Fiber Optic Association Coordinates FTTH Training

Technicians with Outside Plant experience can learn FTTx in just a few days, at 150 training centers

By Jim Hayes ■ *The Fiber Optic Association*

For all of the 25-plus years I have been involved in fiber optics, the "holy grail" has been fiber to the home. Long distance telecom was the first application to be converted to fiber, simply because fiber's bandwidth capability over great distances made it much less expensive than copper, microwave or satellite communications.

As fiber volume grew, it became more cost-effective for shorter links, and metro networks were converted. Large buildings or businesses with high telecom needs came next and many were converted to fiber during the telecom/Internet boom of the late 1990s. Now fiber to the home is finally becoming both technically feasible and cost-effective. It is often a requirement to satisfy customer demands for new services and keep up with competition.

Wanted: FTTx Technicians

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stall FTTx networks has become a gating item as hundreds of FTTx projects come online. Unlike large projects such as long distance or metro networks that keep a small crew busy for weeks, FTTx involves relatively short projects that can keep numerous crews busy working in a small geographic area such as a neighborhood or subdivision.

The Fiber Optic Association (www.thefoa.org) became aware of

this problem in late 2005 when FTTx installers came to the FOA asking for help in finding technicians capable

of doing FTTx installs. Next we received calls from Verizon, also looking for appropriately trained techs. With 150 FOA-approved schools certifying thousands of CFOTs (Certified Fiber Optic Technicians) each year, we were an obvious source of capable technicians. As we talked to these companies, we realized that we could greatly improve their efficiency by creating standards for teaching technicians in the FTTx specialty.

That was a perfect task for The FOA. We are a non-profit professional society founded in 1995, and chartered to promote fiber optics through education, certification and standards. FOA-approved schools include technical schools and colleges, professional trainers and major suppliers of fiber optic products like Corning and AFL. We offer certification programs

What's In A Typical FTTx Training Course?

Between the different FTTx architectures in use and rapid technology changes, creating a FTTx curriculum can be difficult. For training companies with customers already involved in FTTx programs, developing a curriculum is easier, as the customer dictates what the program must cover, often right down to the specific installation equipment and products being used.

Manufacturers like Corning or AFL have programs that focus on the use of their products by their customers. For schools incorporating FTTx in their telecommunications degree programs, virtually everything involved in the technology and applications must be covered in both classroom and laboratory sessions.

Most FTTx courses are covering just the specifics of FTTx. Experienced technicians will just need to learn these specifics. Students learning to be installers or technicians must first learn the basics of fiber optics and the hands-on practices of cable pulling and preparation, splicing and termination in other classes oriented to outside plant (OSP) installation before being trained in the installation of FTTx. Some students taking FTTx classes are not going to be installers, but will do system turn-up and troubleshooting or provide customer support, so they do not need the installer-level knowledge and skills. All can take a separate FTTx class that covers what FTTx is, why it is just now being implemented, and what architectures and equipment are being used.

Allowing several approaches can streamline the process of training personnel. While an OSP fiber optic installer course can take one or two weeks of full-time training to impart the knowledge and skills necessary to successfully install fiber optic networks, a FTTx-only course can be taught in two days or three or four evenings. Experienced personnel needing only an "upgrade" to FTTx or who only need to know the basics, not installation practice, can be trained offline, without affecting current job productivity.

The FOA program has all these approaches covered, as we provide the standards and reference materials for the FOA CFxT certification separate from our technician certification, which our approved schools use in the development of their own programs aimed at their specific customers' needs.
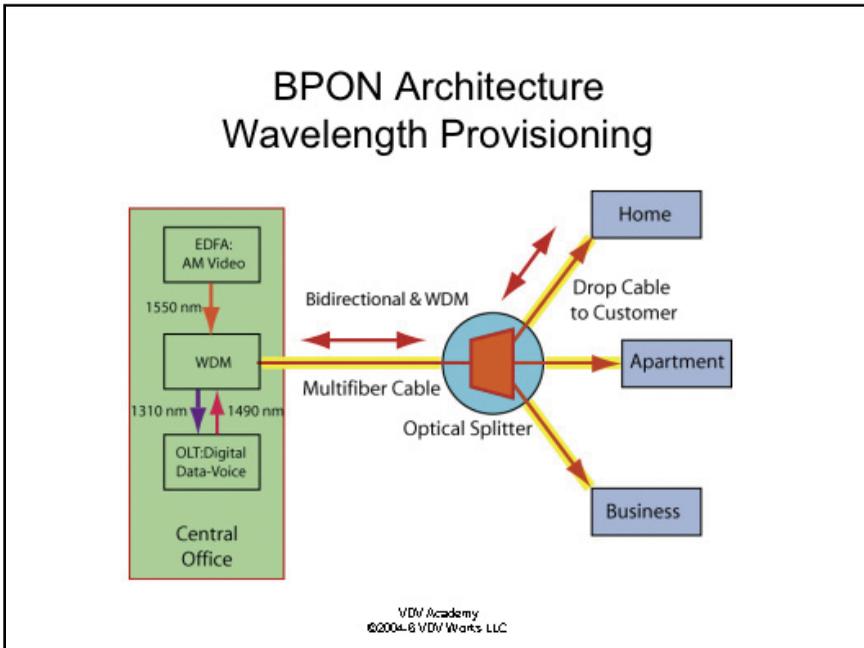
Snapshot of A Moving Target

As of 2005, we had many schools that had been teaching fiber optics installation for years in our group. But few were yet proficient in FTTx. And, of course, FTTx is a moving target, as implementers experiment with topologies and as new technology develops.

The FOA must have definitive references for our schools to use in their training and for our certification programs. We wrote our own textbook using the inputs of experienced installers and instructors, which had just been updated to the 3rd edition, unfortunately just missing the rapid adoption of FTTx.

We needed to have a FTTx reference. That turned out to be easier said than done, as FTTx is still a work in progress. Fortunately, our Boards of Directors and Technical Advisors include many experienced people who have lots of contacts in the industry. At the FOA, we began a long process of reading every article we could find, interviewing industry experts, gathering white papers from vendors, and, in the process, benefited from the timely publication of several books on the subject.

As FTTx is a moving target, we took a snapshot of the current activity and created an annotated slide presentation to be given to our schools as the basis of their training and the FOA Certified FTTx Technician (CFxT) FTTx certification program. Providing the reference material for our certification in the form of an annotated slide presentation shortened the time for our schools to begin teaching a program.

The diversity of opinions today on what version of FTTH/FTTP/FTTC is proper for any given project made developing training materials more complex. And FTTx involves some different skills compared to traditional OSP installations, depending

at both basic and specialist levels.

The FOA is not a training organization, however. We develop standards for training, administer certification programs and even have our own published textbook, *The Fiber Optic Technicians Manual* from Delmar Learning. But our schools develop their own training programs. Some teach OSP (outside plant) installation, some premises or structured cabling, some only military, some only teach their own employees, depending on their customer needs.

BPON Architecture
Wavelength Provisioning

The FOA created a complete annotated PowerPoint presentation on FTTx to jumpstart schools' training programs.

Recruiting FTTx Personnel Or Finding A School Offering FTTx Training

The FOA offers several free services to assist in the training and hiring of FTTx personnel. We have been posting job openings in the online monthly newsletter on our website (www.thefoa.org/foanewsletter.html), including links to hiring companies' recruiting Websites. We welcome companies to contact us with their needs, as we not only post these opportunities, we also contact our approved schools to have them inform their students.

The FOA also lists all certified schools on its Website (www.thefoa.org/foa_aprv.htm) and encourages companies seeking qualified applicants to work with the schools directly to meet their needs. Often the school will be able to modify training to exactly meet the company's staffing issues.

Finally, the FOA has a free online searchable database of installers, contractors and consultants that helps users find qualified personnel and companies, at www.thefoa.org/index_installers.html.

on the installation methods chosen. Traditional telco OSP installs have one crew pulling cable, one splicing and maybe even another testing, then a final crew "turning up" the equipment. Members of a FTTx crew are often expected to do all this themselves to keep costs to a minimum.

Meeting Industry Needs

Discussions with those in the industry also led to a realignment of the focus of the training and certification. Rather than try to cover all the fiber optics associated with FTTx installations (cables, terminations, installation, testing, and so forth), we made the CFxT certification cover only FTTx, including marketing issues (why FTTx now), technology, network architecture, and installation. Techs would have the FOA basic fiber optic certification, CFOT, as a prerequisite. The program could then be used to train not only techs, but also non-technical personnel, such as customer service representatives who need to understand FTTx in more depth to deal with today's tech-savvy homebuilders and consumers.

Once the materials were in draft form, they had to be circulated for comments, not only from the schools but also from vendors of hardware used in current installations, contractors/installers and companies actually offering FTTx to their customers. Needless to say, we got lots of feedback, including the expected diversity of opinion, which was addressed in the final program.

The "guinea pigs" for our program were students taught by Dave Miller of New Hampshire Community Technical College at Pease in Portsmouth, NH in July, 2006. Miller and his students liked the program. He said, "Overall, the students were very happy with the quality and focus of the materials. They asked me to express their thanks to you for making this opportunity available to them. This program will make a great addition to our fiber optics program at NHCTC!" Feedback from the NHCTC program was incorporated in the general release of the FOA CFxT program to all our schools last month, in September, 2006.

Remember, the FOA does not have a fixed curriculum that we provide to our approved schools.

Phong Phan of Corning shows Patrick Baker and Ron Bible of the Sage Group, a training organization, how to set up a splicing lab for students.

Creating a Workforce for FTTx

The FOA has the world's largest network of fiber optic trainers. Of course, many of our schools specialize in other areas, so FTTx is not on their agenda exclusively. Others specialize in telco training, so the FOA worked closely with them in developing the program. But interest from the others has also been strong, and from some seemingly unlikely places.

For example, the IBEW (International Brotherhood of Electrical Workers) training organizations have expressed great interest in the programs because IBEW contractors are doing FTTx projects already. Some military trainers have also shown interest, as trained military personnel

We have our reference text, *The Fiber Optic Technicians Manual,* and we set standards for the training. But our approved schools develop their own programs, which allow them flexibility to teach courses appropriate for different applications, whether it is OSP, premises, security, military, industrial, utility or whatever is needed.

In the case of FTTx, we decided the priority associated with getting programs available quickly made it reasonable for us to create the basis of a program that the schools could modify as needed to fit the FTTx philosophy of their customers. Feedback from our schools indicate they are incorporating materials from their customers for training that customize the training for the particular applications of FTTx in use by company or regionally.

One thing we know for certain is that the FOA CFxT program will have to evolve as the industry tries and accepts or rejects various FTTx solutions in the search for a final standard. Hopefully FTTx will be more standardized by the time the

Tom Collins (at left) and John Highhouse (right) of the FOA show instructors how to use a fusion splicer at a FOA Train-The-Trainer course.

4th edition of *The Fiber Optic Technicians Manual* comes out in about 2009.

leaving the service realize the job opportunities created by FTTx.

That's very good news for the industry, as many technicians trained

FOA President Jim Hayes teaches instructors some fiber optic theory.

proved schools can produce.

We at the FOA feel proud of our efforts to support FTTx and do our part to help the FTTx industry grow as fast as it can. Our contributions through this program and our other technical services to the industry fulfill our goals of promoting fiber optic applications worldwide. **BBP**

About the Author

Jim Hayes is a co-founder and current President of The Fiber Optic Association. He was introduced to fiber optics in the late 1970s by Bell Labs, and founded one of the first fiber optic companies, Fotec, in 1981, which was sold to Fluke in 2001. He began training fiber optic techs in 1982, and has trained thousands of techs and instructors through the FOA, Fiber U and VDV Academy programs.

in FTTx are going to be needed. If a crew can connect two FTTx homes a day, it can only do about 500 homes per year. One million homes per year will thus require at least 2,000 techs, assuming 100 percent efficiency, which, of course, is impossible, as the homes will be spread all over the country. The industry will easily absorb all the technicians the FOA ap-