Project 25 In Action

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This past November marked an important milestone for users of public safety communication equipment, one that brought true interoperability closer to reality. This was the first time that industry-wide documentation of Project 25 (P25) interoperability became publicly available. The documentation, submitted by individual suppliers for models of their P25 digital trunked radio equipment, showed which equipment successfully completed the P25 Compliance Assessment Program (P25 CAP). The P25 CAP defines the methodology to be used by both customers and P25 radio suppliers to determine the degree that one supplier's P25 radios can interoperate, or work, with another supplier's network or infrastructure.

While the users of P25 radios and networks have always had a strong interest in P25 interoperability, most have lacked the scale to drive a standards compliance assessment program on their own.

Developing the assessment program

The U.S. Federal Government is the single largest procurer of P25 networks and currently has more than 100 systems deployed across the Departments of Defense, Homeland Security, Justice and the Treasury. All these agencies have standardized on P25 for their land mobile radio (LMR) procurements, and have deployed hundreds of thousands of P25 radios in the field. Because a standardized definition of P25 interoperability had not existed in the past, each agency — each site — that deployed a network did not have an easy solution to answer the question of multivendor interoperability when procuring radios for their networks.

As a result of this issue, Federal P25 users, working through Congressional action and their representation on the P25 Steering Committee, formally requested that the Department of Commerce's National Institute of Standards and Technology Office of Law Enforcement Standards (NIST-OLES) provide the leadership for the development of a P25 Compliance Assessment Program (P25 CAP). NIST-OLES, along with the Department of Homeland Security Office of Interoperability and Compatibility (DHS-OIC), other interested users and the P25 vendor community joined together to develop the guidelines for the P25 CAP. The goals for P25 CAP were straightforward: Document a rigorous method of ensuring that P25 radios and networks are both compliant with the technical aspects of the standards, and ensure that P25 networks

and radios are interoperable with each other.

Called the Governing board, the P25 CAP has a formal governing body that oversees the execution of the program. This group is comprised of members of the public sector appointed by the Director of DHS-OIC and directs the P25 CAP via the issuance of Compliance Assessment Bulletins (CABs). CABs detail where and how equipment is tested, the minimum thresholds for declaring P25 compliance, and the method for disseminating P25 compliance information.

For example, the Laboratory Assessment CAB requires that both the performance and interoperability test facilities operate within requirements for a quality management system and technical competence for conducting the P25 CAP tests. To ensure that the P25 CAP labs operate in such a manner, the labs are audited by the NIST-OLES representatives and are formally recognized as suitable testing facilities for P25 radio performance and P25 radio interoperability. Only after formal recognition from the DHS-OIC can a laboratory officially begin P25 CAP testing.

Another CAB sets out the minimum performance and interoperability tests that radio and network infrastructure must pass in order for a manufacturer to claim P25 compliance. To demonstrate that P25 radios meet the technical aspects of the standard, each radio model is individually tested in laboratory conditions to ensure it meets key P25 parameters such as digital modulation, power output, receiver sensitivity, etc. To demonstrate interoperability, the model classes of P25 radios must transmit and receive various types of P25 transmissions. To fully demonstrate interoperability, a radio vendor must show that it passes the interoperability tests on three different manufacturers' infrastructures. Likewise, an infrastructure manufacturer must show that at least three different radio manufacturers have passed the tests on its networks.

A final CAB details the requirements for documenting the successful completion of the performance and interoperability tests. When a manufacturer has completed the test process, they provide copies of the test reports along with a Suppliers Declaration of Compliance (SDoC) for each model of equipment tested to the Responder Knowledge Base (RKB), an online repository of information for first responders hosted by the Federal Emergency Management Administration (FEMA). After review, the SDoCs will be posted on the RKB so that users interested in interoperability can determine what equipment has been tested.

Establishing interoperability

Which brings us back to the beginning of this article; by November 2009, many P25 equipment manufacturers should have completed the first round of the P25 CAP cycle. In May 2009, eight performance and interoperability labs were recognized by the DHS-OIC, which allowed testing to begin. During the week of June 22, 2009, the first interoperability test event was held at the Harris Corp. Interoperability Test Lab in Lynchburg, Va. Over the course of the summer, performance testing and interoperability events were conducted at additional manufacturers' labs. As of November 5, 2009, the DHS-OIC began accepting the SDoCs for review and posting on the RKB. Over time, additional (new) radios will go through performance and interoperability test processes, and will be added to RKB on an ongoing basis.

The process for establishing P25 interoperability has been a long and arduous path. This does not mean, however, that P25 equipment only achieved interoperability recently. For the most part, equipment sailed through the P25 CAP interoperability testing because P25 suppliers have been working together to address interoperability issues for years. Many P25 systems in use today use radios from a variety of manufacturers, but the use of multivendor radios on a P25 network has not been easy for network operators. With the emergence of the P25 CAP, selecting radios that interoperate on your network became much easier. And this is good for everyone — users, network administrators, suppliers and the public that relies on effective public safety communications for their protection.

*Paul May, who works as the manager of system marketing for Harris Public Safety and Professional Communications, is well versed on APCO 25 Standards and can be reached via **www.harris.com**.*

*Editors Note: Additional information regarding the P25 CAP and the Responder Knowledge Base can be found at **www.safecomprogram.gov/SAFECOM/currentprojects/project25cap** and **www.rkb.us**, respectively.*