

WELCOME TO THE Q1 2018 EDITION OF THE NEXSTATION LAB REPORT

Key Conclusions:

- > A lab is useful for determining needed equipment, establishing configuration parameters, testing compatibility with existing systems and confirming data requirements.
- > The primary reason for developing your own lab is to test, test and test some more.
- > Testing enables you to dig into the details: inputs, outputs, and performance.
- > Developing a successful lab requires a vision that considers the full range of needs: from experimentation through deployment and operation, while allowing scalability as new technologies emerge.
- > It's no longer optional to work in the dynamic utility business without having access to a lab. With the rapid advancement of technology, you need to be testing equipment and scenarios in a world-class lab facility.

Last year, POWER Engineers unveiled our newly expanded NexStation Lab in Boise, Idaho. For more details about the expansion, check out the press release and a virtual tour of the lab [here](#). Since reopening the lab in April 2017, we have been busy with additional upgrades as well as several large projects in the lab.

In the past year, we have been thinking a lot about the effort that goes into launching a lab and achieving meaningful engineering results. With that in mind, we thought we'd share some of our thoughts on the subject of starting a lab for the modern utility. Starting in Quarter 2 2018, we intend to resume with quarterly updates to share insights about our technical activities in the lab. This quarter we outline some thoughts about launching a lab, which we hope will be of interest to the many utilities who have built, or are considering building, their own lab facilities.

Do you need a technology lab?

Technology is certainly keeping things interesting in the utility business.

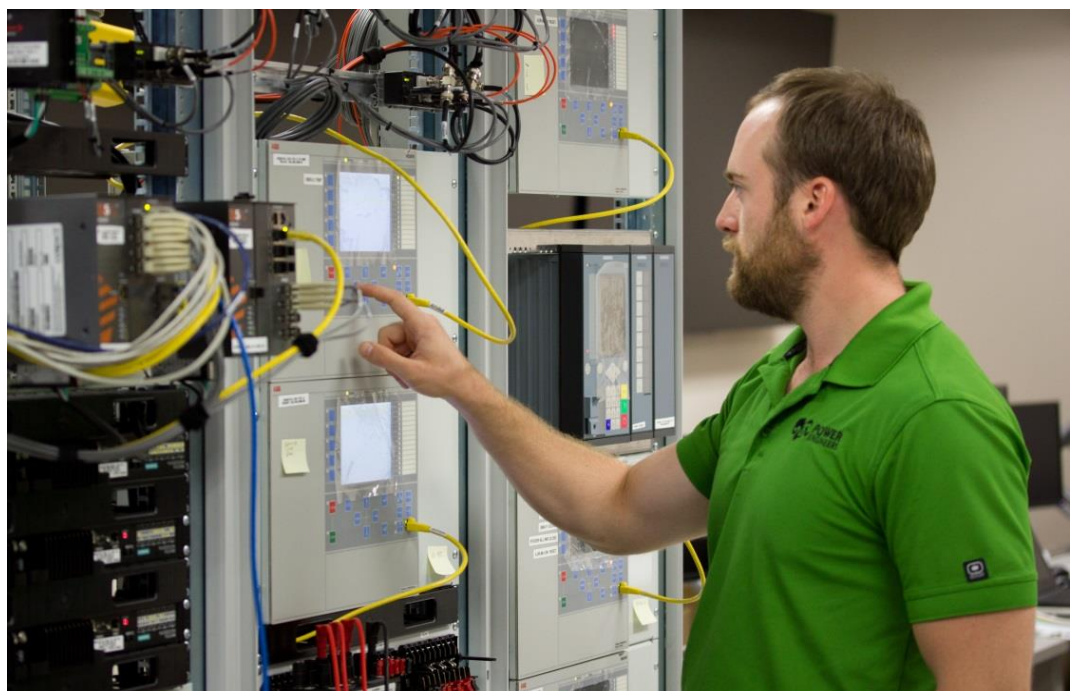
Consider all of the advancements in each of the following areas over the past decade: communications, data, relays, reporting, monitoring, asset management and more.

The data you rely on comes from your systems. Questions come rapidly, and answers are expected instantly. Are your systems performing as you expect and providing you the information you need? How do you know?

That's where a technology lab may fit in. A lab is useful for determining needed equipment, establishing configuration parameters, testing compatibility with existing systems and confirming data requirements.

What are the benefits?

The primary reason for developing your own lab is to test, test and test some more. Vendors provide a lot of great equipment, but will it really do everything you want and need it to do in your application environment?



SOLICITING YOUR INPUT:

We value your feedback and welcome input. Send your testing ideas to:

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To receive a PDF copy of this newsletter quarterly, please send an email to scott.olson@powereng.com or call 406-237-2000 and ask for Scott Olson.

Testing enables you to dig into the details: inputs, outputs, and performance. You can test different configurations and settings. You can even try different types of equipment in similar roles to determine best fit. The lab empowers you to explore. Most importantly, testing allows you to work out bugs and deployment issues before they get to the field. You save time and money, and you potentially prevent outages.

Beyond testing, there are other functions for a lab. It can serve as an incubator for new applications of technology in a risk-free environment. Interconnections with microgrids and distributed energy resources can be explored and tested without system impacts. New human-machine interfaces can be deployed and tested for functionality and efficiency. The lab also can serve as an educational tool for engineers, operators and technicians, exposing them to new operating and maintenance procedures.

Developing a successful lab requires a vision that considers the full range of needs: from experimentation through deployment and operation, while allowing scalability as new technologies emerge.

Building a lab is not for everyone

There are many things that a successful lab should be able to do, and sometimes it's difficult to know just what is out there and how to go about setting it all up. Couple that with the fact that technology continues to evolve and new devices are coming out very quickly, and developing a lab becomes complicated. Vendors may be able to provide insights into their equipment, but their intent is to sell their equipment.

Purchasing equipment to build the lab and test multiple technologies becomes an expensive proposition. Even if you can obtain donated equipment, there are the costs of building and staffing the lab. As technology advances, more money is required to keep the equipment relevant. Lab personnel must be engaged in continuous learning through classes and technical committees in order to remain experts. It's a daunting task to develop a successful lab while technology is constantly evolving.

Maybe your utility is large enough to fund, staff and maintain a successful lab. But if it isn't, there are university or industry partners who can provide this service for you. The benefit of finding a partner is gaining access to a broad platform that allows for multiple configurations and equipment types. You also gain access to experts who are trained and up-to-date with the latest technologies. As you test, advise and train employees on the equipment you choose, finding a vendor-neutral partner is a critical part of this.

Not having access to a lab is not an option

Do you invest in your future by building, staffing, and maintaining a lab? Or do you find efficiencies by working with an outside partner as you test, deploy and operate new technologies?

Each of these alternatives has advantages and disadvantages, but we argue that it's no longer optional to work in the dynamic utility business without having access to a lab. With the rapid advancement of technology, you need to be testing equipment and scenarios in a world-class lab facility. You owe it to your customers and to your business.