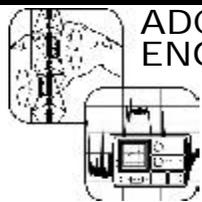


Talk Group



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Vol. 2 No. 3

©September 2003

University of Washington Bothell/Cascadia Community College Campus Repeater Project

—Tom Manley

The University of Washington Bothell/Cascadia Community College campus in Bothell, Washington, has been in operation for a few years now. Over that time, it became clear that the ability for various functional groups and personnel to communicate reliably over the campus and throughout the buildings needed some work.

The facilities are located on a 128-acre campus. Buildings exist primarily along a north-south axis on the western half of the property on a hillside that rises approximately 100 feet east to west over the distance that a number of the buildings (present and future) occupy. Consequently, the buildings are stepped in the hillside so that the western side of the bottom floors are below grade contributing to communication difficulties.

The buildings are of a masonry construction with metal roofing and low emissivity (metal film coated) windows that can impact radio propagation. The UW had been using simplex UHF portable radios and wireless phones for some time with varying success. Like many others, they received a wake-up call during our last earthquake when wireless access disappeared and the limitations of the simplex portables became all too evident. The need for communications to support public safety became the driving force in searching for a new communication system. At the same time, this system should also be able to support daily campus activities.

So, the UW asked, what are the possibilities? There were several considered—remain with the simplex portables and the PCS wireless provider, or another, perhaps augmenting the system; make use of the King County 800 MHz Regional Trunked Radio System (KCRS); or implement an independent, campus-operated, repeater-based system.



Remaining with wireless provided no guarantee of continuous coverage. Even if the coverage was augmented by the use of in-building amplifiers, the schools still would depend on an outside vendor to maintain capacity so that service would be available in times of a regional emergency. Not a likely prospect from a profit-oriented vendor and understandably so.

KCRS actually has a radio site very close to the campus just to the southwest. However, the orientation of the campus was such that the KCRS site could be shadowed by the hillside of the campus. Along with that, the cost of radios and subscription to the KCRS system held no advantage over independent ownership of a radio system.

THE LIGHTER

SIDE

Life Beyond Fifty

- The Cardiologist's diet: if it tastes good, spit it out.
- Maybe it's true that life begins at fifty. But everything else starts to wear out, fall out, or spread out.
- There are three signs of old age. The first is your loss of memory. The other two I forget.
- You're getting old when you don't care where your spouse goes, just as long as you don't have to go along.
- Middle age is when work is a lot less fun and fun a lot more work.
- Statistics show that at the age of seventy, there are five women to every man. Isn't that the darndest time for a guy to get those odds?
- You know you're getting on in years when the girls at the office start confiding in you.
- Middle age is when it takes longer to rest than to get tired.
- By the time a man is wise enough to watch his step, he's too old to go anywhere.

Thinking About ...

Contractor Management Principles

Submitted by Dean Hane

As the project manager for your agency's communications upgrade, you have been tasked with bringing it all together. You are in charge of getting the bids out, procuring equipment and services, implementing the system, and of course, contractor management. This can be a tedious task that can range from something as small as getting a new lock installed at the site to something as large as building the site itself. Oh, and if there are multiple sites, just multiply the time required on your part. Fortunately, you're not the first person or project team to go down this road and there are several roads to success.

A wise police chief once told me to "plan your work and work your plan." To that end, contractor management begins with the end in mind. Armed with this philosophy, you are now ready to start the project rolling. There are a variety of different contractors such as civil, construction, technical, and professional—so understand how their particular expertise fits in with the project. Most contractors want to perform well for the customer, otherwise they are out of business in short order.

Sit down with the contractors before any work starts to review the plans in detail. Your life and theirs will be much better if there is a clear understanding of the beginning and the end of their tasks, sometimes known as contract demarcation. Some RFPs are written to allow flexibility or options in the use of materials or in the technique of implementing the system, so make sure these items are discussed in detail and there shouldn't be any surprises. Mistakes may be made, but as the project manager your job is to handle them and keep things moving. If a contractor does error, it is your responsibility to follow up, point it out, and have them correct it. For some, confrontation can be difficult but the earlier it is handled the easier it is. Do not be afraid to stick up for your project, since it is often

more productive to have bad conversation than no conversation.

Establish a single point of contact with the contracting firm. Select one person who is in charge of their end of the project that you can go to for questions, issues, and answers. Talk with them frequently, daily if necessary, in order to keep current and be clear about the process. A good idea is to schedule regular project update calls at least once a week. Problems are much easier to solve when they are small.

Make sure the schedule is set. In today's world, time is money and we must often adhere to timelines, particularly as they relate to budgets. Most projects depend on several facets such as construction, implementation, turn-up, and acceptance so tasks must be completed in a certain order. The schedule is critical in order to move from one phase of the project to the next, so it's important to stay on top of it. With that said, there are events that are out of your control so make sure you notify the customer, the boss, or the rest of the project team if the schedule looks like it will slip.

Managing multiple vendors compounds the time you will spend handling the project. In many cases, one contractor cannot begin until the previous one finishes, or there may be multiple vendors working at the same location at the same time. Be sure to avoid finger pointing between contractors and if the issue comes up, all parties need to discuss the situation to determine the resolution. The contract or the RFP is the defining document when there are questions about project responsibilities. As the project manager, you will be responsible for enforcing the contract requirements.

Many of these principles are basic and most project managers understand them individually, but all of them need to be applied together in order to succeed. Don't lose your vision when swamped with many tasks. Keep these simple principles in mind when you are managing contractors.

UW Bothell/Cascadia

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It was decided to research a self-contained campus repeater system.

The initial problem was to quantify the radio performance required. What was needed to get reliable talkout, and especially talkback, over the entire campus and every nook, cranny, and windowless equipment room? A repeater held the promise of very good talkout since the signal source could be situated with some altitude to illuminate the entire campus and to project higher power, if needed, than a portable could muster. Likewise, talkback from the weaker portables would be enhanced by the repeater receiving antenna also being placed to overlook a large area. Could a typical portable then be heard by a repeater receiver from all the problem areas on campus?

The campus was surveyed and a spot chosen that was a likely location for a repeater antenna. A mobile radio was used to simulate a repeater and a unity gain omnidirectional antenna mounted on a temporary pole just above the roofline of a centrally located building. With this advantageous placement for reception, it was determined that talkback could be achieved even from the dark recesses of the campus reliably with as little as 0.5 W.

This placement had another advantage. Since talkout should be reciprocal, the campus could be covered with relatively low repeater transmitter power. 5 W ERP was chosen for the transmitter power. Although the campus is above Line A, this meant that coordination with Canada was not required, which greatly shortened the licensing time. Also, it eases the safe harbor aspects of tucking ourselves into the crowded UHF band.

Next was the question of the type of repeater system to use, a 1- or 2-channel open repeater perhaps, a community repeater with

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tone or digital access restrictions, or an LTR-type trunking system. A survey of users on the campus was done. Fortunately, a program manager from the University was available with an excellent sense for organizing the functional needs of the campus and those needs were well described to ADCOMM and Action Communications, the installer and initial programmer of the system. Public Safety, a driving force behind the project, had specific needs for campus-wide pre-emptive access as well as private communication. Telephone interconnect was required for Safety to use after hours when no dispatcher would be available. The campus project manager identified approximately a dozen major talkgroups to support each with a number of subgroups and requirements for communication across talkgroups. And, of course, there was the separate entity of the Community College and their needs.

A 3-channel LTR system was installed using Kenwood repeaters, portables and mobiles, and Zetron Model 459 LTR controllers. While a seemingly modest system, it is quite capable of handling the talkgroups that blossomed on campus and has some inherent redundancy and room for growth in the three repeaters. The system was also implemented with a DC power supply and sufficient battery capacity for 8 hours of operation in the event of prolonged utility failure.

The schools are pleased with the system performance, which has provided reliable and full coverage over the campus. In its first month, the system has also proven its mettle with several emergency situations as well as the daily support of normal activities.

WITTY WORDS OF WISDOM—

“The rung of a ladder was never meant to rest upon, but only to hold a person’s foot long enough to enable them to put the other somewhat higher.”

—Thomas Henry Huxley

The Last Byte

CONTINUED FROM PAGE 4

me the most “interoperability?” The answer? Analog VHF FM. Without a doubt.

What problem is APCO Project 25 trying to solve? How can moving to a digital platform help to improve interoperability when everyone around you is analog? What is wrong with analog VHF FM? Now all that said, if APCO Project 25 could result in a trunking system standard that would allow multiple vendors to provide subscriber equipment and compatible trunking infrastructure, then that is great. Since most of the trunking systems operate at 800 MHz, the radios will be operating on the same band. Now I agree that to go to 6.25 kHz channels, we will need to abandon analog FM. However, most of the United States will not need the extra capacity for many years to come and many of the urban areas will have deployed 800 MHz and 700 MHz trunked systems. We haven’t even made efficient use of the 12.5 kHz channels we already have.

I have yet to hear a satisfactory explanation of why APCO Project 25 digital radios are more interoperable than existing VHF or UHF analog FM systems. My concern is technical decisions are being made by nontechnical policymakers who hear the buzz words without understanding what they are implementing. I have heard people say that an APCO Project 25 radio can work on all bands and all trunking systems, otherwise how else could it provide interoperability? They were quite surprised when it was explained that a VHF Project 25 radio would not talk on the neighboring 800 MHz trunking system. So, next time you hear the Project 25 mantra, ask yourself, who benefits? Do you really benefit? Does the equipment supplier benefit? Do the taxpayers you provide service to benefit? How can moving to a digital platform really provide interoperability when your neighbors are still on analog FM? I know, I know, someone will say, “But digital is the only format that will work on the new 6.25 kHz channels.” That is not exactly a true statement. But digital probably provides the best alternative. Ask the salesperson to guarantee the radio you buy today will work on the 6.25 kHz channels. Ask who can service the digital radios or ask your own service agency if they have all the digital test equipment and skills required. Ask the vendor if you can buy their base stations and

someone else’s voting equipment. Do not assume all functions in all Project 25 radios will work across the different vendors’ equipment.

Just think how silly it would look if many thousands, hundreds of thousands, or millions of dollars were spent on a system and some rookie cop said, “Nobody else can talk to us.” Remember, technology is not the difficult part of interoperability. Procedures, training, policies, and cooperation are all required first. Getting two radios to be able to communicate is actually the easiest part. Project 25 won’t help with the organizational challenge of interoperability.

—Joe Blaschka, Jr., P.E.

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THE LAST BYTE

This is Interoperability? Or the Emperor Has No Clothes.

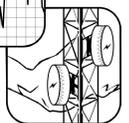
“Look the Emperor has no clothes!” said the small boy who naively spoke the truth everyone else was afraid to admit. As a kid, I remember reading the fairy tale about the Emperor who had no clothes. I thought how dumb, the leader of a county and he could not tell he was being bamboozled. I suppose we have all succumbed to the lure of something that didn’t seem right but it came

from “experts” so it must be true. For those of you not familiar with the story, an Emperor ordered a new set of clothes and the tailor, being an unscrupulous fellow as well as a great con man, decided to take the money and only pretended to make the clothes telling the Emperor how great they looked. The Emperor not wanting to seem foolish did not question this great tailor. When he asked his servants, “How do I look?” they didn’t want to disagree with the king so they said how great the clothes looked. This charade continued even when the Emperor went walking down the main street. The townspeople did not want to seem foolish

if they were wrong so they all agreed the new clothes were beautiful ... of course they were his birthday clothes ... finally a small boy yelled out, “Look the Emperor has no clothes!” and they all looked pretty foolish.

This story comes to mind when I hear about APCO Project 25 and interoperability. Today, if I needed communications anywhere in the United States, what radio would give

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