6, 2010



The PSIC Opportunity

The PSIC Grant Program provides assistance to public safety agencies in the acquisition of, deployment of, or training for the use of interoperable communications systems that utilize – or enable interoperability with communications systems that can utilize – reallocated 700 MHz spectrum for radio communications

The Partners:

State of Hawai‘i

County of Maui



Hawai'i Statewide Shared Blended System (SSB)

- **The Objective:**

Develop and deploy a statewide land mobile radio communications capability using APCO Project 25 standards for first responders in the State of Hawai'i and its Counties

- **The Reality:**

PSIC funds available between the partners would not initially be able to create a true statewide system



The Plan

- **Acquire Project 25 based narrowband digital infrastructure that supports vendor-neutral subscriber equipment**
 - **Prohibit the provisioning and/or installation of vendor unique enhancements or extensions to the P25 feature sets for conventional and trunked operation**
 - **Require the system vendor to deliver working samples of subscriber equipment from as many vendors as possible**
- **Avoid capital construction and limit non-radio expenditures by utilizing existing facilities and transport networks**
- **Use both 700 MHz Public Safety spectrum, NPSPAC 800 MHz spectrum, and other 800 MHz spectrum allocations as appropriate**
- **Require redundant and geo-diverse P25 system controllers**
- **Recommend IP-based interconnection of system components**



The Plan - Hawai'i Specific Items

- **At nine County of Maui sites add a channel to the existing master antenna systems to support a single conventional 800 MHz repeater**
 - Also add a NPSPAC 800 MHz conventional repeater to a State site on O'ahu that provides fill in coverage to the west end of Maui County
- **At five strategic sites that cover areas of expected high traffic install 700 MHz Public Safety band trunked repeaters**
 - Sites range in capacity from 4 to 6 channels (3 to 5 working channels)
 - Two on Maui, one on Lāna'i, and two on O'ahu
- **Install a single conventional repeater in the 700 MHz band to provide P25 coverage in Kailua-Kona on Hawai'i island**
 - Demonstrate P25 digital operation on the Big Island



The Plan - Hawai'i Specific Items

- Install a dispatch console at the State Sheriffs' Dispatch Center on O'ahu
- Connect system Talk Groups into the County of Maui's Orbacom dispatch console system
- To the extent possible operate with P25 capable subscriber equipment in the current inventory
 - State Law Enforcement Coalition (SLEC) 700 MHz P25 digital narrowband conventional system
 - State of Hawaii Department of Transportation 800 MHz (NPSPAC and other) trunked and conventional systems
 - County of Maui Police Department 800 MHz NPSPAC trunked system
 - State Department on Land and Natural Resources staff in Maui that use the County system



The Process

- Develop and release a Request for Proposals to determine eligible systems manufacturers
- Identify manufacturers meeting system requirements
- Conduct site walks and request updated proposals to include estimated costs via separate, sealed submittals
- Evaluate and score proposals, and determine the best technical solution meeting the project needs and site requirements
- Negotiate best and final offer

The Players:

EADS (now Cassidian), EF Johnson, MA/COM (now Harris), Motorola, and RELM Wireless



Project Status

- **Successful Bidder is EF Johnson Technologies**
- **Factory Acceptance Test completed in Irving, TX in June 2010**
- **Expect to complete system installation by month's end**
- **Expect burn in and testing to conclude by the end of November 2010**
- **Status**
 - All sites on the island of Maui are complete
 - All sites on the island of O'ahu are complete
 - Installation of sites on Hawai'i, Lāna'i and Moloka'i islands starts next week



Use of Multiple Talk Groups on a Single Conventional Repeater

- Talk Groups are transmitted over both Trunked and Conventional repeaters
- To ensure system efficiency, the Conventional repeater sites only transmit Talk Groups that have a Subscriber actively registered on the site
 - Subscriber units register into a Conventional site on first key-up
 - EFJ equipment registers automatically when the unit powers up and when changing site (programmed as a zone)
 - Subscriber units are de-registered from Conventional sites by a system timer
 - EFJ equipment de-registers automatically when changing site and when the unit powers down



Vendor Agnostic Subscriber Radios

The contract required delivery of P25 trunking capable portable subscriber radios that were proven to work on the system and two each of the following radios were provided:

- EF Johnson 5100ES
- Harris P7250
- Kenwood TK5410-K2
- Motorola XTS-5000
- Tait TP9155IS
- Thales Liberty



What We Gave Up

- Coverage Performance Guarantee
 - Omitted to control costs (just stay with the sites currently available)
 - Not a great concern in Maui County as the existing 800 MHz coverage is well understood
 - Oahu trunk site coverage is TBD but the O‘ahu trunk sites complement the existing SLEC conventional 700 MHz radio system (Motorola)
- Conventional Site - Automatic Registration and Roaming
 - Unless EF Johnson subscriber equipment is used
 - Not an issue for trunked sites
- Easy Subscriber Unit Management
 - We expect that use of multiple brands of subscriber radios will make management of user radios less easy



Unforeseen Benefits

- Identified and cleared an IP address space for this and other P25 radio systems within the State of Hawai‘i
 - Full Class B address space (65,534 addresses)
 - Infrastructure components such as repeaters, servers, switches, etc.
 - Clears the way for cleaner inter-system routing and interconnect
- Mapped Talk Group and Unique ID numbering scheme
 - Prevents duplication between systems
 - Allows users within the State to be brought into non-native Talk Groups or Systems without the need to re-address units



Next Steps

- **In the Near Future [not so big \$]**
 - Trunk site in Hilo?
 - Support for State Civil Defense logistics arm
- **Eventually [big \$\$\$]**
 - Trunking build out to cover all of O‘ahu
 - Expansion to Kaua‘i
 - Increase coverage in Hawai‘i County
 - Update/replace stand alone campus trunked radio systems
 - Primarily State DOT – Airports, Harbors, Highways



Thank You

- **U.S. Coast Guard District 14 and the Electronics System Support Unit (ESU) Honolulu**
 - **The State of Hawai‘i’s partner in the ANUENUE digital microwave system**
 - **Survivable statewide backbone with OC-3 capacity provides Ethernet and T1 transport to the SSB**
 - **Use of the Sand Island ANUENUE radio facility in Honolulu harbor for an SSB trunked radio site**
 - **Future use of the USCG ANUENUE radio facility in Hilo harbor for an SSB trunked radio site**
- **County of Hawai‘i**
 - **Use of the Kailua Police Station for a conventional radio site**
 - **T1 transport on the County of Hawai‘i loop microwave system**



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