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KSICS

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Section 1:

Kansas Statewide Interoperability Communication System (KSICS) is a Motorola P-25 Phase 1 FDMA 700/800MHZ 6 channel wide area trunked public safety trunked radio system.

1. a KSICS is comprised of 120+ towers ranging from 480 Ft guyed to 120 Ft self-supporting. 1.a. i Each of the State-owned towers has generator backup and walk-in enclosure that houses associated equipment.
1.a. ii County towers that are part of the shared system are both owned and leased.

1. b All KSICS tower sites use Motorola GTR 8000 100 watt 700/800 MHZ P-25 radios.
1.b. i The 77 primary sites located across the state have a minimum 6 channel trunk system, repeated conventional 800, UHF, VHF, and VHF LOW that are IP connected for interoperability or stand-alone usage by public safety.
1.b. ii KSICS is currently using software release 2021.1 and is scheduled to be on release 2022.1 by end of CY2022. The system is a Motorola P-25 700/800 trunked system that is operating on both FDMA Phase 1* and TDMA Phase 2** capability.

*Phase I FDMA consists of C4FM modulated signal or a CQPSK modulated signal. Both fit in a 12.5 kHz channel. Subscriber equipment transmit in C4FM. Site equipment may transmit in C4FM or CQPSK. Simulcast uses CQPSK modulation

**The Phase II standard is a 2-slot TDMA signal that fits inside a 12.5 kHz wide channel, providing a two 6.25 kHz-equivalent channels. Fixed site output modulation is H-DQPSK with subscriber units using H-CPM on the input. This allows existing 12.5 kHz wide license holders to double call capacity by upgrading their infrastructure to Phase II. The Phase II standard was Finalized and Approved in November 2010889

1.c All associated infrastructure is connected back to one of the two MSOs or COREs via an IP scheme.

i. Microwave is a licenses RF point to point signal path that can be divided for multipath signaling or information transmission. Equipment used is typically a dish mounted at a specific elevation directly pointed at a corresponding tower with another dish pointed back. These two dishes transmit data between each other via a radio housed either in the shelter at the tower or directly connected to the dish on the tower. Typical transmission rate is limited to 100 MHz per second and limited to under 40 miles due to horizon.

ii. Fiber is a laser injected glass that can transmit over an unlimited distance (amplification required) with multiple information pathways at rates exceeding 100 Gigabit per second. Each end of a connection requires specific switching equipment for transmission of data.

iii. Other forms of connectivity can include control stations that provide a single talk path for talk group transmission. LTE broadband which can also pass a single site via IP Ethernet data transmission.

b. Maintenance of KSICS state owned infrastructure is performed by qualified technical staff of the Kansas Department of Transportation or contracted personnel authorized by KDOT.

i. Scheduled maintenance of the system is performed regularly by field personnel to ensure performance and compliance of the FCC License for radio transmission. Maintenance information is provide via email by KDOT. Request to be added to this list can be made by emailing ksics_encryption@ks.gov

ii. Unplanned maintenance of the system due to equipment failure is done without notice and repairs are made based on severity, travel time, and availability. Notification of infrastructure failure can be made by emailing ksics_encryption@ks.gov

c. Radio status or “State of Operation” a radio is functioning in.

i. Wide area status has no indication on the display and your device full functional usage based on feature set of the radio and tower site you are affiliated with.

ii. Site Trunking is indicated on the display of the radio. This status means that the radio is affiliated to a tower that does not have connectivity to the MSO or CORE and only radios affiliated with that tower can communicate on a talk group.

iii. Fail soft is an operational state that the affiliated tower is in that does not provide radio to radio repeated communication. Effectively the radio is out of range for operational usage.
iv. Out of Range as indicated on the radio means that the radio does not have a tower it can affiliate with.

Section 2: User Device Requirements for KSICS will take effect January 1st 2024. These requirements apply to all new radios purchased for public safety usage of KSICS.

a. P25, or Project 25, is a suite of standards developed to provide digital voice and data communication systems suited to public safety and first responders. Project 25 was initiated by the Association of Public Safety Communications Officials, or APCO.
b. CAP P25 CAP, a voluntary program, allows suppliers to publicly attest to their products' compliance through P25 CAP testing at DHS-recognized laboratories. As proof, suppliers are required to submit Summary Test Report (STR) and Supplier's Declaration of Compliance (SDOC) documents. These documents are available on the Approved (Grant-Eligible) Equipment page. It is this list, and only this list, which is referenced by several federal grant programs, including the Federal Emergency Management Agency, as allowable equipment to be purchased. The varying P25 labels can be confusing, and our guide on P25 terminology explains the program and how the terms apply.
c. 700/800MHz is defined as operational capability for 700 narrowband 768-775/798-805 and both 800 NPSPAC and non-NPSPAC 806-809/851-854 and 809-815/854-860.
d. OTAR is a remote form of programming that requires special remote accessibility to a radio or device. This function allows for remote programming of the radio.
e. AES Encryption is a 256 bit encryption standard required for federal grant fund usage and required for KSICS standardization of template encrypted channels.

Section 3: User Device Maintenance: Mobile radios must be maintained on a regular basis, this maintained includes, but is not limited to firmware upgrades and Tune/Alignment to ensure that radios on the state system work at the optimum level. It is important that mobile radios have firmware updated on a regular basis to ensure that new functionality is added and security issues and glitches are minimized. It is also recommended that radios be tuned/aligned every 24 months to ensure that your radio works at an optimized level. Optimization will ensure that your radio is able to maximize the coverage available on KSICS or any LMR radio system.

a. Firmware: is a software upgrade to the device system itself that allows for optimization, new functionality as well as security and bug fixes to enhance the performance or fix a problem.

b. Tune/Alignment: in radio terms, means to adjust the radio transmit and receive or to optimize its ability to receive a radio signal in a specific frequency that your radio is set to operate on.

f. Mobile Radios:
    1. Tune/Align recommended at least every two years.
    2. Firmware upgrades every year.
    3. Check annually with your radio service provider on system updates and control channel additions.
g. Portable Radios:
    1. Tune/Align recommended at least every two years.
    2. Firmware upgrades every year.

3. Check annually with your radio service provider on system updates and control channel additions.

h. Control Stations:

1. Tune/Align recommended at least every two years.
2. Firmware upgrades every year.
3. Check annually with your radio service provider on system updates and control channel additions.

Section 4: Template Usage

a. State Template: The KSICS State Template (see map in appendix) divides the Homeland Security Regions into the 14 radio zones.

b. Regional Talk Groups: PSAP, MED, TAC1 and TAC2 are talkgroups that have been created for regional use within the template. The intent is for the talkgroups to be used for interoperability or where local legacy communications systems do not provide sufficient capabilities. The talkgroups are available state-wide.

c. State Talk Groups: State talkgroups are those that are controlled by Kansas State agencies. Some agencies have allowed their talkgroups to be included in the state template for interoperability purposes. Operational use will be directed by the agency controlling the talkgroup.

d. KHP Talk Groups: KHP EVENT talkgroups are included in the state template for interoperability purposes. Any operational use will be directed by the KHP. KHP dispatch talkgroups are no longer included in the state template. Local law enforcement agencies can request access from KHP. Any use will be at the discretion of KHP.

e. Conventional Channels: The conventional channels associated with the State template are national mutual aid channels and are available for use by public safety agencies with no prior permissions needed.

f. Local Talk groups: Local talk groups are controlled by the agency assigned. Sharing of the talkgroups is at the discretion of the controlling agency and must include a Talkgroup Authorization MOU (sample included in appendix).

g. ICS: The talkgroups assigned to the ICS zones are intended for use during an actual event involving multiple agencies. Talkgroups available for on-scene incident communications as per direction of Incident Commander. Assignment of ICS operational channels are through the Statewide Interoperability Coordinator (SWIC)/Kansas Division of Emergency Management Communication Leader. All ICS talkgroups must be assigned previous to use.

h. COMMON: The COMMON talkgroups are available to all users on a first come/first served basis. The intended use is for training and exercise purposes or use for non-emergent events.

Section 5. Contact information: www.kansastag.gov/OEC.asp SWIC, KDOT? KHP?

a. Shared User Agreement: If you need a copy of the SUA to sign, please email: vicki.shanley@ks.gov
b. Talk Group Allocation: www.kansastag.gov/OEC.asp SWIC (Primary)
http://www.kansastag.gov/KDEM.asp?PageID=368 Communication lead (Secondary)
c. Tower Issues: Please report tower issues to KHP Dispatch *47 or ksics_encryption@ks.gov for non-critical issues
d. System Owner: KDOT owns and manages each core and many of the sites on the system. Please email ksics_encryption@ks.gov for questions
e. System Keys: To inquire about an Advanced System Key for radio programming please email ksics_encryption@ks.gov

Section 6: Encryption:

i. ADP or Advanced Digital privacy is a 40bit code that is software driven. The lowest level of encryption available for two-way radio communication.
j. DES or Data **Encryption** Standard is a symmetric-key algorithm for the **encryption** of digital data. Used in LMR for encryption of voice transmission.
k. AES has been adopted by the U.S. government and is now used worldwide. It supersedes the Data Encryption Standard (DES),[7] which was published in 1977. The algorithm described by AES is a symmetric-key algorithm, meaning the same key is used for both

encrypting and decrypting the data. The three key lengths are 128, 192 and 256 bits. The key is alpha numeric with 256 being 64 characters.

i. Interoperability AES Key was developed for the AES Talk group in each regional zone. This key is shared via direct programming of the key loader with all programming shops. The physical key resides with KDOT and SWIC.
ii. Agency/County Key are for each jurisdiction (county) to determine development, ownership, and deployment. Best practice models are available through the Emergency Communication Section.
iii. State AES Template was developed in late 2019 to provide a national interoperability alignment with 20 CKR/SLN assignments through partnership with NLEC. From the 20 assignments a State wide CKR/SLN template was developed for each county and tribal nation in Kansas. Following this template model will ensure the future of interoperability is maintained as more encryption is deployed. Each CKR/SLN is also aligned with the KID. Example CKR 1234 is also KID 1234

l. Key Loader is a device or software that allows a algorithmic encryption key to be loaded into a radio.

Section 7: Talk Group Usage: The Kansas Department of Transportation has set forth under the shared user agreement, policy in which every agency that applied for, received and or uses KSICS talk-groups must follow which includes rules for use, cross-connection, paging and how ownership is defined.

a. Cross Connection:
    i. The connection of a Talk-group to any audio or digitally enabled transmission capable pathway is strictly prohibited without written permission from both KDOT and KHP. Exclusion applies to Dispatch consoles.
b. Paging:
    ii. Paging encompasses an agency using KSCIS talk-groups to tone or alert responders.
    iii. Paging for affiliation
c. Ownership:
    iv. Ownership of the KSICS system is through legislation which identified the Kansas Department of Transportation and its Secretary. State Interoperability Template talk-groups are operationally maintained by KDOT.
    v. Ownership of individual talk-groups is based on the shared-user agreements and system agreements signed by each entity.

Section 8: System Key:

d. Requirements: To obtain a KSICS system key for programming you must complete a certified programming course for the device(s) to be programmed. This must be updated every 24 months. The requesting party must be a LMR dealer, infrastructure owner on KSICS or meet a threshold of devices serviced as defined by KDOT.
e. Smart Key: Shall only be utilized by an individual that has obtained the stated certification completed and on file for review. A smart key shall only be used on computer of software device that is NOT used for connection to the Internet or public Wi-Fi.
f. Soft Key: A Soft Key is defined as any software that allows programming of the KSICS system without a smart key issued by KDOT. Any radio that is found to have been programmed with a soft key will be disabled on KSICS. Individuals in possession of a soft key should delete from all devices and request a smart key for programming.

Section 9: Terms and Acronyms:

ADP	-	Advanced Digital Privacy
AES	-	Advanced Encryption Standard
CAP	-	Compliance Assessment Program
CKR	-	Common Key Reference
DES	-	Data Encryption Standard
DHS	-	Department of Homeland Security
ICS	-	Incident Command System
KDEM	-	Kansas Division of Emergency Management
KDOT	-	Kansas Department of Transportation
KHP	-	Kansas Highway Patrol
KID	-	Key Identification Number
KMF	-	Key Management Facility
KSICS	-	Kansas State Interoperability Communication System
KVL	-	Key Variable Loader
LMR	-	Land Mobile Radio
LTE	-	Long Term Evolution
MOA	-	Memorandum Of Agreement
MOU	-	Memorandum Of Understanding
NLEC	-	National Law Enforcement Center
OTAR	-	Over The Air Reprogramming
SLN	-	Storage Location Number
SUA	-	Shared User Agreement
SWIC	-	State Wide Interoperability Coordinator