

Building Broadband During Component and Worker Shortages

Completing broadband builds requires competent fiber optic techs, but training them requires understanding how they learn.

By Jim Hayes / *The Fiber Optic Association*

It's now apparent to almost everyone that broadband internet is a necessity, not a luxury. Work, education, health care and social interaction are online activities that require high-speed broadband internet. Broadband's value came into clear focus during the past year and a half, when it lessened the impact of the pandemic on the economy. Now, providing broadband to more people is a priority, especially in rural and low-income urban areas.

It's evident that despite the hype about 5G and low-Earth-orbit satellites, only fiber optics can deliver the infrastructure broadband requires. 5G will happen only in urban areas where it is economical, and satellites are incapable of actual broadband speeds. (They disrupt astronomy too.)

The problem with building out broadband to cover underserved or unserved areas goes beyond money. Governments realize the need and are allocating funds to broadband. However, two immediate problems remain: the lack of components, including fiber optic cable, and the lack of skilled workers.

I've read several articles about the need for more fiber techs recently, many by people seemingly unfamiliar with either the broadband industry or training. Most of the writers do not seem to understand how the industry works and how techs get trained. I want to share what I've learned from almost 40 years of training fiber techs with the hope that the information helps others understand how to train effectively.

Above all, remember this: There is no silver bullet to solve the fiber optic tech shortage, and it won't happen overnight. Intimate knowledge of the industry, the workers and educational practices are necessary. So are hard work, money, and patience.

WHAT DO FIBER TECHS DO?

Many people refer to fiber techs as "splicers," imagining them working for a telco out in the field, splicing fibers on a long-haul network. Although there are still a lot of those workers, building fiber networks is a lot more than splicing. Installation techs need to know how to install fiber optic cable on poles or underground, install hardware, splice and terminate fibers, and test and troubleshoot problems.

Some techs work for contractors, and many live nomadic lives, traveling from job to job, changing each time a project is finished. Other techs work for different types of companies and organizations, including private companies, local phone and electrical utilities and government agencies. They install and maintain fiber optic networks their employers use. Most also perform other work for their employers in settings such as IT networks, data centers, wireless networks, industrial facilities, electrical grids, traffic control systems, water treatment plants and hundreds of other fields.

Employers might ask any of those techs to help build broadband networks. In cities and small towns, municipal employees often develop

fiber optic networks. In urban and rural areas, all electrical utilities currently use fiber, and some, mainly rural electrical co-ops, are already building broadband networks.

HOW DO TECHS LEARN?

How do techs learn about fiber optics? In my experience, many who already work in a tech field take a “boot camp” course in which they learn what they need to know about fiber optics and then, in hands-on labs, learn some basic skills, such as cable preparation, splicing, termination and testing. Those who complete the Fiber Optic Association (FOA) certified fiber optic technician (CFOT) certification show they have acquired the basic knowledge, skills and abilities (KSAs) that the FOA expects of fiber optic technicians.

But people do not become skilled technicians after a short boot camp course. They need experience to apply what they learn to their particular jobs. That’s called on-the-job training (OJT). Give a tech a couple of years, and he or she will become a skilled worker. I’ll discuss OJT more below.

Most technical high schools and colleges offer continuing or adult education courses using the FOA curriculum. Few have academic fiber optic courses, but they integrate fiber optics into an IT or a telecommunications curriculum to meet educational goals and accreditation.

One college course that has been quite successful is taught in Kentucky Career and Technical College System (KCTCS) schools, where the FOA helped start programs to train entry-level techs for the Kentucky Wired program. Kentucky decided to build its statewide fiber optic backbone to connect all 95 county seats and open the network to private or public/private organizations to provide communications services. The FOA already had one school in the KCTCS system, so it worked with the state to create eight regional training centers, providing the curriculum and training instructors and helping the centers get started. The FOA offers a comprehensive online training program for instructors, although some attend in-person training



courses it offers each year at locations such as the International Brotherhood of Electrical Workers (IBEW) National Training Institute.

KCTCS was a suitable venue for this program because many students needed remedial education before tackling the intensive FOA curriculum, which assumes 10th-grade capabilities. Some students were laid-off coal miners. Today, KCTCS turns out techs headed straight to work for the contractors building Kentucky Wired for their OJT.

Apprenticeships offer the best way to train techs, but managing such a program can be difficult. It’s a lot more complex than just training. Apprentices must be employed in the field daily and attend training after hours. Managing the combination of schools, employers and instructors can be daunting.

The IBEW and the National Electrical Contractors Association (NECA) run the most successful fiber optic apprenticeship program. FOA has been working with IBEW and NECA on this program for its entire history – 25 years. They use the FOA fiber optics curriculum and even publish their version of the FOA textbook.

Today, 34 Joint Apprenticeship and Training Committee (JATC) centers for the IBEW/NECA apprenticeship program teach the FOA CFOT curriculum. The FOA trained and certified all instructors and works closely with them to ensure the program’s quality. IBEW and NECA

make apprenticeship work right; the FOA knows all the instructors and many students, and their competence is impressive.

Some techs never take a formal course. Suppose a technician is already a skilled worker who installs copper cabling for IT networks, security systems or CATV. In that case, he or she can learn about fiber optic installations by reading a book, taking an online course or watching a few videos. A co-worker with some fiber experience can guide technicians who want to get into the fiber optic installation field. That’s another aspect of OJT training.

TRAINING IN A PANDEMIC

The pandemic impacted the training of fiber optic workers just as it did all education. Most schools in the worldwide network of FOA-approved schools were unable to offer in-person classes for months. Some schools training essential workers developed classrooms that facilitated social distancing, separating worktables and installing plexiglass dividers between students.

But just like most schools and colleges, fiber optics turned to online training. The FOA had been offering online self-study courses for many years. Fiber U, the FOA website, has more than two dozen free, online, self-study courses, from the basics of fiber optics to advanced topics such as fiber optic testing and fiber to the home.

INDUSTRY ANALYSIS

Many schools use Fiber U in blended learning courses to allow students more time for hands-on labs when they attend a class in person. The FOA experimented with online remote labs with several schools, but achieving acceptable results using skills exercises performed through video conferences didn't prove easy.

Professionals applying for certification based on experience (the FOA calls it "Work to Cert") who need a study guide for FOA certification exams also use Fiber U.

Many contractors had plenty of work and needed more workers. They, too, reached out to the FOA, which offered assistance with OJT because most work skills are developed with practice through mentoring by more experienced co-workers.

Contractors often start new workers off with a short boot camp training program, either in-house or at a formal

training organization such as one of the schools in the FOA network. During the pandemic, that was not possible, so online training filled the void.

The FOA worked with contractors to develop a structured OJT program, combining online study at Fiber U with work experience. Everybody starts with an online basic fiber optics course on Fiber U. There, they gain background knowledge, learning skills from their mentors and the Fiber U Basic Skills Lab tutorials and exercises.

TRAINING NECESSARY WORKERS

The broadband industry has a large potential workforce between the current fiber optic contractors and workers in other fields doing fiber optics. Contractors need to focus on improving the competence of their workers by encouraging them to use online resources to enhance their OJT.

That holds for their own workers and those who work for subcontractors.

The broadband industry surely needs to recruit more young people and women to join the fiber optic tech workforce. Doing so requires a change in mindset. Many contemporary businesses need new workers, not just fiber optics but also electrical, plumbing and construction trades. Work in these areas recognizes certifications more than college degrees, and pay is much higher than it is for delivery drivers or baristas.

Let's get the word out and recruit the next generation of workers to build the world. ❖

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