

Cable Vendor Certification

BY ART KOZEL AND RUBEN ARMAS



INTRODUCTION

All Good Manufacturing, Laboratory, and Clinical Practice (GXP) regulated organizations have a certification or qualification process to ensure that all vendors are reputable and qualified to perform the work they have been hired to do. This paper outlines the minimum set of requirements that must be met by cabling vendors to ensure that cabling infrastructure has been installed properly and will perform as expected.

Cabling vendors are an integral component to the success and proper performance of a company's networking infrastructure. They are responsible for the installation of the cabling that interconnects and supports all Information Technology (IT) systems. These IT systems are used to support many of the activities of a GXP organization such as data acquisition, document control, change control, Corrective and Preventive Actions (CAPA), and regulatory submissions, just to name a few. It is for this reason that organizations require a certification process for all cabling vendors providing services to the organization.

Training Processes

Cable vendors should be required to have a training program for their cable installers providing them with the technical knowledge to properly install a copper or fiber link within a building. The training program must, at a minimum, make provisions for a BICSI certification and a cable vendor certification. In addition, installers must be trained on any testing equipment that is to be used as part of the installation of the cable. A crew of installers must have at least one fully trained installer on site during installation. The following sections further describe the different types of training.

BICSI Certification

Building Industry Consulting Service International, Inc. (BICSI) is an organization that was founded in 1974 to serve as telephone company building consultants. Today, BICSI is one of the largest training organizations responsible for training installers, designers, and engineers on all

facets of telecommunications cabling, including the Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) specifications for cable performance and current building codes. Reputable vendors have their installers certified as BICSI installers. A crew of installers working on a project should have at least 50% of the crew certified by BICSI and the other half scheduled for training or undergoing BICSI training at the time of the cable installation.

Adherence to building codes is an important aspect of cable installation. When a cable is being installed, it is important that the installer know what materials can be used in the ceiling and in the walls. Poly Vinyl Chloride (PVC) cabling, for example, is commonly used for patch cords, but cannot be installed inside a wall, because PVC cabling lets off a toxic gas when burned. In a GXP environment, it is important that the cable is certified and that the person performing the test understands the cable testing parameters to address any issues or failures during the cable testing.

Manufacturer Certification

Cable vendors are responsible for ensuring that their installers have been properly trained on the cable system being installed. In many cases, cable vendors offer a suite of components that can be used when installing the cable. These components include the wall jack, the cable, and the patch panel, and together they are referred to as a cabling system. Manufacturers will guarantee cable performance only if the suite of components is used and the cable has been certified according to their specifications. To ensure the cable has been installed according to manufacturer specifications, the cable manufacturer will train and certify the installers on their cabling system.

Test Equipment Training

Cable manufacturers will honor their twenty to twenty-five year warranty if the cable has been installed using all of their approved components and the cable has been tested and certified. Additionally, in a GXP environment, the cable certification is an important piece of documentation because

it provides objective evidence that the cable performs as designed and meets both the manufacturers and TIA/EIA specifications.

The installer performing the cable certification must be trained on the test equipment being used to ensure that the installer has the skill sets required to test the cable and further validate the worthiness of the cable. All cable tester vendors provide training and certification on the cable testing equipment they sell.

Equipment Calibration

In all GXP environments, it is a requirement that all data generating test equipment supporting GXP applications be calibrated and maintained. In the cable certification process, a cable testing analyzer is attached to the cable to test the properties of the cable. The testing results are then used to support the claim that the cable has been installed properly. If the cable is used to support GXP applications, the cable testing analyzer must be calibrated. Most manufacturers suggest that all cable testing analyzers be maintained and calibrated annually. Therefore, it is the cable vendor's responsibility to ensure that the cable testing analyzer is calibrated according to the manufacturer's suggested schedule. The cable results cannot be used if the cable testing analyzer was out of calibration at the time of testing.

Vendor References

Vendor qualification is a broad subject. It can be argued that the entire process of certifying a vendor is actually verifying a cable vendor's qualifications. But in this case, the cable vendor's qualifications refer to the vendor's relevant past experience. When certifying a cable vendor for the first time, it is always prudent to perform a reference check. The cable vendor should be able to provide adequate references of projects comparable to the one being performed. His references should include company names, IT management contacts at the company, current phone numbers, and current email addresses.

State Licensing

The state licensing process is designed to protect the consumer by ensuring that cable vendors are aware of the current state building codes. Cable vendors are regulated by the state and, therefore, require that a cable vendor be licensed in the state where the work is being performed. Without a valid state license, a cable vendor will not be able to pull building permits nor will a building inspector ap-

prove the work. If the cable vendor does not pull a permit, a building inspector may require the removal of cabling for jobs that must have prior approval before commencing. Such actions may result in significant delays as well as incurring additional expenses.

Insurance

All cable vendors must have liability insurance. Cabling vendors must provide documented proof of a current insurance policy. Hiring a cabling vendor that does not have liability insurance is risky and may be a sign that the cable vendor is not completely reputable. Additionally, without liability insurance, a state or county government may not allow the cable vendor to conduct business in their jurisdiction and may prevent them from pulling job permits.

CONCLUSION

Certifying a cabling vendor is an important step in maintaining the networking infrastructure in a qualified state. The certification and qualification process may vary from company to company, but the elements are the same regardless of the application. This paper outlines the minimum requirements of a cabling vendor that should be incorporated into the acceptance criteria for a company's certification process. The items discussed here, verify that the cabling vendor provides adequate training to their installers and maintains their testing equipment in good working order. Additionally, there are certain requirements of the state and county that an organization must comply with by hiring a state licensed cabling vendor. □

SUGGESTED READING

1. "Commercial Building Telecommunications Cabling Standard TIA/EIA-568-B," TIA/EIA Standard, (May) 2001.
2. FDA. General Principles of Software Validation; Final Guidance for Industry and FDA Staff
3. FDA. *Guidance for Industry Part 11, Electronic Records; Electronic Signatures - Scope and Application*
4. Fields, T., "Establishing a Sound IT Infrastructure in a GXP Environment," *Journal of Validation Technology*, Vol 9, No. 3, 2003, pp. 229-234.
5. Haudahl, J. S., *Network Analysis and Trouble Shooting*. Addison-Wesley: Upper Saddle River, 2000, pp 357.
6. Hay, D. C., *Requirements Analysis: From Business Views to Architecture*. Prentice Hall PTR: Upper Saddle River, NJ, 2003, pp xxxvi, 458.
7. McCabe, J. D., *Network, Analysis, Architecture, and Design*, Elsevier Science (USA): San Francisco, 2003, pp 501.

8. Neal, C., "Prerequisites for Successful Validation" *Journal of Validation Technology*, Vol 9, No. 3, (May) 2003, pp. 240-245.
9. Tracy, D. S. and Nash, R. A. "A Validation Approach for Laboratory Information Management Systems." *Journal of Validation Technology*, Vol 9, No. 1, (November) 2002, pp. 6-14.

ABOUT THE AUTHORS

Art Kozel is a senior consultant for Qualified Data Systems. He has diversified Operations and Information Technology experience within the clinical diagnostic industry. He is a former manager and systems engineer with a solid track record in software engineering, IVD manufacturing, systems engineering and integration, network security, system design and implementation, requirements analysis, and software/process validation.

Mr. Kozel has over 14 years of industry experience. Before becoming a consultant, Mr. Kozel worked as a systems engineer for Medical Analysis Systems, and previously for Dade Behring and Baxter Healthcare. He has managed software development projects from requirements engineering stage through implementation, testing, and deployment. Mr. Kozel has managed the production of custom manufactured OEM products, technical transfers from R&D to manufacturing, process improvements, and process validation for diagnostic product line.

Mr. Kozel has a Masters of Science in Computer Information Systems from Nova SouthEastern University, a Bachelor of Science in Chemistry from University of Miami and is currently pursuing a Doctorate in Computer Information Systems from Nova SouthEastern University. Art can be reached by email at: akozel@qualifiedsystems.com

Ruben Armas is a certified Microsoft System Engineer and technology consultant with Qualified Data Systems, a global Information Technology Corporation

specializing in Information Management, Compliance Solutions, Verification & Validation, and Systems Engineering for the Life Science Industry.

Mr. Armas is experienced in working within a regulated environment implementing custom solutions for technology infrastructures and execution of network qualification activities. Mr. Armas has a strong background in computer hardware, software support, and systems design. He has extensive experience with disaster recovery, backup and restore services, and administration of Windows NT, 2000, 2003 and Linux operating system platforms.

Mr. Armas is also a subject matter professional in the area of security related to customer data assets. He has performed risk assessments and protected systems against vulnerabilities from fraudulent activities, including penetration studies, security audits and documentation of topologies and procedures.

Mr. Armas possesses a Bachelors of Science degree in Information Technology and is currently pursuing his Masters of Business Administration from American Intercontinental University. He can be reached by email at: RARMAS@qualifiedsystems.com

Article Acronym Listing

ACR	Attenuation to Crosstalk (ratio)
BICSI	Building Industry Consulting Service International
CAPA	Corrective and Preventive Action
EIA	Electronic Industries Alliance
GXP	Good Manufacturing, Laboratory, and Clinical Practices
IT	Information Technology
PVC	Poly Vinyl Chloride
TIA	Telecommunications Industry Association

© Reprinted from JOURNAL OF VALIDATION TECHNOLOGY, August 2005 AN ADVANSTAR PUBLICATION Printed in U.S.A.

Copyright Notice Copyright by Advanstar Communications Inc. Advanstar Communications Inc. retains all rights to this article. This article may only be viewed or printed (1) for personal use. User may not actively save any text or graphics/photos to local hard drives or duplicate this article in whole or in part, in any medium. Advanstar Communications Inc. home page is located at <http://www.advanstar.com>.

Qualified Data Systems

www.qualifiedsystems.com

305-444-1212