Document Title: 4540_p25-cab-issi_cssi_interoperability_test_req-05082019-508

Comment Date: June 5, 2019
Commenter Name or Company: David Prather, L3/Harris P25 Compliance Lab Manager

#	Comment	Action	P25 CAP Explanation
H1	**Section 2.1, sentence 1** "*Mobile subscriber units…*" Since term "mobile" has a specific meaning in the world of LMR and P25 relative to subscriber units, and since consoles can also be used for some testing, we suggest changing the term here to "Mobile, portable, or console subscriber units…" or simply "Subscriber units…" to make it clear that these types of subscribers are allowed. This comment applies to multiple similar instances throughout the document.	Accepted/ CAB will be updated	There is a need to differentiate between subscriber units that are mobile subscriber units and console subscriber units. In Section 1.4 Definitions, 'mobile subscriber unit' will be defined as a Project 25 mobile/vehicular radio unit or Project 25 portable/handheld radio unit.
H2	**Section 2.4, sentence 2** An apparent typographical error: *"Subscriber units that are used in ISSI and CSSI interoperability tests testing shall be able to pass the following test cases defined in [CABC-C] for FDMA and TDMA operation."*	Accepted/ CAB will be updated	The redundancy will be corrected.
H3	**Section 2.4, Table 1 FDMA Test Cases for Subscribers** 2.2.8.4.6 *Emergency Call Request Ruthless Preemption is not a test case that exists within CABC-C. There is a similar test case there, but it only applies to TDMA.*	Not Accepted	2.2.8.4.6 Test Case 6 - Emergency Call Request Ruthless Preemption exists in CABC-C. See page 40 of CABC-C. This test case may be confused with the 2.2.26 Test Suite: Transmitting Subscriber Forced Preemption. It also exists in CABC-C and only applies to equipment that can support TDMA.
H4	**Section 2.5, Table 6. Role combination UR1 row** ISSI arrow appears to be pointing in the wrong directions. (We assume the arrow direction is intended to convey the directions of the initiation.)	Accepted/ CAB will be updated	Yes, the arrow is pointing in the wrong direction. This will be corrected.

#	Comment	Action	P25 CAP Explanation
H5	**Section 3.1, paragraph 2, sentence 2** • The testing of both Inter-System and Inter-WACN connection types is not required to declare product compliance? • An apparent typographical error: "maybe" should be "may be".	Accepted/ CAB will be updated	Only one connection type is required for product compliance. Clarifying language will be added. The 'maybe' will be corrected.
H6	**Section 3.2, paragraph 5, sentence 3** • An apparent typographical error: "chose" should be "choose". • This error is also found in sections 3.3, 4.2, 4.3, 5.2 and 5.3	Accepted/ CAB will be updated	The typographical error will be corrected.
H7	**Section 3.2, Table 14** One of the RFSS tests prescribed is *2.3.1.5.6 SU Roamed Procedure (from serving to home)*. This test case requires that the SU moves from one RFSS coverage area to the other to test roaming. The test does allow this to be simulated, but such simulation would seem to refer to attenuating the RF signal of the first RFSS to simulate moving out of its coverage area and into the other RFSS coverage area, and not to any sort of programming changes, which would change the essential nature and intent of this test. Given the assumption that most ISSI-RFSS testing will be done remotely over an internet/VPN connection with the two RFSS's geographically separated (see our related comment in the general section above), this test cannot be performed. If OIC insists that this test case remain a requirement of compliance, then this single case will preclude the possibility of using a remote connection for all ISSI-RFSS CAP testing. Due to the nature of the equipment involved (at least in the case of the L3Harris architecture), having to transport and set up the required RFSS/ISSI/FNE physically near another manufacturer's RFSS would be quite onerous compared to the prospect of testing over VPN.	Reject/see potential solution	Another commenter suggested the following test methodology for simulating the physical movement from the coverage area of the serving RFSS to the coverage area of the SU home will be added to replace Step c). To simulate the physical movement of SU 1 from the coverage area of the Serving RFSS to the coverage area of the SU Home RFSS, perform the following actions in place of Step c): (1) Have two radios identically configured as SU 1, with one located in the Serving RFSS and the other in SU Home RFSS. (2) Start with SU 1 turned on in the Serving RFSS and the other SU 1 turned off in the SU Home RFSS. (3) After SU1 has registered in the Serving RFSS, turn on SU 1 in the Home RFSS. (4) After verifying SU1 in the Home RFSS has been registered, verify that SU1 in the Serving RFSS has been deregistered. (5) Turn off SU 1 in the Serving RFSS. (6) Turn off SU 1 in the Home RFSS.

#	Comment	Action	P25 CAP Explanation
H8	**Section 4.1, paragraph 2, sentence 3** • The testing of all three connection types is not required to declare product compliance? • An apparent typographical error: "maybe" should be "may be". • These comments also apply to 5.1, paragraph 2, sentence 3	Accepted/ CAB will be updated	Only one connection type is required for product compliance. Clarifying language will be added to 4.1 and 5.1. The 'maybe' will be corrected.
H9	Can OIC explain the reasoning or plan behind there being separate SDoC and STR template for ISSI/CSSI Conformance and Interoperability? We would have thought that ISSI compliance would have worked similarly to CAI compliance; that there would be one product SDOC and STR that declares that all prescribed compliance testing has been passed (both Conformance and Interoperability) and the product is thus CAP compliant.	Clarify	The previous ISSI/CSSI test requirements CAB did have both conformance and interoperability in the same CAB. Because of the lead time for developing the P25 CAP Conformance testing program, it was decided to separate the two test suites. It is generally assumed that a P25 CAP Test Lab for ISSI CSSI Interoperability testing will be available before P25 CAP Test Lab for ISSI CSSI Conformance testing. Additionally, separating enables the ability of a laboratory to do either interoperability or conformance since previously no laboratory expressed interest in performing conformance.
H10	We are assuming that OIC invasions that ISSI testing may be done with RFSS's that are geographically separated, using an internet/VPN connection. We would expect that the vast majority of ISSI interoperability testing would be done this way due to the difficulty in collocating RFSS's from different manufacturers.	Agree	DHS S&T does envision testing with geographically separated RFSS/CSS. However, co-located RFSS/CSS can also be tested.

#	Comment	Action	P25 CAP Explanation
H11	If geo-separated RFSS testing is allowed, then there could be scenarios where it may make sense that each separate RFSS location is manned by a different recognized CAP test lab during the test event. If OIC allows this, then we suggest that provisions be considered for the CAB document and the STR template to address how cooperative testing and reporting between recognized labs shall be done and how to properly capture the test labs joint information.	Accepted/ STR will be modified	The ISSI STR will be modified to allow the listing of multiple recognized P25 Test Labs on the STR document. The ISSI CSSI test case result tabs have been modified to allow the capture of a second test lab DTR number when a second lab is involved with the testing. Both manufacturers will need to submit their own SDOC and STR.

Comment Date: July 19, 2019
Commenter Name or Company: Motorola Solutions

#	Comment	Action	P25 CAP Explanation
M1	Sections 3, 4 and 5 have subsections for FDMA voice services and TDMA voice services. These FDMA and TDMA subsections within any given section appear to have identical text and very similar feature lists and yet there is no mention of expectations for FDMA or TDMA operation of the equipment under test or the equipment used to execute the tests. Using ISSI-RFSS testing as an example, is the expectation that the tests listed in the FDMA subsection require FDMA CAI operation of the RFSS under test and the RFSS used to execute the test and the tests listed in the TDMA subsection require TDMA CAI operation of the RFSS under test and the RFSS used to execute the test? Please clarify the expectation in the document.	Accepted/ CAB will be updated	The test requirements document will be updated to: FDMA testing of the ISSI and CSSI shall use a full rate vocoder for the SU that initiates testing in the RFSS/CSS under test or the RFSS/CSS supporting the testing. A full rate vocoder shall be used by the ISSI and CSSI. The SU that receives the call in either the RFSS/CSS under test or the RFSS/CSS that supports the testing shall receive a FDMA transmission. TDMA testing of the ISSI and CSSI shall use a half rate vocoder for the SU that initiates testing in the RFSS/CSS under test or the RFSS/CSS supporting the testing. A half rate vocoder shall be used by the ISSI and CSSI. The SU that receives the call in either the RFSS/CSS under test or the RFSS/CSS that supports the testing shall receive a TDMA transmission.

#	Comment	Action	P25 CAP Explanation
M2	Section 3.2 (and other sections) states: "P25 CAP has defined certain test cases as 'Required PASS' test cases. 'Required PASS' means that the test case results shall be a PASS if the equipment is to be considered P25 CAP Compliant. Only P25 CAP Compliant equipment will be posted as 'Approved (Grant Eligible) Equipment on the P25 CAP webpage. These test cases have been noted with double asterisk (**) in Table 14." Question – What exactly does "posted as Approved (Grant Eligible) Equipment on the P25 CAP webpage" mean? Does this mean that if a manufacturer has not implemented a feature associated with a "Required PASS" test case, that manufacturer's SDoC/STR will be excluded from posting on the CAP website? Please clarify the expectation in the document.	Accepted/ CAB will be updated	DHS S&T will accept requests for waiver from 'Required PASS' test cases when the manufacturer has not developed the ISSI functionality to support the test case and the manufacturer does not offer a similar non-P25 feature in place of the P25 Standard feature. The manufacturer is required to submit the waiver request via email to P25CAP@hq.dhs.gov. The email shall list the requested test cases to be waived, the reason for the waiver request and manufacturer attestation the manufacturer does not offer a similar non-P25 feature in place of the P25 Standard feature. Once the waiver has been provided, the manufacturer may submit the SDOC and STR for the equipment indicating 'Unsupported' status for the test cases that were waived. After the SDOC and STR are submitted, reviewed and accepted by DHS S&T, the SDOC will be posted on the P25 CAP website and the STR be made available to email requests.

#	Comment	Action	P25 CAP Explanation
M3	Page 18 Table 14: ISSI-RFSS FDMA has 2.3.1.5.6 SU Roamed Procedure clarification. Step c) states "Physically move, or otherwise simulate the physical movement of SU1 from the coverage area of the Serving RFSS to the coverage area of the SU Home RFSS". The CAB should clarify the conditions for simulating the physical movement of the SU between coverage areas because physically moving an SU between coverage areas is difficult to do in a lab environment. We propose text such as this be added: To simulate the physical movement of SU 1 from the coverage area of the Serving RFSS to the coverage area of the SU Home RFSS, perform the following actions in place of Step c): (7) Have two radios identically configured as SU 1, with one located in the Serving RFSS and the other in SU Home RFSS. (8) Start with SU 1 turned on in the Serving RFSS and the other SU 1 turned off in the SU Home RFSS. (9) Turn off SU 1 in the Serving RFSS. (10)Turn on SU 1 in the Home RFSS.	Accepted/ CAB will be updated	Thank you for that language. The following test methodology for simulating the physical movement from the coverage area of the serving RFSS to the coverage area of the SU home will be added to replace Step c). To simulate the physical movement of SU 1 from the coverage area of the Serving RFSS to the coverage area of the SU Home RFSS, perform the following actions in place of Step c): (1) Have two radios identically configured as SU 1, with one located in the Serving RFSS and the other in SU Home RFSS. (2) Start with SU 1 turned on in the Serving RFSS and the other SU 1 turned off in the SU Home RFSS. (3) After SU1 has registered in the Serving RFSS, turn on SU 1 in the Home RFSS. (4) After verifying SU1 in the Home RFSS has been registered, verify that SU1 in the Serving RFSS has been deregistered. (5) Turn off SU 1 in the Serving RFSS. (6) Turn off SU 1 in the Home RFSS.

#	Comment	Action	P25 CAP Explanation
M4	Page 22 Table 17: CSSI-RFSS FDMA test case 2.3.2.5.6 Confirmed Group Voice Call Granted after RF Resources Become Available with the RFSS tested in GC5 role. Section 4.1 indicates the "console equipment" supporting the testing may be either CSS based equipment or a console integrated with RFSS equipment. Note that section 1.4 indicates a console based on CSS equipment has no connection to RF resources. This test case indicates that it shall be run utilizing GC5 and GC8. GC5 requires the equipment supporting the testing (not the RFSS under test) to be configured to have limited RF resource availability. A footnote should be added stating "GC5 is not applicable when the equipment supporting the testing is a CSS (and not an RFSS with integrated consoles) because a CSS has no RF resources." This comment also applies to Page 23 Table 18 (TDMA test cases).	Accepted	The test requirements will be updated with the suggested footnote.

#	Comment	Action	P25 CAP Explanation
M5	Page 22 Table 17: CSSI-RFSS FDMA test case 2.3.3.5.1 Unit to Unit Call with Target Availability Check RFSS Tested in U2U3 role. In the U2U3 role combination the other system connected to the RFSS under tests' CSSI is required to be the group home. When testing with a CSS (and not an RFSS with integrated consoles) it shouldn't be required to be a group home because it has no RF resources. The group home in this case doesn't matter. We suggest that a footnote be added that states: "When testing with the U2U3 role and a CSS, it is acceptable to have the RFSS under test be the group home. This is also true for 2.3.3.5.5 and 2.3.3.5.7. This entire comment also applies to Page 23 Table 18 TDMA tests except for 2.3.3.5.7.	Accepted	The test requirements will be updated with the suggested footnote.
M6	Page 22 Table 17: CSSI-RFSS FDMA test case 2.3.8.5.6 Emergency Group Call Request Queued – No Units Roaming, RFSS tested in GC5 role. As previously stated in the comment on 2.3.2.5.6, GC5 requires the equipment supporting the testing to be configured to have limited RF resources. And when that equipment is a CSS (and not an RFSS with integrated consoles) this is not possible. A footnote should be added stating "GC5 is not applicable when the equipment supporting the testing is a CSS (and not an RFSS with integrated consoles) because a CSS has no RF resources. This comment also applies to 2.3.8.5.8 with GC5 role. Additionally, this comment also applies to the CSSI-RFSS TDMA test cases in Table 18 on page 24.	Accepted	The test requirements will be updated with the suggested footnote.

#	Comment	Action	P25 CAP Explanation
M7	Page 25 Table 20: CSSI-Console FDMA test case 2.3.2.5.12 Group Call Interrupt (Dispatcher Audio Takeover) No Units Roaming – Console tested in GC7 role. GC7 does not seem appropriate for this configuration because (1) it requires the RFSS supporting the testing to have an integrated console (CSU2), and (2) the RFSS/CSS under test requires RF resources for SU1. In fact, when a CSS is under test GC7 isn't applicable because it doesn't have RF resources. It appears that a better choice for 2.3.2.5.12 would be to replace GC7 with GC8. Or, add a footnote that states "When a CSS is under test GC7 is not applicable because a CSS doesn't have RF resources to serve SU1". Additionally, if GC7 is retained a note should be added stating that "GC7 is applicable only if the RFSS supporting the testing has an integrated console to serve as CSU2." This comment also applies to the Table 21 Page 27 TDMA tests.	Accepted	The test requirements will be updated with the suggested footnote.
M8	The comment regarding 2.3.8.5.6 in Table 17 also applies to the CSSI-Console FDMA and TDMA test cases in the GC6 role (Tables 20 and 21). Test cases 2.3.2.5.6, 2.3.8.5.6, and 2.3.8.5.8, when using the GC6 role, require the RFSS/CSS under test to have limited RF resources. As previously indicated, this is not possible with a CSS because a CSS has no RF resources. We suggest a footnote be added for these test cases that states "GC6 is not applicable when the equipment under test is a CSS (and not an RFSS with integrated consoles) because as CSS has no RF resources".	Accepted	The test requirements will be updated with the suggested footnote.

Comment Date: July 22, 2019
Commenter Name or Company: Dwight Smith, EFJohnson

#	Comment	Action	P25 CAP Explanation
E1	Linkage of vocoder modes (radio) to ISSI-ISSI/CSSI conveyance – esp. since legacy mode ISSI (full rate only) is BACA supported		See #4
E2	market use of unit-to-unit call – and the interoperability potential where Availability Check/Direct Call options provided		See #6
E3	testing strategy where 'linked talkgroups' generally supported in customer usage and not dependent on roaming devices		See #5
E4	General Comment Audio data utilized in the ISSI RTP exchanges (per BACA) need not be bound to the audio format utilized by the subscriber devices that are communicating with the RF equipment. Consequently, there seems to be a strong linkage and dependency on the modalities utilized by the radio equipment. This is a restrictive limitation that would seem to be inappropriate for a true ISSI testing treatment. For example, BACA calls for ongoing support for use of legacy IMBE media type (initial full rate media type) for RTP data exchanges. So independent of support for phase 2 (half rate) audio in the RF system the ISSI exchanges can still be BACA compliant for ISSI with appropriate local network adaptation (half to/from full rate conversion). *Note* – if testing of ISSI use of different media formats is the objective of the test report – this should be addressed specifically. It should be recognized that different vendors may have different network linkage or dependencies of audio manipulation internal to their	Accepted/ CAB to be updated	The P25 CAP ISSI/CSSI interoperability testing is based on the ISSI/CSSI test procedures outlined in the TIA-102.CACD-D testing standard. FDMA and TDMA testing applicability is described in Section 1.6.1 of the CACD-D document. The CACD-D document defines which test suites apply to TDMA, Table 2. The CACD-D document defines subscriber unit as well as RFSS configurations to support the test procedures. In Section 2.2.6 SU Configuration, it is stated: "Each test suite defines the SU configurations required for each RFSS Role Combination that is applicable to the test suite. The SU may need to be reconfigured for each RFSS Role Combination because their SU Home RFSS and Group Home RFSS might change from one configuration to another. It may be possible to provision an SU with multiple configurations such that the required configuration can be selected through the SU's user interface. In addition to the SU configurations

#	Comment	Action	P25 CAP Explanation
	system. For example, current EFJohnson ISSI product utilizes the legacy IMBE media format for audio over RTP. The BACA spec preserves this format and interworking requirement. Further, EFJohnson supports phase 2 half-rate where it can be utilized – data manipulation inside the network makes the full-rate IMBE available for conveyance to ISSI endpoints. In our system, each site will decide whether half-rate is usable based on capabilities of the subscriber and network radios involved. This is all independent of the IMBE usage for ISSI.		defined for each RFSS Role Combination, additional configuration steps may be required to ensure voice channels operate as either FDMA or TDMA." If the equipment that directly supports ISSI or CSSI functionality is not capable of TDMA messages, please request a DHS waiver for the TDMA testing. The Test Requirement CAB will be modified to include the process to request a waiver from testing 'Required Pass' test cases.
E5	General Comment As a matter of network interconnect via ISSI (BACA) links, it is quite customary for agencies to share talkgroups (aka linked talkgroups) on an ongoing basis available for the own home subscribers. This fixed linkage is independent of active roamers affiliated to the group from the Home system operating on a Served system. This permits the cooperating agencies to have talkgroups available for multi-agency use for a variety of reasons. It does appear that testing for Group Registrations are dependent on a subscriber initiating such activities wherein the using agencies typically map these shared talkgroups directly and may have issues following a system restart or failover to recover the registrations. This also involves adjunct equipment in some cases.	Clarification	The TIA ISSI/CSSI testing standard (CACD-D) does not define any testing for a Linked Talkgroup configuration. Thus, DHS has not added linked Talkgroup tests.

#	Comment	Action	P25 CAP Explanation
E6	General Comment It appears that the support for Unit-to-Unit calls comes with the optionality of whether the Availability Check feature is supported or not. Given this optionality – it seems that interoperability would be questionable. Given two vendors facing each other over a customer requested ISSI link – what happens if one vendor supports only Availability Check and the Other only supports Direct Call? As the Subscriber Unit configuration is also a factor in whether the feature is invoked, the possibility that roaming subscribers may be incompatible with systems offering just one modality could occur and become generally problematic. Seems that would make the Unit-to-Unit Call service unusable. On a more general note – we have not seen a major clamor for this feature from our customers – and we would nominally expect to hear it as we presently do not provide this feature. It is a very expensive proposition to take an OTA traffic channel and use it for a unit-to-unit voice call. When the two units are in different sites (e.g. on different systems) then you are taking a traffic channel on each. In practical use of a system we do not see this feature being used and would prefer that it be covered as optional.	Accepted/ CAB to be updated	The test cases for Unit-to-Unit Calls is taken from CACD-D testing document. The situation that is defined for the mismatch between systems that support Availability check and those that do not is correct. But there is P25 vendor support for both types of Unit to unit calls and there has been this type multiple test cases of Unit-to-Unit call for Trunked CAI interoperability testing since trunking CAI interoperability test started. The unit-to-unit test case is a required pass, either in the availability check mode or the direct call mode. If the equipment under test is not capable of unit-to-unit call of either type, please request a DHS waiver from the TDMA testing. The Test Requirement CAB will be modified to include the process to request a waiver from testing 'Required Pass' test cases.

#	Comment	Action	P25 CAP Explanation
E7	Re. Section 2.4 this section reiterates that subscriber units are used to drive the testing activities (as previously mentioned explicitly in 2.1, 2.2 and 2.3). There are two tables, nominally differentiated by vocoder modes with expected subscriber capabilities required to support testing the ISSI. These tables differ on three entries (2.2.1.4.2, 2.2.2.4.2 and 2.2.3.4.7). As mentioned previously, the ISSI audio mode does not need to be linked to the audio mode utilized by the radios – why the distinction?	Clarification	The three different entries relate to 'deny' test cases, testing that does not involve a FDMA or TDMA traffic channel, only the control channel. That is why these three test cases only appear in the FDMA table since the testing uses a FDMA control channel.
E8	Re. Section 2.4 The Mobility functions (e.g. driving Unit/Group registration) are similarly somewhat independent of the audio mode used for calls. For example, the Unit Registration CAI (U_REG_REQ) does not specifically associate the audio mode to be utilized – though it does provide info on possible half rate modalities. While interesting, the objective is to test ISSI and not the subscribers. Is it not enough to indicate that subscriber units need to be available that have identifiers for the systems in test environment as covered in section 2.5?	Accepted/ changes to document	The test requirements document will be updated to: FDMA testing of the ISSI and CSSI shall use a full rate vocoder for the SU that initiates testing in the RFSS/CSS under test or the RFSS/CSS supporting the testing. A full rate vocoder shall be used by the ISSI and CSSI. The SU that receives the call in either the RFSS/CSS under test or the RFSS/CSS that supports the testing shall receive a FDMA transmission. TDMA testing of the ISSI and CSSI shall use a half rate vocoder for the SU that initiates testing in the RFSS/CSS under test or the RFSS/CSS supporting the testing. A half rate vocoder shall be used by the ISSI and CSSI. The SU that receives the call in either the RFSS/CSS under test or the RFSS/CSS that supports the testing shall receive a TDMA transmission. The section 2.5 outlines role combinations. It is broken out by ISSI CSSI test cases and is not intended to define the capabilities of the SUs used for testing.