P-25, Some Clarification

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P-25, Some Clarification
Presentation by
Paul Z. Gilbert, KE5ZW,
Texas Dept of Transportation
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- **Question 1:**
  - What exactly is in Phase 2 P-25?
    - The long term goal for Project 25 is to assist users moving from 25 KHz bandwidth to the 6.25 KHz bandwidth which is a 4 to 1 improvement in spectral efficiency and transition to the benefits of digital modulation and technology.
    - This is taking two steps or Phases to achieve; Phase 1 P-25 (12.5 KHz bandwidth using FDMA, Frequency Division Multiple Access technology) and Phase 2 (6.25 KHz bandwidth using TDMA, Time Division Multiple Access technology).
  - [Diagram]

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- **Question 2:**
  - Since it is TDMA, is there a standard which will keep all of the various vendors equipment compatible?
    - Yes, the TIA developed and released TIA-102 as the standard for developing and testing P-25.
    - Within TIA-102, there are two categories of standards documents; the core definition enabling development and testing documents which verify implementation.
    - As of Dec 2010, the TDMA CAI trunking standards for voice communications was defined and approved by TIA.
    - In Aug 2011, the suite of testing documents were completed for the P-25 TDMA trunking voice services and approved by the TIA.
    - Currently, a new version of the TIA-102 standard is in the final stages of approval and will soon be released as TIA-102-B.

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- Question 3:
  - Fire Departments have been complaining about fire ground voice communications using P25.
  - What is being done to address these issues in Phase 1 and 2?
    - The Project 25 Steering Committee approved an enhanced vocoder (both half rate and full rate) that is compatible with previous versions of P25. This enhanced vocoder performs better in high noise environments such as sirens, gas engines running, fire trucks and other high constant sounds.
    - Additionally, vendors have implemented noise reduction features such as dual microphones, and noise reduction DSP in their radios to help voice intelligibility.

- Question 4:
  - How soon will Phase 2 P-25 gain critical mass?
    - There are several Phase 2 P-25 systems being installed now.
    - In Texas, the City of Houston is deploying a city wide system that has 99% coverage in many buildings and control. It will also have a Phase 1 layer for interoperability in the beginning. Harris County (the county Houston is in) will have a Phase 2 system by 2012 and the Harris systems will be interconnected.
    - With the lack of spectrum and the use of 700MHz, the 6.25KHz bandwidth makes Phase 2 very appealing to many agencies.
    - Some vendors are waiting until the entire suite of standards for Phase 2 are developed.
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**Question 5:**
- Will interoperability be compromised because of the mixed systems, that being analog, P-25 Phase 1 and Phase 2?
  - The P-25 standard requires backward compatibility from Phase 2 TDMA to Phase 1 FDMA in a system. There is an optional requirement for backward compatibility from Phase 2 to Phase 0 (analog).
  - However, the continued use of non-standard technologies and features of some legacy systems as well as Phase 1 equipment may raise future issues.
  - This can be as simple as the data rate of the voice channel which in Phase 1 is 8000 bps and in Phase 2 12.5 bps.
  - A point of interest is that while the voice and other data channels is 12.5 bps, the control channel of the Phase 2 systems will continue to be 9600 bps to ensure backward compatibility Phase 1.

**Other thoughts for consideration…**
- Just because Phase 2 is available, not everyone needs to adopt it. User or agency needs should drive the decision to make the jump to Phase 2.
- Be very specific when issuing procurement documents!
- Specifying Project 25 is not enough and the user must remember the P-25 Statement of Requirements does not translate into standards or specifications. Be specific and make conscious, informed decisions on “non-standard” features so future purchases are not impacted.
- Take your time in making the decision to move to Phase 2 of for that matter to Phase 1. These decisions that will be with your agency for a very long time.

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Questions?

Paul Z. Gilbert, KE5ZW / AAR60C
Engineering Specialist III
The Texas Dept of Transportation
Traffic Operations-Radio Operations
Austin, Texas 512-733-3035 / 512-506-5141
paul.gilbert@txdot.gov