

APCO REPORTS



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PROJECT 25: *Action, Activities of Committees*

- User Needs Committee
- Format Task Group
- Data Task Group
- Trunking Task Group
- APIC Committee

EDITOR'S NOTE: The following report on the December Project 25 meeting was prepared and submitted by the APCO Project 25 Steering Committee. The descriptions and opinions used herein are those of the APCO Project 25 Steering Committee report author(s).

The December Project 25 meetings were held December 1 and 2 in Chicago. In this issue of the Project 25 review, we will report on the actions and activities of all the groups that met, except the TR-8.15 Committee. The minutes of that group must be approved by TIA in advance of dis-

INSIDE:

APCO Petitions for New Spectrum

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tribution. However, we will be providing an update of that group's work based on the report the chairman of that group gave to the APCO Project 25 Interface Committee (APIC).

User Needs Committee

The User Needs Committee, chaired by John DiSalvo from the State of Florida, met for four hours on December 2. During that meeting, the Committee considered two proposals for protecting the system control channel. The first proposal was to use encryption for channel protection. The second proposal was to use more conventional solutions. After some discussion, it was agreed that a white paper would be prepared with a more detailed, and more easily understood, comparison of the two proposals. This paper is scheduled to be presented at a future meeting.

The committee then turned its attention to an excellent presentation made by Mark Racek of Ericsson GE on roaming between networks and systems and the problems associated with address management. Based on that presentation, Chairman DiSalvo said he was going to request APIC Chairman Stuart Meyer to schedule a joint meeting between the Trunking and Format Task Groups to resolve the need to make minor modifications to the Common Air Interface (CAI).

The chairman then opened discussion on the Trunking Metrics being prepared by Dr. Greg Stone of Immigration and Naturalization Service and Ed Kelly of Ericsson GE. Although Dr. Stone was absent, it was agreed that a meeting requested by Steven Montealegre of Ericsson GE between Ed Kelly and Dr. Stone should take place prior to the February Project 25 meeting.

Format Task Group

The Format Task Group, chaired by Al Wilson of Motorola, met for two hours on December 1. During that meeting, David Taylor announced that Dr. Stephen Rotheram had left GEC Marconi, so he should be deleted from the Task Group membership. Taylor said he would continue to participate on behalf of GEC Marconi. The chairman also announced that Richard Roley of the State of Georgia would be joining the Task Group.

The chairman then opened the meeting for discussion of the "CAI Operational Description for Conventional Channels." Taylor expressed concern that the document did not currently indicate which parts of the document were "normative," or contain "requirements that would be strictly followed." It was agreed some editing would be done and "normative parts" would include the verb "shall."

The group also agreed to change Section 5, Routing Group Call Procedure, Step 5, to clarify its intent and meaning. They also agreed to add a table clarifying the use of encryption.

As a matter of further clarification, the group agreed to add the term FSSP or Frame Sync Seek Period to the Terminology section and to make a series of report-numbering changes.

Chairman DiSalvo expressed his concern that the data operating procedures in Sections 8 and 9 are insufficiently specified to achieve interoperability. He requested that the term shall be used to reflect their mandatory requirement. Al Wilson said that the procedures were specified that way so the Data Task Group could use them as "normative" requirements. Rich Comroe, Chairman of the Data Task Group, accepted the responsibility for ensuring the "normative" requirements were added to the Radio Data Specifications.

These changes will be made in the revised CAI Operational Description for Conventional Channels, which was scheduled to be mailed in mid-December.

The committee then discussed the need to add four more "Service Access Point Identifiers (SAPS)." It was agreed these values would be added to the revised version of the CAI

Reserved Values document being mailed in mid-December.

The Task Group then considered a proposal being made by Comroe of Motorola on how to resolve conflicts between new documents being written and the existing CAI. He indicated he would be making his proposal to all the Task Groups and then the APIC.

Data Task Group

The Data Task Group, chaired by Rich Comroe of Motorola, met on December 1 for two hours. During that meeting, Chairman Comroe reminded the group that the committee would continue to operate on the 3-2-1 TIA membership rules, which has an automatic voting exclusion if you don't attend the required number of meetings. He also advised the Task Group that Richard Roley would become a voting member at the next Task Group Meeting.

Since there were no IPR issues presented, the chairman opened discussions on Circuit Data Services. He noted that while the "current Data Specification includes both circuit and packet data, they are each separate, and consideration should be given to each of the services independently." He then made a series of presentations on circuit data 'A' interfaces.

After a good deal of discussion, the committee identified the following points:

- "The proposed circuit data is not a continuous transmission service like voice, although there is nothing precluding the proposal of such a service. Rather, it is packaged over the air using the CAI confirmed packet data delivery data-grams."

- "The CAI confirmed packet data delivery data-grams can ... provide just over six Kbps error-corrected and detected payload." This payload does not include the automatic re-try error control. Nor does it include the more efficient ARQ re-try algorithms for long messages. This overhead is carried in the 3.6 Kbps difference between the 6 Kbps in the information Packet and the 9.6 Kbps in the total Packet.

- Define a "super-set" of standard AT command, which allows extension to default to manufacturer-programmed values.

- "It is the simplest service in terms of radio complexity because it leaves network protocols to attached devices, is independent of message sizes being conveyed to and from attached devices, and provides the transparency to communicate any network protocol." According to the discussion in this meeting, it allows the radio to be treated like a modem. It also was indicated this would improve Random Access Memory (RAM) performance.

- "While the circuit service can be employed to maintain sessions to an entire fleet of radios, while transporting packet protocols in the radio-to-fixed network equipment, it would limit transport of packet protocols in repeated or direct radio-radio modes," hence the need for "creating standard for both circuit and packet services."

■ Address Resolution Protocol (ARPing) is being proposed for the packet service and being suggested for the repeated or radio-to-radio applications. In that regard, it may be possible to "define a decimal naming convention for APCO 25 radios to eliminate the need for ARPing for circuit data. However, that does not resolve the remaining issues with ARP with regard to "identification of roamers."

■ There is no definition in the current circuit data specification for a circuit busy. A radio calling another radio already involved in a circuit will react as if there was "no-answer," rather than "busy."

Ed Kelly of Ericsson GE disputes the need for a circuit service in addition to a packet service. The chairman indicated that the need for circuit services can be traced to users' requests and the high-level definition of circuit and packet interface services unanimously agreed upon during the meeting in New Orleans last August. Since no one else had any objections, the Task Group agreed to extend the comment period until January 7, 1994, and discuss it again at the next regularly scheduled meeting.

Next, the committee turned its attention to Packet Data service. Mark Racek of Ericsson GE submitted a proposal for ANSI X3.28 to be used as the link layer protocol for the packet "A" interface in place of the proposed "Point to Point Protocol" (PPP). Racek indicated that the use of the X3.28 protocol would permit the packet services to directly link multiple devices in a vehicle. Further discussions will take place at the next meeting after more comments are received.

Kelly then reported on CDPD and the fact that technical literature defined it as providing half- or full-duplex services. There apparently is disagreement as to whether they are referring to peripheral interfaces or to the rf interface as well.

That discussion led into a discussion as to whether the CAI permitted full-duplex data and under what circumstances. Chairman Comroe reported that the "data specification had intended to permit full-duplex operation as possible, but only in the radio-FNE mode, and not in individual radio units and not in radio-repeated or radio-radio modes." The concept of a "full-duplex, fixed network operation without full-duplex radio units" is creating confusion. Chairman Comroe agreed to prepare a presentation for the next meeting to hopefully eliminate some of that confusion.

Finally, the Task Group apparently agreed to adopt the CAI conflict resolution process proposed by the Project 25 Steering Committee.

Trunking Task Group

The Trunking Task Group, chaired by Rich Comroe of Motorola, opened the meeting and noted there were a number of changes to the minutes of the last meeting. The first change was submitted by David Taylor of GEC Marconi. Taylor advised the chair that Patent 2,069,799 is

assigned to GEC Marconi, not Philips, as the minutes indicated.

Mark Racek also wanted the minutes corrected to reflect the following as it has been officially reported in the Task Group's minutes:

1. Section 7: "The second paragraph of the section states that 'the performance of the control channel is simply what the numbers show ...' This statement is misleading in that it indicates that the performance of the control channel can be analyzed without regard to defining performance. The statement would be more precise if it read the proposed performance of the control channel is based on Motorola's limited set of assumptions which represented the call distribution as 20% non-call overhead and the remaining 80% as group calls. Ericsson GE questioned the applicability of the performance analysis before the users-need specified performance levels were provided. Ericsson GE maintained that the performance metrics used in the analysis did not represent their customers' requirements or traffic profile."

2. Section 13, Ericsson GE's reply to Motorola's comments on our submitted proposal. "I didn't indicate that only the general questions had been responded to. I indicated that EGE had replied to all Motorola comments, but that only the reply to the general questions had been submitted to the task group. Furthermore, Ed Kelly in no way stated that EGE ... would not supply further information or response to the Motorola comments unless the trunking task-group decides to adopt Ericsson GE's proposal as an alternative approach. Instead, Ed Kelly's response was that he felt that since the EGE proposal had been tabled, that the reply to the general comments would be sufficient and that to review the detailed comments would be a waste of the task group's time until there is sufficient interest to pursue alternative proposals which will require changes to the CAI."

Kelly then suggested the chairman nominate a volunteer to take notes during the meeting. Chairman Comroe agreed and indicated that the task of taking notes and chairing a meeting was much too burdensome for one person, although the responsibility of collecting and distributing notes will remain with the chair.

The chairman then gave Mike Sasuta of Motorola an opportunity to give a presentation on ID address hierarchical structure, which in his opinion is consistent with the CAI message units and approved trunked formats. He said it reflects the roaming registration processes contained in the proposed trunking message document.

The following bullets summarize this presentation and its

associated discussions:

- The proposal provides one million Wide Area Communications Network IDs (WACN).
- Allows overlapping coverage.
- Proposal is quite close to the proposal made by Ed Kelly.
- Roaming units would receive comprehensive updates of other sites or subsystems in the same area for faster acquisition.
- Verification of system identification would take place every few seconds, which would be a part of the acquisition time for a unit which had moved beyond the limits of a previously received update.
- Unit retains a single ID in each system, a feature common to both Ericsson GE and Motorola.
- Roaming and registration is defined, while calling procedures between systems are not yet defined.
- Cross system roaming will require Home Location Registers (HLRs), such as can be found in GSM, to accommodate a mobile in one network being known by another network.
- There may be some benefit to providing both positive access (registered units only) and negative access (any unit except excluded units permitted).

Sasuta gave those present a copy of the latest version of the trunking message document, which includes voice, data, status and control service messaging. He noted that this version did not yet include the comments submitted by David Taylor.

The committee then turned its attention to Trunking Formats. Keith Barnes of E.F. Johnson Co. questioned why the proposed format needed 25 bits for ID. Al Wilson responded that two bytes (16 bits) would not be enough, and eight more bits may appear to be too much. However, in his opinion, it is better to have some growth to accommodate future data devices.

Therefore, Motorola believes we are better off allocating a full eight bits now, rather than a half a byte (four bits) and then have to do a reallocation later. Although the debate continued, the chairman exerted the prerogative of the chair and cut off debate, advising the dissenting parties that they need to follow the newly established process if they want to make significant changes to the current CAI format.

The chairman has noted that:

"No alternative formats for 9600 bps trunking or data units have yet been submitted to the format task-group. Yet it is the format task-group that defined formats utilized by all data and trunking task-group's proposals that have achieved the status of a trunking or data task group recommendation. Further, the Trunking Task-Group has previously resolved to employ CAI consistent formats unless demonstrated to not be possible."

Keith Barnes indicated he would provide an alternate proposal for defining the 24-bit ID field, which allocates four bits for extra services.

The Trunking Committee then moved on to discuss how to best protect trunking. Dr. John Gregory of Stanilite declined an invitation to make a presentation, so David Taylor of GEC Marconi provided the committee what he believed would be the cost benefits of using a non-encrypted protection method.

During the discussion that followed, the following points were made:

- No single non-encrypted technique could be employed to protect a user from all threats, such as spoofing, mis-direction or monitoring.
- Some committee members questioned if a non-encrypted technique would protect a user from any of the above-listed threats.
- Federal users indicated they are convinced only encryption will provide adequate protection.
- A number of manufacturers and users expressed concern that a mandatory encryption would drive the per unit price up beyond the average user's ability to pay.

At the end of the discussion, the chairman polled the committee in an effort to establish a sense of the direction the committee should be taking.

In this straw poll:

Motorola voted for a standard with encrypted trunking; Bendix/King, E.F. Johnson, GEC Marconi, Racal, the State of Florida, Sanilite and the FBI voted for a standard with both encrypted and unencrypted trunking. Cycomm, Ericsson GE and MITRE were undecided.

It should be noted that this issue was discussed the following day in the the User Needs Committee where a compromise proposal was drawn up that hopefully reflects everyone's needs.

The compromise recognized the federal government's need to have protection provided by encryption against misdirection, spoofing and monitoring. It also attempts to recognize most public safety agencies will primarily be concerned with preventing unauthorized access, which might be achievable through a non-encrypted technique.

It therefore seemed reasonable to propose a non-encrypted technique as part of the base line standard and leave the encrypted standard as a Project 25 standard option. This entire issue will be reconsidered by the Trunking Task Group at the next regularly scheduled meeting.

Chairman Comroe allowed Mike Sasuta to distribute his revised trunking procedures and David Taylor's comments on those procedures. The committee discussed at length the real viability of the simple re-try limits that had been previously

recommended. The question seems to center around the fact that even though there is agreement that it will adequately control instability in the long-term, there is significant disagreement on its impact for short-term overload.

The committee then turned its attention to the proposal of Cycomm to adopt MPT 1327 as a base line trunking standard. Roger Madden of Cycomm told the group that he thought the adoption of MPT 1327 would allow APCO Project 25 to take advantage of a virtually complete standard, with significant benefit to all concerned.

The discussions of Madden's proposal reflected on the fact that the APCO Project 25 is proposing to use a different bit rate, modulation, message format, sync words and does not require encryption as part of the base line standard. Therefore, a great deal of work would be necessary to match the two standards.

However, David Taylor indicated he saw significant benefit adopting the MPT 1327 specification as the model for the trunking procedures. Keith Barnes agreed with Taylor and offered to assist him in that effort. Dr. Gregory of Stanilite on the other hand disagreed because MPT 1327 originally was designed for older technology and modified to fit as time passed.

APIC Committee

During the APIC Committee meeting, Chairman Stuart Meyer asked George Kameron of Bendix/King to give a report on TIA TR-8 Committee activities. Kameron announced a reorganization of some of the TIA subcommittees and work groups. He also announced a proposal to modify the TIA engineering manual which has proven to be lacking in an environment like Project 25 where the users and TIA are working hand-in-glove.

Finally, he indicated that the CAI was being balloted as a Telecommunications system Bulletin (TSB102BAAA) and that the "Shell Standard" (TSB102) and the Vocoder (IS102BABA) were being published. He also said the

Transceiver Measurements and Methods (IS102CAAA) also is being balloted.

Chairman Meyer then asked each of the Task Group chairmen to report on their activities for that week. After their reports, Chairman Meyer asked Arun Sobti, Vice Chairman of the TIA Land Mobile Section (LMS), to make a few comments. Sobti began his presentation by exploring the Working Group chairmen to complete the PERT charts he had requested within the next two weeks.

He also noted that during the last TIA LMS meeting, it was pointed out the significant amount of time and energy the participants in this project are putting forth to make it a success. They felt the participants deserved some form of special recognition. He also indicated the LMS was particularly concerned about some of the potential problems associated with IPRs. He said a major element is the discovery of what is "Essential" and by whom.

George Kameron added that there is a major concern that some IPRs are not being disclosed.

Sobti then implored the group to "get on with the project." He said, "Let's remove these blocks" ... "time is of the essence" ... "we need a sense of urgency!" Sobti then indicated that from his perspective, the working groups should look for good solutions, even though they may not all be perfect. Obviously the Steering Committee continues to push for the very best practical solutions in its efforts, which are hopefully going beyond just "Good." After Sobti finished his presentation, Richard Roley indicated that ... "in recent presentations to user groups they are asking me what they should do. I sense a high level of frustration and unwillingness to commit without significant output and completion in the Project."

Both Chairman Meyer and Sobti stressed the urgency of completing the Trunking Standards as quickly as possible.

The Project 25 Steering Committee totally agrees with that urgency and would encourage all participants to work as quickly as possible to arrive at a consensus with existing, outstanding issues. ■

APCO Petitions for New Spectrum Allocation

By Robert M. Gurs
Wilkes, Artis, Hedrick & Lane

APCO, along with a number of other private radio user groups, has filed a formal petition asking the FCC to initiate a proceeding to allocate spectrum for private licensing of new emerging telecommunications technologies. This new spectrum could be used for such new public safety technologies as fingerprint and mug shot transmissions to and from the field, mobile video and other high-speed data communications.

The Petition, filed by the Coalition of Private Users of Emerging Multi-media Technology (COPE) seeks up to 70 megahertz to accommodate the needs of "private" land mobile users. The spectrum is most likely to come from the up to 200 megahertz of spectrum that the federal government is required to release for non-federal allocations.

While the FCC already has allocated a considerable amount of spectrum for "new, emerging telecommunications technologies,"

little if any has been allocated for privately licensed systems in which the licensee is also the end user. Instead, nearly all of the spectrum for new technologies has been allocated to services likely to be offered to end users on a commercial basis by "common" or "private" carriers.

The most publicized new spectrum allocation is for Personal Communications Services (PCS). The Commission allocated 160 megahertz for PCS in the 1.8 to 2.2 GHz band, which the Commission previously had designated for "new, emerging telecommunications technologies." While PCS may someday provide a plethora of new communications services to the public, those services will be offered by PCS carriers and will be, therefore, of limited value to public safety agencies.

As the COPE Petition explains, public safety agencies must maintain complete control over their communications facilities and, therefore, cannot rely upon carrier-provided services. Carrier-based systems, such as PCS, will not provide sufficient priority access, control, security, reliability (especially after natural disasters and

other emergencies), or interference protection to meet the specialized needs of public safety agencies.

The COPE Petition complements, but by no means substitutes for, the Congressionally mandated study of current and future public safety needs. The Commission's study must examine how much spectrum will be needed not only for current applications, such as voice dispatch, but also for new public safety communications applications now being developed.

A spectrum allocation for new, privately licensed technologies, with a portion of the spectrum dedicated for public safety use, would assist in meeting some, but certainly not all, of public safety's future spectrum needs. At this writing in early February, the FCC had not yet requested public comments on the Petition, which already has the support of a wide variety of private land mobile users.

Spectrum Refarming Update

Commission action in the spectrum refarming proceeding (PR Docket 92-235), originally expected by the end of 1993, is now unlikely to occur until late spring or summer. There is no official explanation for the delay, which could be the result of the fact that refarming private radio spectrum has been given a lower priority

than higher-profile issues such as cable regulation, PCS licensing, which must proceed pursuant to a Congressionally mandated schedule, and issues related to the "information superhighway."

Hopefully, the Commission staff is also taking its time to make sure that it "gets it right this time," considering the near-universal criticism of so many aspects of its Notice of Proposed Rulemaking.

PCS/Enhanced 9-1-1 Update

APCO's Project 31 is addressing problems related to the ability of wireless telephone services, such as cellular and PCS, to provide full Enhanced 9-1-1 capability. The FCC has urged the industry to adopt Enhanced 9-1-1 standards for PCS and indicated that it will be raising the issue in a separate rulemaking proceeding in the near future. Project 31 representatives have been meeting with industry standards organizations to explain the issue. In late January, Project 31 representatives also met with the FCC's chief engineer to urge the Commission to move forward as soon as possible on its separate proceeding and to stress that the FCC must mandate a basic performance requirement that PCS provide full Enhanced 9-1-1 capability, including automatic location identification. ■

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