Training and Qualification Standards for Lineworkers

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The lack of standards in the Electric Utility Industry for Lineman training and qualification plagues us when hiring, managing safety or deciding which work assignments to give to which employee. Additionally, after a storm, as outside help comes in, can these new workers restore our system, without getting hurt? How do we know what they are qualified to do? It is singularly odd, in such a potentially hazardous occupation, that what qualifies one to be a Lineman should be so ambiguous.

How did it get this way?

The U.S. Department of Labor says there were approximately 112,000 Electrical Powerline Installers and Repairers (SOC Code 499051) working in the trade, in 2006. Small numbers when compared to the millions of workers out there in the various trades. The number of Linemen working for Utilities and Contractors has always been relatively small. When employment levels are so relatively low, formalities get overlooked. Linemen have always tended to 'fly under the radar' concerning safety, training, competency requirements and even OSHA regulation enforcement. It's a small group – who cares if 35 occupational fatalities occurred in 2008? That's not many compared to other trades. So, the old worn out process of 'apprenticing' to an experienced journeyman has prevailed – nothing formal – just tag along and pay attention. No standards of competency or performance. Maybe the new guy gets lucky and he learns enough to stay alive and build on his experience – just minus a couple of fingers or some minor flash burns to teach him a lesson. Maybe the next guy isn't that lucky and looses an

arm, a leg or his life. And so it has gone for the past 125 years, since that first line was energized in the public domain.

That was then, this is now

Attitudes are changing and a new generation of young people entering the trade now seeks formal training and some form of recognition that they are competent to do the job. Overall, according to the Center for Energy Workforce Development, by 2013 the Industry may need to replace between 40% and 50% of its aging workforce. At the same time, growth is expected to add 13,500 Lineworkers to the current level, by 2016. Taken together, more than 50,000 new Lineworkers will apprentice over the next 6 years.

Over the past ten or fifteen years many have tried to implement training and safety programs to comply with the new expectations for Lineworkers. Hit and miss can best describe most of these efforts – though something has been better than nothing. The challenge has been to design programs that adequately train to the competencies required to be a high-voltage Lineworker, today. And everyone thinks they know what those competencies are. Just ask them. But in this case, when everyone thinks they know, no one really knows. When we have thousands of opinions about what those true qualifications should be, we end up with thousands of partially qualified Linemen. No Standard has yet been established against which we can measure. To train someone to be a Journeyman Lineman you need to widely agree upon what a Journeyman Lineman must be qualified to do.

Achieving Industry 'Consensus Standards'

The Electric Utility Industry, along with Powerline Contractors, needs Lineworker training and qualification Consensus Standards. Consensus means what it says: the majority of

us needs to agree upon and put into practice what a Lineman must know and be able to do, to be called a Lineman. Here are some important aspects of a Consensus Standard:

1. It must define 'Levels of Performance'
2. It must serve the 'Public Good'
3. It must be 'Voluntary'
4. It must be created by 'Consensus'
5. It must be 'Impartial'
6. It must define 'Baselines of Performance'
7. It must be widely accepted and widely used

The Electric Utility Industry is fragmented. Many separate organizations exist today that employ Lineworkers, but these can actually be grouped into four main categories:

- Investor Owned Utilities (IOU's) employ 80,000 Lineworkers
- Rural Electric Co-operatives (Co-ops) employ 18,000 Lineworkers
- Municipal Electric Utilities (Muni's) employ 15,000 Lineworkers
- Contractors employ 22,000 Lineworkers

This is just in the United States, alone. Bringing these groups together to define and agree upon training and qualification standards for Lineworkers will not be easy – just necessary. Many organizations with interest in the Industry recognize the need for Standards and are beginning to voice support such an effort.

It has been suggested that an initial endorsement to a Consensus Standard should come from the U.S. Department of Labor, Bureau of Apprenticeship and Training (DOL BAT), since they already have a Certification process in place and represent the 'Public Good' as mentioned above.

The difference between 'Standards' and 'Certification'

Don't confuse 'Standards' with 'Certification' or vice-versa. The difference is important and can be explained with the following definitions:

- **Standards:** Determine 'performance requirements'
- **Certification:** Indicates 'Conformity to a standard'

Standards come first. With the proper model, this can help DOL BAT use the Consensus Standards as a minimum requirement to award their Certifications. When they do, other programs will follow suit.

Where to Start?

The best Lineworkers have a solid foundation of three components: **knowledge, skills** and **experience**. They must be **knowledgeable** of both the theory behind the electric systems on which they work and the practical understanding of what works and why. They must be proficient at the **skills** required to build and maintain the electric system using the 'best practices' acknowledged by their fellow tradesmen. They must have an opportunity to **experience** the work and practice their trade. With practice, the Lineworker becomes professional – a Journeyman and ultimately a Master Mechanic.

So, what should a Lineman know and be able to do – and when, within this process of becoming a professional? In 2006, the Institute for Safety in Powerline Construction (ISPC), a non-profit Industry Association, canvassed Electric Utility safety and training professionals through an Industry-wide, on-line and direct mail survey. From the results, ISPC compiled a list of 171 Basic Lineman Competencies within 8 major categories that sets a minimum 'Benchmark' Standard for Lineworkers wishing to practice their trade at a Journeyman level on

energized distribution systems (see inset). Additionally, to be considered a 'Master Mechanic,' 2 more categories need to be integrated into the Standard comprising 20 additional competencies:

1. **Transmission Systems** 9 Competencies
2. **Substations and Switchyards** 11 Competencies

This proposed initial Standard, then, suggests a baseline Benchmark. There are 10 major categories comprising 191 competencies to be a qualified as a professional Lineworker.

Are 10 categories and 191 competencies the magic number; the right formula? Possibly not. But it is a reasonable place to start. Individual organizations may choose to build on this Standard just as they may choose now to exceed the minimum safety standards required in the US DOL OSHA 1910.269 regulations. Going beyond the minimum Standard may be important in a given situation or within a given organization. But by having a reasonable baseline, it is easier to make that determination.

Apprenticeship Models

The question of 'when' a Lineworker should know and be able to reasonably perform each of these competencies within the Standard, highlights the need for an Apprenticeship 'Model.' Generally speaking, the Industry has accepted an 8,000 hour, four year duration for Lineman Apprenticeships. Apprenticeships in the U.S. currently range from 36 months to 72 months, though a majority of current programs subscribe to the 48 month model. Once again, US DOL BAT patterns their Certifications for achieving Journeyman Lineman status on this four year period of training, as well.

ISPC has arranged these first 8 Categories and 171 Competencies into a progressive model (see illustration) that defines a Lineman Apprenticeship over a 48 month time frame to complete the curriculum and gain the knowledge and skill sets to be called Journeyman. An additional 12 months' training on the remaining 2 Categories and 20 Competencies are required to achieve 'Master Mechanic.' Again, as mentioned above, practicing the trade and gaining the experience required for true proficiency takes time.

Conclusion

Being a Lineman is a highly skilled, honorable trade that will continue to be important to the Electric Utility Industry for generations to come. Commonly accepted safety and training practices are essential to the health of the Trade and every worker employed within it. It's time that training and qualification Consensus Standards be implemented for Lineworkers everywhere.

INSET: Basic Lineman Competencies

1. **Electrical Theory**	12 Competencies
2. **T&D Systems Overview**	20 Competencies
3. **Safety Practices**	36 Competencies
4. **Rigging Skills**	19 Competencies
5. **Tools and Equipment**	29 Competencies
6. **System Protection and Metering**	15 Competencies
7. **Overhead Distribution Systems**	28 Competencies
8. **Underground Distribution Systems**	12 Competencies

Lineman Apprentice Training

Southeast Lineman Training Center, Chattanooga, TN

Thomas Ondrey/The Plain Dealer.

Manuel McKinney trains to be a lineman as a member of Cleveland Public Power's first apprentice class

Electric Power Technology Program, led by instructors at Bismarck State College in Bismarck, ND