Oregon State Interoperability Executive Council

Guide for Short Term Interoperability

Adopted by the SIEC Technical Committee
November 17, 2004

The Oregon State Interoperability Executive Council (SIEC) and the State of Oregon encourage Oregon's public safety agencies to develop interoperable communications systems that encompass all of the elements of public safety. To most, the issue of "interoperability" is a confusing maze of trade journal articles, technical mumbo jumbo, and vendor hype. The SIEC has assembled this guide to assist non-technical, everyday public safety personnel in achieving simple, short-term interoperability solutions to enhance day-to-day operations that afford preparation for major multi-jurisdictional events. These short-term efforts are leading to longer term and much more comprehensive solutions to wireless interoperability for public safety agencies throughout the entire State of Oregon.

Radio Programming: The simplest means to gaining a measure of interoperability is programming existing, operational channels from agencies that are adjacent to each other geographically and that operate in the same frequency band, into your radio. Each county, state agency, municipal and special district radio manager should agree to allow other responders, on the same frequency band, to use their radio system on designated interoperable channels when necessary. Formal model agreements can be obtained through the SIEC. As an aside, it is highly recommended that adjacent agencies think about radio templates that follow some predictable rationale and that use common nomenclature for channel identification.

The second simplest means to another level of interoperability is found in the FCC's newly established nationwide interoperability channels. Every portable and mobile radio in Oregon should include all of these interoperable channels that are within the same band of operation as the basic radio. Interoperability channels are available in all of the public safety bands and are designed to allow folks to communicate anywhere in the country, within each frequency band.

Make sure new radios you purchase have adequate channel capacity to accommodate all of the additional interoperability channels. It is the SIEC's recommendation for both interoperability and for the receipt of federal funds based upon interoperable communications that these nationwide interoperability channels shall be programmed into every Oregon public safety subscriber radio. In VHF subscriber radios, the other channels that should be in every radio are the State Fire Net (154.280 MHz) and the State Police Net – OPEN (155.475 MHz). VHF interoperability channels can be utilized on a secondary basis to interoperable communications for day-to-day tactical needs as well so that personnel are accustomed to utilizing them.

The following is the SIEC's guide for programming the FCC designated interoperability (I/O) channels into existing radios and all new radios that are added to any system. Due to space limitations in some radios, it may not be possible to program all of the I/O channels into all radios. In that case, at a minimum, the calling channel and the first tactical channel should be programmed. The frequencies listed are in each of the three bands and are listed by order of priority, with highest priority shown at the top of the list. They are to be programmed into the radios with the highest priority first, as space permits.

***Note*: As of January 1, 2005, existing systems on these channels and those existing systems on the adjacent channels become secondary to these interoperability channels. In the event of interference, existing systems must cease use when interference occurs to interoperability channels.**

VHF Radios

Channel (MHz)		Label	Description
155.7525	base/mobile	VCALL	National Calling
151 .1375	base/mobile	VTAC 1	National Tactical
154.4525	base/mobile	VTAC 2	National Tactical
158.7375	base/mobile	VTAC 3	National Tactical
159.4725	base/mobile	VTAC 4	National Tactical

UHF Radios

Channel (MHz)		Label	Description
453.2125	Base/mobile	UCALLa	National Calling
458.2125	mobile	UCALL	National Calling
453.4625	base/mobile	UTAC 1 a	National Tactical
458.4625	mobile	UTAC 1	National Tactical
453.7125	base/mobile	UTAC 2a	National Tactical
458.7125	mobile	UTAC 2	National Tactical
453.8625	base/mobile	UTAC 3a	National Tactical
458.8625	mobile	UTAC 3	National Tactical

800 MHz Radios

Channel (MHz)	Label	Description
821/866.0125	ICALL	National Calling
821/866.5125	ITAC-1	National Tactical
822/867.0125	ITAC-2	National Tactical
822/867.5125	ITAC-3	National Tactical
823/868.0125	ITAC-4	National Tactical
821/866.3250	OROPS1	Oregon Tactical
821/866.3875	OROPS2	Oregon Tactical
821/866.7500	OROPS3	Oregon Tactical
821/866.7750	OROPS4	Oregon Tactical
821/866.8000	OROPS5	Oregon Tactical
867.5375	STATEOPS-1	Washington Tactical
867.5625	STATEOPS-2	Washington Tactical
867.5875	STATEOPS-3	Washington Tactical
867.6125	STATEOPS-4	Washington Tactical
867.6375	STATEOPS-5	Washington Tactical

Use of interoperability channels

Calling channel: The calling channel shall be used to contact other users in the region for the purpose of requesting incident related information and assistance, and for setting up tactical communications for specific events. In most cases, the calling party will be asked to move from the calling channel to one of the TAC channels for continuing incident operations or other interoperability communication needs. This channel can be implemented in full repeat mode in 450 MHz or 800 MHz systems. In the 150 MHz, 450 MHz, and 800 MHz bands, direct or a talk-around/simplex mode can be used.

Tactical channel: By FCC rules, the tactical channels are to be used for coordination activity between different agencies in a mutual aid situation. However, in non-interference instances, they may be used on a case-by-case basis for emergency activities of a single agency. Incidents requiring multi-agency participation will be coordinated over these channels by the agency controlling the incident. These channels can be implemented in full repeat mode in 450 MHz or 800 MHz or they may be used on a direct direct (talk-around/simplex) mode in 150 MHz, 450 MHz, or 800 MHz.

Dispatch Centers and Interoperability: On a short term basis, the 9-1-1 dispatch centers in Oregon should add base stations and/or control stations on the VHF, UHF, and NPSPAC 800 MHz interoperability channels as are appropriate for use in any statewide supporting infrastructure. The SIEC is working on longer term methods of coordination of interoperability channels on a statewide basis. Gateways, interoperability switches, or console patching are strongly encouraged at 9-1-1 dispatch centers in the short term to allow connection of interoperable VHF, UHF, and NPSPAC channels to the operating channels within the center's range.

Purchasing New Radios And Systems: If your agency is in the market to purchase new subscriber radios or a new radio system, you may choose to utilize the SIEC Technical Committee as a sounding board to help clear the confusion and provide guidance and suggestions to assure maximum interoperability in the most effective manner. By FCC rules, all new VHF and/or UHF systems (meaning below 512 MHz) shall be implemented using narrowband (12.5 kHz bandwidth) technology.

Note: As of January 1, 2008, FCC rules will no longer allow manufacture or importation of any radio that has a mode in it that works on existing wide band systems.

If your agency intends to remain on VHF and/or UHF public safety radio frequencies, it is important to start the migration to meet FCC timelines for conversion to narrowband operation. The mandate for a complete conversion to narrowband operation is January 1, 2018.

When purchasing new VHF and/or UHF portable or mobile radios, make sure they are narrowband compatible. This is consistent with FCC requirements. All VHF radios must be capable of programming on 7.5 kHz and 12.5 kHz channel assignments.

The SIEC's recommendation for priority in receipt of federal funding for interoperable communications is to strongly encourage conversion to digital technologies. The primary reason is that digital technologies operate in only 72% of the band occupied by narrowband analog technologies, and they suffer no reduction in voice quality or in system range with this added efficiency.

The SIEC recommends that all radios procured for interoperability shall, at a minimum, be capable of programmable conversion from analog to digital operation. The only acceptable digital operation is in compliance with the Project 25 standards. The applicable standards are within the ANSI/TIA/EIA 102 series. All portions of that standard that define the common air interface and the vocoder are to be complied with. Whenever encryption is also used, the Project 25 encryption documents must be complied with as well.

It suggested that you consider the use of multimode (digital and analog) technologies, and multi-band operation as these features might become available. You may choose to not implement Project 25 technologies while you are continuing to operate or are building an analog system. As of 2004, federal Homeland Security grant funding is being allowed for these analog solutions, but indications for the 2005 grant funding cycle are that all interoperable communications grants will be required to adhere to the Project 25 standards.

Note: If you build a new system or convert an existing one to narrowband, it is likely that some of your older mobile and portable radios will not work on the narrowband frequencies. However, you will need that verification from your vendor. The newer radios will work in both modes.

For more information about the Oregon SIEC, go to http://egov.oregon.gov/SIEC/