



**Homeland
Security**

Science and Technology

Office for Interoperability and Compatibility

Project 25 Compliance Assessment Bulletin

Project 25 Compliance Assessment Program

Console Sub-System Interface Testing Requirements

P25-CAB-CSSI_TEST_REQ-Draft

Draft 2016

Notice of Disclaimer and Limitation of Liability

The Project 25 (P25) Compliance Assessment Program (CAP) provides equipment purchasers demonstrated evidence of a product’s compliance with a select group of requirements within the suite of P25 standards. The test procedures used to validate these requirements are also part of the P25 suite of standards. Although successful tests will demonstrate P25 compliance for the specific requirements tested, the conclusions drawn from these tests do not apply to every environment or individual users’ needs. P25 CAP-mandated tests only demonstrate product compliance with the test procedures listed in the Supplier’s Declaration of Compliance and, therefore, only attest to a product’s compliance with specific requirements within the P25 Standard.

Revision History

Version	Date	Description
Draft	11/7/16	Initial draft for public comment

Contents

Notice of Disclaimer and Limitation of Liability	ii
Revision History	ii
1 Introduction.....	1
1.1 Scope	1
1.2 Effective Date	1
1.3 Normative References.....	2
1.4 Informative References	2
2 Baseline CSSI Compliance Assessment Requirements	2
2.1 Console Sub-System	2
2.1.1 Performance	2
2.1.2 Conformance	2
2.1.3 Interoperability.....	4
3 Reference of Baseline CSSI Compliance Assessment Tests	8
4 Exceptions.....	8

Tables

Table 1. CSSI Voice Services Conformance Tests	3
Table 2. CSSI Voice Services Interoperability Tests.....	4
Table 3. Console Supplementary Data Services Interoperability Tests	7
Table 4. Reference for P25 Baseline CSSI Tests	8
Table 5. P25 CAP CSSI Exceptions	8

1 Introduction

The Department of Homeland Security (DHS) Science and Technology Directorate's Office for Interoperability and Compatibility (OIC) Project 25 (P25) Compliance Assessment Program (CAP) is a voluntary program that allows P25 equipment suppliers to formally demonstrate their products' compliance with a select group of requirements within the suite of P25 standards. The purpose of the program is to provide emergency response agencies with evidence that the communications equipment they purchase meets P25 standards for performance, conformance and interoperability.

The program requires test laboratories to demonstrate their competence through a rigorous and objective assessment process. Such a process promotes the user community's confidence in, and acceptance of, test results from DHS S&T-recognized laboratories. All equipment suppliers that participate in the P25 CAP must use DHS S&T-recognized laboratories to conduct performance, conformance and interoperability tests on their products. P25 equipment suppliers will release Summary Test Report (STR) and Supplier's Declaration of Compliance (SDOC) documents based on the Detailed Test Report (DTR) from the DHS S&T-recognized laboratory(s) that performed the product testing. This documentation will serve to increase the public's confidence in the performance, conformance and interoperability of P25 equipment.

Performance, conformance and interoperability issues are likely to occur in all communications technologies and especially in ones such as P25 with protocols that constantly adapt to changing user requirements. Users should seek to address such problems with the supplier first, then with TIA TR8.25, and then within the P25 CAP and, notably, before product launch and deployment. Further, the declaration of compliance-related documents developed by program participants will provide useful technical information about the equipment.

1.1 Scope

Federal grant guidance states grant applicants using funds to purchase P25 equipment must obtain SDOC and STR documents posted to the dhs.gov/science-and-technology/p25-cap website. The evidence should show the equipment has been tested based on all of the applicable, published P25 CAP Compliance Assessment Bulletins (CABs) covering performance, conformance and interoperability. This CAB defines these procedures for the P25 Console Sub-System Interface (CSSI).

1.2 Effective Date

This Compliance Assessment Bulletin becomes effective on TBD.

1.3 Normative References

- [1] TIA-102.CACA, *Project 25 Inter-RF Subsystem Interface (ISSI) Measurement Methods for Voice Services*.
- [2] TIA-102.CACB, *Project 25 Inter-RF Subsystem Interface (ISSI) Performance Recommendations for Voice Services*.
- [3] TIA-102.CACC, *Project 25 Inter-RF Subsystem Interface (ISSI) Conformance Test Procedures for Voice Services*.
- [4] TIA-102.CACD-C, *Project 25 Inter-RF Subsystem Interface (ISSI) Interoperability Test Procedures for Trunked Voice Operation Involving the ISSI*.
- [5] P25-CAB-CAI_TEST_REQ, *Common Air Interface Baseline Testing Requirements*. Current version.¹
- [6] TIA-102.CABC-B, *Project 25 Interoperability Testing for Voice Operation in Trunked Systems TIA-102.CABC-B-1*. Note that this addendum is not yet referenced because tests in Time Division Multiple Access (TDMA) mode await P25 CAP Advisory Panel review.

1.4 Informative References

- [7] TIA-102.CACC-1, *Project 25 ISSI Conformance Test Procedures for Voice & Mobility Management Services, Supplementary Data Mobility Management Addendum*.
- [8] TSB-102.CBBK-A, *Project 25 Recommended Compliance Assessment Tests – Trunking ISSI Interoperability*.

2 Baseline CSSI Compliance Assessment Requirements

2.1 Console Sub-System

If a Console Sub-System (CSS) offers multiple service types, and if required tests for different services are the same, the laboratory performing the tests will only be required to perform the duplicative test once.

2.1.1 Performance

2.1.1.1 Voice Services

No tests are defined or required at this time.

2.1.2 Conformance

2.1.2.1 Voice Services

Consoles capable of voice services shall be tested for conformance in accordance with TIA-102.CACC [3].

¹ See [dhs.gov/science-and-technology/p25-cap](https://www.dhs.gov/science-and-technology/p25-cap) for the latest document version.

Table 1. CSSI Voice Services Conformance Tests

CSSI Voice Services Conformance Tests	Normative Test [3]
PCP 6.1.2 Group Registration Procedures	§5
Subscriber Group (SG) Registration – Successful	§5.1
SG Registration – Unsuccessful (Target Radio Frequency Sub-System (RFSS) Not Home to the SG)	§5.2
PCP 6.1.4 Group De-Registration Procedures	§7
SG De-Registration – Successful (Serving RFSS Initiated)	§7.1
PCP 6.2.1 Call Setup for an Unconfirmed Group Call	§9
Group Call Setup – Successful	§9.1
Group Call Setup – Successful (Protected/Unprotected Mode Requested)	§9.9
PCP 6.2.2 Call Teardown for a Group Call	§10
Group Call Teardown – Successful (Triggered by Serving RFSS)	§10.1
PCP 6.2.3 Basic Group Call Transmission Control Procedures	§11
Group Call Transmission – Successful (Serving RFSS Starts and Stops Talk Spurt)	§11.1
Group Call Mute and Unmute – Successful (Home RFSS Initiated)	§11.3
Heartbeat – Successful	§11.5
Heartbeat Query – Successful (Home RFSS Initiated)	§11.7
PCP 6.3.1 Call Setup for a Unit-to-Unit Call	§12
Subscriber Unit (SU)-to-SU Call Setup – Successful (Availability Check Option)	§12.1
SU-to-SU Call Setup – Successful (Direct Call Option)	§12.2
SU-to-SU Call Setup (Protected/Unprotected Audio Call Cannot be Granted)	§12.13
SU-to-SU Call Setup (Called Serving RFSS Does Not have Available RTP Resources)	§12.21
PCP 6.3.2 Call Teardown for a Unit-to-Unit Call	§13
SU-to-SU Call Termination (Calling Serving RFSS Initiated)	§13.1
PCP 6.3.3 Basic SU-to-SU Call Transmission Control Procedures	§14
SU-to-SU Voice Transmission (Serving RFSS Originated)	§14.1
PCP 6.4.3 Home Query Procedures for SGs	§17
SG Home Query – Successful (“Force” Parameter Enabled)	§17.2
SG Home Query – Successful (“Confirm” Parameter Enabled)	§17.3

PCP 6.5.1 Call Control for Confirmed Group Call	§18
Confirmed Group Call Setup – Successful (Radio Frequency (RF) Resources Available)	§18.1
CP 6.5.2 Transmission Control for Confirmed Group Call	§19
Confirmed Group Call Voice Transmission – Successful (Serving RFSS Initiated)	§19.1
PCP 6.6.1 Advanced RTP Resource Management	§20
Confirmed Group Call Setup – Successful (Serving RFSS RF Resources Initially Unavailable)	§20.3

2.1.3 Interoperability

2.1.3.1 Voice Services

A CSS capable of voice services shall be tested for interoperability in accordance with TIA-102.CACD-C [4], and as outlined in Table 4 of the same document. A CSS must be tested against at least three² commercially available RFSSs with a CSSI, where each RFSS is from a different manufacturer. CSSs that are in the same model class shall count as one compatible test subject. A model class is defined by the manufacturer as a product having identical P25 functionality. SU and RFSSs used in CSSI interoperability tests are required to have undergone all interoperability tests in the P25-CAB-CAI_TEST_REQ [5] prior to use in CSSI interoperability tests.

Table 2. CSSI Voice Services Interoperability Tests

CSSI Voice Services Interoperability Tests	Normative Test [4]
Group Voice Call Using an CSSI	§2.3.2
Group Call Granted – Unconfirmed – No Units Roaming	§2.3.2.5.2
Group Call Granted – Confirmed – No Units Roaming	§2.3.2.5.4
Group Call Denied – All Units Roaming and No Units Roaming	§2.3.2.5.7
Heartbeat Verification – Group Call Granted – Unconfirmed – No Units Roaming	§2.3.2.5.9
Group Call Granted – Unconfirmed – No Units Roaming – Home RFSS Initially has Real-Time Transport Protocol (RTP) Resources	§2.3.2.5.11
Group Call Interrupt (Dispatcher Audio Takeover) – No Units Roaming	§2.3.2.5.12
Group Call Routing – No Units Roaming	§2.3.2.5.14
Console Takeover of Another Console - No Units Roaming	§2.3.2.5.15
Unit-to-Unit Voice Call	§2.3.3
Unit-to-Unit Call with Target Availability Check ³	§2.3.3.5.1

² Known as the *rule of three*. In cases where three products cannot be found to test against, suppliers are encouraged to apply to the program for an exception to the rule of three. See also, Section 4, “Exceptions.”

³ The Fixed Network Equipment may support Target Availability Check, no Target Availability Check or both.

CSSI Voice Services Interoperability Tests	Normative Test [4]
Unit-to-Unit Call with Target Availability Check Refused by Target	§2.3.3.5.2
Unit-to-Unit Call without Target Availability Check	§2.3.3.5.5
Unit-to-Unit Call Denied	§2.3.3.5.7
Unit-to-Unit Call Unable to Allow Protected Mode Request	§2.3.3.5.8
Unit-to-Unit Call Unable to Allow Unprotected Mode Request	§2.3.3.5.9
Unit-to-Unit Call Setup Denied Due to Lack of RTP Resources at Called Serving RFSS	§2.3.3.5.10
Broadcast Voice Call Using an CSSI	§2.3.4
Broadcast Call Granted – No Units Roaming	§2.3.4.5.2
Talk Group Registration Using an CSSI	§2.3.5
Subscriber Unit Permitted to Affiliate with New Talk Group – No Units Roaming	§2.3.5.5.2
Subscriber Unit Denied Affiliation to New Group – No Units Roaming	§2.3.5.5.4
Subscriber Unit Denied Affiliation to New Talk Group Because SG Home RFSS and Serving RFSS Configured Differently – No Units Roaming	§2.3.5.5.6
Successful SG Home Query Request with Force Enabled – No Units Roaming	§2.3.5.5.8
Successful SG Home Query Request with Confirm Enabled – No Units Roaming	§2.3.5.5.10
Announcement Group Call	§2.3.6
Announcement Group Call – No Units Roaming	§2.3.6.5.2
Emergency Group Call Using an CSSI	§2.3.8
Emergency Group Call – No Units Roaming	§2.3.8.5.2
Emergency Group Call Request Queued – No Units Roaming	§2.3.8.5.6
Encryption	§2.3.10
Call Privacy for Encrypted Call	§2.3.10.5.1

2.1.3.2 Supplementary Data Services

A CSS capable of supplemental data services shall be tested for compliance in accordance with TIA-102.CABC-B or CABC-B-1 [6] depending on whether the associated RFSS is a Phase I Frequency Division Multiple Access (FDMA) or Phase II (TDMA) trunked system. A CSS must be tested against at least three commercially available RFSSs with a CSSI, where each RFSS is from a different manufacturer. CSSs that are in the same model class shall count as one compatible test subject. A model class is defined by the manufacturer as a product having identical P25 functionality. SU and RFSSs that are used in CSSI interoperability tests are required to have undergone all interoperability tests in the P25-CAB-CAI_TEST_REQ [5] prior to use in CSSI interoperability tests.

Note: General Fixed Network Equipment (FNE) Address:

A source or destination address on the air interface for Supplementary Data may represent the General FNE instead of a specific Unit ID (UID). This allows the initiating SU to send supplementary data

messages to interested infrastructure entities (such as consoles) without knowing their specific address. When infrastructure devices send Supplementary Data they may also use this address as a source address instead of a specific UID. The General FNE address can be any valid UID, the default General FNE address is UID \$FFFFFFC.

Table 3. Console Supplementary Data Services Interoperability Tests

Console Supplementary Data Services Interoperability Tests	Normative Test [6]
Emergency Alarm Operation	§2.2.7
Emergency Alarm – SU to Console	§2.2.7.4.1
Emergency Alarm, Invalid Radio – SU to Console	§2.2.7.4.2
Emergency Alarm, Temporarily Valid Radio – SU to Console	§2.2.7.4.3
Call Alert Operation <i>Note: Substitute a Console for Radio 1.</i>	§2.2.15
Call Alert – Console to SU	§2.2.15.4.1
Radio Check Operation	§2.2.21
Radio Check Successful – Console to SU	§2.2.21.4.1
Radio Check Unsuccessful – Console to SU	§2.2.21.4.2
Radio Detach	§2.2.22
Radio Detach – Console to SU	§2.2.22.4.1
Status Update Operation	§2.2.18
Status Update – SU to Console	§2.2.18.4.1
Status Update No Response – SU to Console	§2.2.18.4.3
Status Query Operation	§2.2.17
Status Query – Console to SU	§2.2.17.4.1
Short Message Operation	§2.2.16
Short Message – SU to Console Destined to a Group	§2.2.16.4.1
Short Message No Response – SU to Console	§2.2.16.4.3
Radio Unit Monitor Operation	§2.2.19
Radio Unit Monitor – Individual Non-Silent – Console to SU	§2.2.19.4.1
Radio Unit Monitor – Individual Silent – Console to SU	§2.2.19.4.2
Radio Unit Monitor – Normal Group Non-Silent – Console to SU	§2.2.19.4.3
Radio Unit Monitor – Normal Group Silent – Console to SU	§2.2.19.4.4
Radio Unit Monitor – Encrypted Group Silent – Console to SU	§2.2.19.4.5
Radio Unit Monitor – Encrypted Group Non-Silent – Console to SU	§2.2.19.4.6
Radio Unit Disable/Re-Enable	§2.2.20
Radio Unit Disable – Console to SU	§2.2.20.4.1
Radio Unit Re-Enable – Console to SU	§2.2.20.4.2

3 Reference of Baseline CSSI Compliance Assessment Tests

To provide further clarity regarding the tests performed based on this CAB, it is important that both public safety and industry reference the tests in a common fashion, especially in STR and SDOC documents. To facilitate this commonality, the following table provides particular set of tests.

Table 4. Reference for P25 Baseline CSSI Tests

Section	Reference
2.1.1.1	P25-CAB-CSSI_TEST_REQ – TBD 2016, Section 2.1.1.1 – Project 25 Console Sub-System Interface Voice Services Performance
2.1.2.1	P25-CAB-CSSI_TEST_REQ – TBD 2016, Section 2.1.2.1 – Project 25 Console Sub-System Interface Voice Services Conformance
2.1.3.1	P25-CAB-CSSI_TEST_REQ – TBD 2016, Section 2.1.3.1 – Project 25 Console Sub-System Interface Voice Services Interoperability
2.1.3.2	P25-CAB-CSSI_TEST_REQ – TBD 2016, Section 2.1.3.2 – Project 25 Console Sub-System Interface Supplementary Data Services Interoperability

4 Exceptions

The preceding sections provide the required as part of the P25 CAP. Exceptions to these test requirements are possible, on a case-by-case basis, at the discretion of the P25 CAP Governing Board. Exceptions will be noted by date, test and — as appropriate — duration in this section of the CAB.

Table 5. P25 CAP CSSI Exceptions

Exception	Date	Details
1	TBD 2016	It is recognized that the initial inclusion of the CSSI into the P25 CAP comes at a time when there may not be enough different manufacturer products available to satisfy the <i>rule of three</i> requirements in Sections 2.1.3.1 and 2.1.3.2. Until such time as there are enough different manufacturer products to satisfy this requirement, manufacturers will be required to test their products against whatever is commercially available at the time of testing. Once the <i>rule of three</i> requirement can be met, this exception will be suspended.