



# Office for **I**nteroperability and **C**ompatibility

## **Project 25 Compliance Assessment Bulletin**

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Project 25

Compliance Assessment Program

Baseline Inter-RF Sub-System Interface Testing Requirements

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**P25-CAB-ISSI\_TEST\_REQ**

March 2010

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## Notice of Disclaimer and Limitation of Liability

The Project 25 Compliance Assessment Program (P25 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. While successful tests will demonstrate P25 compliance for the specific requirements tested, the conclusions drawn from these tests do not apply to every environment or need that individual users may have. 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
First draft	September 18, 2009	Draft released for review.
Second draft	December, 4, 2009	Second draft released for review deleting tests that have been removed from the published standards as well as correcting inconsistencies between the CAI and ISSI CABs.
Release	March 5, 2010	Removed ISSI Voice Services Conformance tests 11.2 and 20.6 based on comments received. 11.2 was removed due to the unusual situation the test case represents. 20.6 was removed due to the unusual situation the test case represents and on-going comment resolution for ambiguity in the protocol standard. Final release version approved on March 5, 2010.

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## 1 Introduction

The Project 25 Compliance Assessment Program (P25 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 are purchasing 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 recognized laboratories. All equipment suppliers that participate in the P25 CAP must use DHS-recognized laboratories to conduct performance, conformance, and interoperability tests on their products. P25 equipment suppliers will release summary test reports and declarations of compliance based on testing from laboratories recognized by the Department of Homeland Security. 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 where protocols constantly adapt to changing user requirements. Such problems should be resolved 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.

The P25 CAP will provide the more than 60,000 emergency response agencies nationwide with a consistent and tractable perspective of P25 product compliance. It will also provide a means of verifying that Federal grant dollars are being invested in standardized solutions and equipment that promote interoperability.

### 1.1 Scope

The SAFECOM *Recommended Federal Grant Guidance* states that grant applicants using funds to purchase P25 equipment must obtain Supplier's Declarations of Compliance and Summary Test Reports posted to the [www.rkb.us](http://www.rkb.us) website. The evidence should show that the equipment has been tested based on all of the applicable, published P25 CAP Compliance Assessment Bulletins covering performance, conformance, and interoperability. This document defines these procedures for the P25 Inter-RF Sub-System Interface (ISSI). Applicable test procedures include tests of all mandatory features and standard options installed in the product contemplated for purchase.

### 1.2 Effective Date

This Compliance Assessment Bulletin becomes effective on March 5, 2010.

### 1.3 Normative References

- [1] ANSI/TIA-102.CACA, ISSI Measurement Methods for Voice Services
- [2] ANSI/TIA-102.CACB, ISSI Performance Recommendations for Voice Services
- [3] ANSI/TIA-102.CACC, ISSI Conformance Test Procedures for Voice Services
- [4] ANSI/TIA-102.CACD-A, ISSI Interoperability Test Procedures for Trunked Systems Involving the ISSI
- [5] P25-CAB-CAI\_TEST\_REQ, Current Version
- [6] ANSI/TIA-102.CABC-A, Project 25 Interoperability Testing for Voice Operation in Trunked Systems
- [7] ANSI/TIA.102.CABC-A-1, Wide Area Roaming Operation

### 1.4 Informative References

- [8] TSB-102.CBBK, Project 25 Recommended Compliance Assessment Tests - Trunking ISSI Interoperability
- [9] Project 25 Statement of Requirements, Current Version

## 2 Baseline Inter-Radio Frequency Sub-System Interface Compliance Assessment Requirements

### 2.1 RF Sub-System

If a Radio Frequency Sub-System (RFSS) 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

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

Table 1. RFSS Voice Services Conformance Tests

RFSS Voice Services Conformance	Normative Test [3]
<b>PCP 6.1.1 Individual SU Registration Procedures</b>	<b>§4</b>
SU Registration – Successful (SU Presence Confirmed)	§4.1
<b>PCP 6.1.2 Group Registration Procedures</b>	<b>§5</b>
SG Registration – Successful	§5.1
SG Registration – Unsuccessful (Target RFSS Not Home to the SG)	§5.2
<b>PCP 6.1.3 Individual SU De-Registration Procedures</b>	<b>§6</b>
SU De-Registration – Successful (Serving RFSS Initiated)	§6.1
<b>PCP 6.1.4 Group De-Registration Procedures</b>	<b>§7</b>
SG De-Registration – Successful (Serving RFSS Initiated)	§7.1

RFSS Voice Services Conformance	Normative Test [3]
<b>PCP 6.1.5 SU Individual Roamed Procedures</b>	<b>§8</b>
SU Roamed Procedure – Successful (Home Initiated)	§8.1
<b>PCP 6.2.1 Call Setup for an Unconfirmed Group Call</b>	<b>§9</b>
Group Call Setup – Successful	§9.1
Group Call Setup – Successful (Protected/Unprotected Mode Requested)	§9.9
<b>PCP 6.2.2 Call Teardown for a Group Call</b>	<b>§10</b>
Group Call Teardown – Successful (Triggered by Serving RFSS)	§10.1
<b>PCP 6.2.3 Basic Group Call Transmission Control Procedures</b>	<b>§11</b>
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
<b>PCP 6.3.1 Call Setup for a Unit-to-Unit Call</b>	<b>§12</b>
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
SU Roaming (Called SU)	§12.23
SU Roaming (Calling SU)	§12.24
SU Roaming (No RF Resources Available in the New Called Serving RFSS)	§12.25
SU Roaming (No RF Resources Available in the New Calling Serving RFSS)	§12.26
<b>PCP 6.3.2 Call Teardown for a Unit-to-Unit Call</b>	<b>§13</b>
SU-to-SU Call Termination (Calling Serving RFSS Initiated)	§13.1
<b>PCP 6.3.3 Basic SU-to-SU Call Transmission Control Procedures</b>	<b>§14</b>
SU-to-SU Voice Transmission (Serving RFSS Originated)	§14.1
<b>PCP 6.4.2 Home Query Procedures for SUs</b>	<b>§16</b>
SU Home Query – Successful (“Force” Parameter Enabled)	§16.2
SU Home Query – Successful (“Confirm” Parameter Enabled)	§16.3
<b>PCP 6.4.3 Home Query Procedures for SGs</b>	<b>§17</b>
SG Home Query – Successful (“Force” Parameter Enabled)	§17.2
SG Home Query – Successful (“Confirm” Parameter Enabled)	§17.3
<b>PCP 6.5.1 Call Control for Confirmed Group Call</b>	<b>§18</b>
Confirmed Group Call Setup – Successful (RF Resources Available)	§18.1
<b>PCP 6.5.2 Transmission Control for Confirmed Group Call</b>	<b>§19</b>
Confirmed Group Call Voice Transmission – Successful (Serving RFSS Initiated)	§19.1
<b>PCP 6.6.1 Advanced RTP Resource Management</b>	<b>§20</b>
Confirmed Group Call Setup – Successful (Serving RFSS RF Resources Initially Unavailable)	§20.3

## 2.1.3 Interoperability

### 2.1.3.1 Voice Services

RFSS’ capable of voice services shall be tested for interoperability in accordance with ANSI/TIA-102.CACD-A [4]. RFSS’ must be tested against at least three commercially available RFSS’ with an ISSI, where each RFSS’ is from a different manufacturer. RFSS’ 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; for instance, a radio model with three keypad configurations would count as one test subject. Subscriber Units and RFSSs that are used in ISSI interoperability tests are required to have undergone all interoperability tests in the P25-CAB-CAI\_TEST\_REQ [5] prior to use in ISSI interoperability tests.

**Table 2. RFSS Voice Services Interoperability Tests**

RFSS Voice Services Interoperability	Normative Test [4]
<b>Full Registration</b>	<b>§2.3.1</b>
Valid Registration <sup>1</sup>	§2.3.1.5.1
Denied or Refused Registration <sup>1</sup>	§2.3.1.5.2
<b>Group Voice Call</b>	<b>§2.3.2</b>
Group Call Granted – Unconfirmed – All Units Roaming <sup>1</sup>	§2.3.2.5.1
Group Call Granted – Unconfirmed – No Units Roaming <sup>1</sup>	§2.3.2.5.2
Group Call Granted – Confirmed – All Units Roaming <sup>1</sup>	§2.3.2.5.3
Group Call Granted – Confirmed – No Units Roaming <sup>1</sup>	§2.3.2.5.4
Confirmed Group Call Granted after RF Resources become available – With Roaming <sup>1</sup>	§2.3.2.5.5
Confirmed Group Call Granted after RF Resources become available – No Roaming <sup>1</sup>	§2.3.2.5.6
Group Call Denied <sup>1</sup>	§2.3.2.5.7
<b>Unit-to-Unit Voice Call</b>	<b>§2.3.3</b>
Unit-to-Unit Call with Target Availability Check <sup>1,2</sup>	§2.3.3.5.1
Unit-to-Unit Call with Target Availability check Denied by Target <sup>1,2</sup>	§2.3.3.5.2
Unit-to-Unit Call Queued with Target Availability check – FNE Implementation checks the availability of the Traffic Channel after Availability Check <sup>1,2</sup>	§2.3.3.5.3
Unit-to-Unit Call Queued with Target Availability check – FNE Implementation checks the availability of the Traffic Channel before Availability Check <sup>1,2</sup>	§2.3.3.5.4
Unit-to-Unit Call without Target Availability Check <sup>1,2</sup>	§2.3.3.5.5
Unit-to-Unit Call Queued without Target Availability Check <sup>1,2</sup>	§2.3.3.5.6
Unit-to-Unit Call Denied <sup>1,2</sup>	§2.3.3.5.7
<b>Broadcast Voice Call</b>	<b>§2.3.4</b>
Broadcast Voice Call – All Units Roaming <sup>1</sup>	§2.3.4.5.1
Broadcast Voice Call – No Units Roaming <sup>1</sup>	§2.3.4.5.2
<b>Affiliation</b>	<b>§2.3.5</b>
Radio permitted to affiliate with new Group – With Roaming <sup>1</sup>	§2.3.5.5.1
Radio permitted to affiliate with new Group – No Roaming <sup>1</sup>	§2.3.5.5.2
Radio denied affiliation to new Group – With Roaming <sup>1</sup>	§2.3.5.5.3
Radio denied affiliation to new Group – No Roaming <sup>1</sup>	§2.3.5.5.4
<b>Announcement Group Call</b>	<b>§2.3.6</b>
Collection of Talk Groups receive call – All Units Roaming <sup>1</sup>	§2.3.6.5.1
Collection of Talk Groups receive call – No Units Roaming <sup>1</sup>	§2.3.6.5.2
<b>Emergency Group Call</b>	<b>§2.3.8</b>

<sup>1</sup> If provided by the manufacturer.

<sup>2</sup> The Fixed Network Equipment may support Target Availability Check, no Target Availability Check, or both.



RFSS Voice Services Interoperability	Normative Test [4]
Emergency Group Call – All Units Roaming <sup>1</sup>	§2.3.8.5.1
Emergency Group Call – No Units Roaming <sup>1</sup>	§2.3.8.5.2
<b>Encryption</b>	<b>§2.3.10</b>
Call Privacy for Encrypted Call <sup>1</sup>	§2.3.10.6.1

### 3 Reference of Baseline Inter-RF Sub-System Interface Compliance Assessment Tests

In order to provide further clarity regarding the tests that will be performed based on this Compliance Assessment Bulletin, it is important that both public safety and industry refer to the tests in a common fashion. To facilitate this commonality, Table 3 is provided as the means by which a particular set of tests will be referred to:

**Table 3. Reference for P25 Baseline Inter-RF Sub-System Interface Tests**

Section	Reference
2.1.1.1	P25-CAB-ISSI_TEST_REQ – March 2010, Section 2.1.1.1 – Project 25 Inter-RF Sub-System Interface RFSS Voice Services Performance
2.1.2.1	P25-CAB-ISSI_TEST_REQ – March 2010, Section 2.1.2.1 – Project 25 Inter-RF Sub-System Interface RFSS Voice Services Conformance
2.1.3.1	P25-CAB-ISSI_TEST_REQ – March 2010, Section 2.1.3.1 – Project 25 Inter-RF Sub-System Interface RFSS Voice Services Interoperability

## 4 Exceptions

The preceding sections provide the tests that are 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 Compliance Assessment Bulletin.

**Table 4. P25 CAP ISSI Exceptions**

Exception	Date	Details
1	March 2010	It is recognized that the initial inclusion of the ISSI into the P25 Compliance Assessment Program comes at a time when there may not be enough different manufacturer products available to satisfy the rule of three requirement in section 2.1.3.1. 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 rule of three requirement can be met, this exception will be suspended.