

The Strategic Communications Plan: Your Smartest Path to the Smart Grid

By Rick Schmidt and Charles Plummer



Not too long ago, utilities could procure and deploy one communication technology for each new application installed on their system. Because the technologies were less sophisticated and used primarily for single applications, the ramifications of a poor communications deployment choice, while disruptive to operations, would not spread beyond the realm of the one application. In turn, because different departments would purchase systems and applications for their own needs, communications systems often proved to lack scalability beyond the initial application.



Now that utilities are connecting several applications over a common communications network, a poor deployment choice impacts several applications. Without a cross-departmental coordinated procurement process, utilities are vulnerable to overlooking key current requirements or requirements for applications that could be added at a future date.

What can you do to ensure that the communications technologies deployed today will remain viable for all departments for years to come? The answer is to define the utility vision for the future and a strategy for achieving this vision by completing a Strategic Communications Plan.

What Is a Strategic Communications Plan?

At the highest level, a Strategic Communications Plan is a clear picture of a utility's vision for the future. This vision incorporates input from many disciplines, including operations, engineering, customer service, rates, HR, corporate training, IT, power supply, administration, and many others.

The Strategic Communications Plan focuses on integrating and leveraging the utility's communications infrastructure for present and future applications. This planning stage is crucial to implementing smart grid applications such as system monitoring and control, home automation pro-

grams, and enterprise office-to-office networking. A strategic communications plan is, in fact, the very foundation of a smart grid.

Why Do I Need a Strategic Communications Plan?

With the growth of TCP/IP Ethernet and the proliferation of lower-cost, robust, reliable, and secure private and commercial communications media comes the opportunity for building communication networks that are shared for many applications versus the piece-meal communications approach used in the past. Essentially, the more complex (and capable) environment of today's smart grid requires a more complex and forward-thinking communications strategy.

The smart grid is not a purchased product, but a concept of deployment for a range of technology systems such as AMI, OMS, SCADA, new electric distribution programs, and "smarter databases." It also combines core backbone to office locations and bandwidth for video for enterprise and mobile training. However, not one technology or strategy fits all utilities. A Strategic Communications Plan leverages existing assets, so each plan is specific to the utility that creates it. This approach dictates that each utility will achieve the "smart grid" function of automatically collecting data from multiple applications differently based on its current assets and future needs.

Ultimately, the common denominator for successful deployment of utility automation applica-

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What are the Benefits of a Strategic Communications Plan?

- Increases stakeholder participation
- Justifies the procurement of more dynamic communications infrastructure
- Spreads communications capital expenditure across multiple applications
- Reduces overall recurring communications costs

The Strategic Communications Plan

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tions is a well-developed communications plan and infrastructure. Best practices for communications at utilities start with an overall communications strategic plan developed with a goal for interoperability of applications using the same communications infrastructure.

But first, for a true Strategic Communications Plan to be developed, a cultural shift away from past communications planning methods is usually needed.

Implementing a Culture Change

The culture change starts with a strategic desire, shared by all functional stakeholders, to shift from the past. In the past, utility system plans developed a unique communications infrastructure for each application that was implemented because each application typically benefited one of the utility's functional groups more than others. Given the proprietary protocols of the past, that approach was understandable. However, that approach creates "silos" in the organization, meaning that each functional group has its own isolated information-retrieval process and data-storage area.

Shifting the utility culture from a functional or silo organization to a shared infrastructure is the first step in implementing a smart grid. This cultural step is probably the most challenging to achieve, but it is the key to leveraging both the infrastructure and the operational data. This step will need to be driven by the board of directors and the executive staff at the utility.

Trends to Consider

Listed below are several of the factors we have found that influence the development of a utility-wide Strategic Communications Plan:

1. There is an aggressive movement to retire proprietary SCADA protocols and replace them with standards-based DNP3 or IEC 61850.
2. Migration from lower-speed serial to Ethernet and TCP/IP communications backbones. This typically requires more base stations and/or a high-speed backbone. This backbone is sometimes built with future applications, like a new mobile voice radio system, riding on it.
3. Aggressive migration to two-way AMI. In the last few years, there was a breakthrough with new wireless AMI technologies. This breakthrough also requires a backbone to transport the data from locations in the distribution network to

centralized backbone nodes.

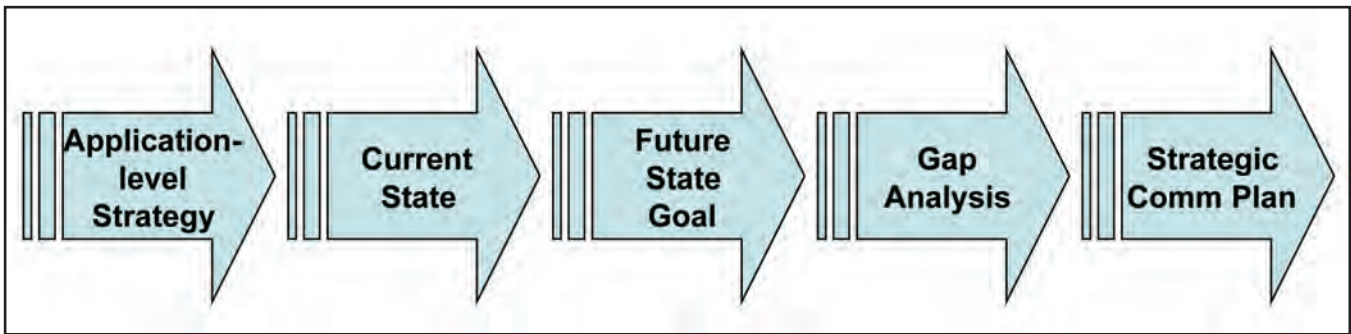
4. A movement to replace the aging VHF load management systems with new two-way AMI technology.
5. A migration toward two-way demand response in the homes with new smart thermostats and critical peak-pricing programs. Many utilities face complicated and expensive challenges in this area.
6. A need to upgrade the transmission-level substation relay protection application where a less than 4 ms latency requirement exists.
7. A plan to improve reliability with a "low-hanging fruit" DA strategy, in which automatic sectionalizing strategies are created for the worst-performing feeders. A fixed data communications infrastructure is needed for this strategy.
8. A migration to implementing a mobile data infrastructure. Most utilities have concluded that 14.4 Kbps will meet many of the applications where coverage is critical but may fall short of meeting future high-speed mobile data applications.
9. A proliferation of new distributed generation applications that need control and monitoring.

All of these points can be referred to as pieces of the smart grid. The common denominator is the need for sharing of towers and the backbone network. The backbones are usually a combination of fiber, licensed and unlicensed microwave, and possibly some use of commercial telephone circuits.

How Do I Develop a Plan?

Before developing the Strategic Communications Plan, it is often best to have an overall application-level strategy in place, defined by a cross-departmental team of stakeholders, which identifies the dates of automation application deployments such as AMI, new types of mobile data applications, new types of or additional distribution automation, and possible upgrades needed for operational district offices. Next, the team should document the current state of the utility and the future state goal and then create a gap analysis that outlines the missing components between the current state and the future state goal.

The gap analysis will help define areas that need change to achieve the future state objectives. In most cases, the future state cannot be achieved without adding new enterprise and/or operational technology applications. For instance, to further enhance the utility's customer relations and cus-



customer service, AMI may be identified in the strategic plan as a technology needed to fill the gap. Typically utilities identify AMI, mobile workforce management, SCADA, distribution automation, IP communications to substations and district offices, and upgrades to their mobile voice system as the most common necessary technology improvements to support their overall utility strategic plan.

Once the technology applications that address the gap analysis are identified and cost-justified as necessary by creating business cases, the Strategic Communications Plan can be developed. The plan will focus on how the different technology applications will interoperate and communicate back to the data-storage location. If developed properly, the plan will outline a five-year roadmap of communications deployments required to support the overall vision and strategy of the utility.

Communications Technologies to Consider

The technologies you consider will depend on many variables specific to your utility's existing system. Some key communications technologies often include:

- Fiber
- Microwave licensed and unlicensed point-to-point links
- Telephone company leased circuits (more recently used as gap fillers where other technologies fall short)
- 900MHz unlicensed point-to-multipoint
- 900MHz, 2.4/5.8GHz mesh products
- 3.65GHz WiMAX
- Emerging software-defined radio (SDR) with licensed frequency
- Cellular
- Satellite
- Mobile voice for low-speed mobile data applications

Much of the time spent creating a Strategic Com-

munications Plan is comprised of evaluating the various communication architectures and then communication technology alternatives. Receiving corporate cross-departmental buy-in after each milestone is also very important. In the end, a roadmap can be created with executive buy-in.

Conclusion

As utilities face the degradation of older systems, new infrastructure can revolutionize how you gather and use data and information. Planning can help your utility reduce customer costs, solve business challenges, and realize value and potential in infrastructure. While the learning curve can be steep, the benefits can be invaluable. Developing a utility-wide Strategic Communications Plan to support the strategic initiatives of the utility is imperative to its success. +

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