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Power & Energy

www.nextgenpe.com • Vol 2 Issue 2

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Technology goes mobile

What are the key issues that energy companies should be aware of when seeking to deploy mobile workforce solutions? And what are the benefits they bring to the industry? *Power & Energy* gathered **Dr. Moshe BenBassat** of ClickSoftware, **Leif Eriksen** of Motorola, **Guerry Waters** of Oracle Utilities, **Aaron Hersey** of RAM Mounting Systems and **Thel Gillis** of Panasonic to discuss the next major developments in the mobile space.

PE. How are energy companies utilizing the new generation of mobile workforce solutions? What particular benefits can they bring to the industry?

TG. Operational efficiency is always the first and foremost consideration. The benefits of a mobile workforce solution are as follows: the utility can schedule, route and dispatch a large field workforce for service restoration, routine maintenance, trouble calls, connects and/or disconnects, locate company assets with AVL and/or GPS technology, along with re-directing work crews based on skill sets and licensure issues. This allows these field technicians to operate in any type of harsh weather environment 24/7 and maintain connectivity to the enterprise with wireless capability, ensuring their laptop or mobile form factor does not have a failure.

AH. Energy companies have practically everything to gain and nothing to lose by integrating mobile technologies into their workforce. For example, wireless networking via a Tablet PC in the field allows the freedom to communicate in real time with both the base of operations and others on site. The easy transfer of data keeps everyone on the same page and creates more opportunities for success. The ability to change a work order on the fly and get that information to someone in route can save time and money. Mobile workforce solutions bring cost savings and efficiency to the workforce.

GW. At utilities, new mobile workforce solutions significantly improve customer satisfaction. These solutions permit customers to schedule appointments at their convenience with one short visit to a website or with a single call to the contact center. They permit utilities to follow up both the day before and the day of the appointment to make sure the customer still needs the service and will be available to accept it. They route field crews through traffic to increase the number of on-time appointments. They ensure that the right person with right equipment arrives onsite ready to handle customer issues. They let crews handle reporting from onsite, thus increasing bill accuracy. And they significantly reduce the cost of service by enabling crews to complete a mix of scheduled and emergency service appointments within the normal workday.

MB. In scope of operations, workforce management has moved from simple, short-term tasks and can now address simple tasks as well as long-term projects, crews, bulk installations and preventive maintenance. The scope of management has expanded from maintaining and communicating a shared work plan to forecasting and planning, so that the budgets, subcontracting, hiring and training are just right for next week, quarter or year.

On the agility side, workforce management has moved from recording and communicating data for humans to use in their scheduling and planning decisions, to largely automated decision-making, where the plans are immediately and optimally changed to fit the new information.

Later, it picks up the task and uses it as part of an intra-day rescheduling for crew who have responded to an emergency far from the area of their original appointments. Smart grids also better identify the nature of transmission and distribution problems. Passing that information to the mobile workforce application permits utilities to send out the right crews with the right equipment immediately. There's less need for a preliminary inspection.

Smart grids may also be able to 'self-heal', restoring service temporarily, prior to crew arrival. That gives the mobile workforce application more leeway to schedule a crew's arrival after, for instance, it completes its current task or via a more fuel-efficient but slower route.

LE. The mobile workforce is an integral part of deploying the smart grid. Replacement of existing infrastructure with smart grid components – such as smart meters – requires a mobile workforce with the right tools to get the job done effectively. Once deployed, the smart grid will provide greater access to and more accurate information for the mobile workforce.

“Mobile workforce and smart grid applications are two sides of the same coin”

Guerry Waters



Guerry Waters, Vice President, Industry Strategy, joined the Oracle Utilities Global Business Unit (previously SPL WorldGroup) in 2000. Previous positions include VP of Energy Information Strategy at META Group (now Gartner) and CTO and Director of Technology Strategy and Engineering at Southern Company. He focuses on IT strategies that help utilities meet their goals amidst changing customer demands, regulations and market structures.



Aaron Hersey is the Director of Marketing of RAM Mounting Systems. He has spent several years in various marketing and sales roles developing successful initiatives. He has his degree from the University of Washington in Economics and Business Administration. Hersey plays an active role in assessing the customers' needs and assisting in the development of innovative mounting solutions for mobile environments.

“Once deployed, the smart grid will provide greater access to and more accurate information for the mobile workforce”

Leif Eriksen

AH. It all comes down to a single word, efficiency. Choosing the right equipment should be a big part of the overall plan to create an efficient system. The wide range of mounting products offered by RAM ensures high quality, ergonomic, durable and cost effective solutions for the mobile workforce.

For the second question, it would almost seem the other way around. Can the possibilities presented by the 'mobile workforce' mesh with those offered by the grid? For many years we have known what we want and what would make for the most efficient use of our time. However, technology and the grid had yet to get us there. While things are beginning to even, innovators and dreamers will always see potential that has not yet been realized.

MB. The smart grid promises to transform most aspects of the energy industry, workforce management included. The workforce will need to be much more mobile. The rising sophistication of residential equipment may require more customer-facing skills. The installation of such equipment will require intensive and carefully planned work during the rollout. The mobile workers will need the on-the-spot ability to access and analyze the complex information provided by the intelligent grid.

Overall, workforce management has become a strategic competency required for significant and diverse challenges such as aging workforces, smart-metering, reducing carbon emissions and renewable energy.

LE. Mobile field workers are starting to realize the benefits of more powerful mobile computers with greater connectivity options. The result is increased productivity and greater access for field workers to the information they need to do their job. Mobility traditionally brings to mind a sometimes-connected laptop in the cab of the truck. Today, it means an always-connected handheld mobile computer on their belt.

“The mobile workers will need the on-the-spot ability to access and analyze the complex information provided by the intelligent grid” **Dr Moshe BenBasset**

PE. What are the key issues that energy companies should be aware of when seeking to deploy mobile workforce solutions?

MB. Appointment booking and CRM, parts management, asset management and more. It is critical to ‘think big’. It is equally critical to ‘start small’ and create an incremental roadmap, which typically starts with visibility: linking the central office to the engineers’ mobile devices. With visibility comes shared data and decisions, and it invariably delivers business value by increasing efficiency. It also supplies a critical ingredient: measuring baseline performance, helping to set goals for the next steps on the roadmap, such as automation, optimization, forecasting and planning.

Share the whole roadmap with the key stakeholders, including the engineers, planners and dispatchers. Also, consult with other energy companies who may be further along the mobile workforce management journey.

LE. Workforce adoption is the number one predictor of mobile application success. If your field workforce is not engaged in the deployment, the technology could be under-utilized or, worse, unused. We all know about deployments where the mobile devices are left in the shop or in the cab of a truck when the field worker goes to do his/her job.

Other pitfalls to successful mobile application deployment include application selection and application integration. Addressing these potential issues upfront through planning and extensive vendor evaluation leads to a more successful deployment.

GW. There are two major areas of concern that utilities need to address during the planning and implementation of new mobile workforce solutions. The first is field communications infrastructure. As anyone who has ever lost a mobile connection knows, signal strength and reliability can vary widely across a normal service territory. And even the best applications are less than helpful to the field crew that can’t communicate with them. If communications links are less than perfect, utilities must equip field workers to work offline for extended periods and then upload once communications are restored.

The second area of concern is employee response. Utilities employees may well resist using software applications that appear to them to ‘de-skill’ their work or reduce their autonomy. Dispatchers may try to find fault with computer-generated schedules. Crew chiefs may try to find ways around the application’s ordering of tasks or even disable automatic vehicle locator equipment.

TG. Typically, any company should evaluate and conduct a field trial on several mobile workforce solutions, from the application itself to the connectivity if wireless coverage in a service territory is a concern,

and finally the selection of the mobile hardware. Training and education of the field workforce along with the technology adoption is paramount to the success of a field solution. There are pitfalls that can and will occur without the workforce ‘buy-in’ to the technology and applications being deployed. Acceptance or adoption with a realistic deployment schedule will avoid being inadequately prepared.

AH. Never take a ‘one size fits all’ approach when custom tailored solutions are readily available, you just have to know where to look. Companies like RAM stand out in this regard with an extensive product line providing the freedom to choose the best possible solution for each particular installation.

PE. How does a mobile workforce tie in with the evolving smart grid? Can the possibilities presented by the grid mesh with those offered by the mobile workforce?

GW. Mobile workforce and smart grid applications are two sides of the same coin. They work together to improve speed of repair and service reliability.

Let’s take an example: the smart grid identifies an undersized transformer that needs to be upgraded; it may assign a priority or timeframe to that task. The mobile workforce application then looks out over tasks for coming days and slots this one into the work of a crew that will be nearby.



Thel Gillis is Senior Market Development Manager for Panasonic Computer Solutions Company. He provides customers with top-performing, mobile computing solutions. His responsibilities have included developing and launching software application systems for the utilities and energy-related commodity trading platforms. Gillis holds a Bachelor of Science in Business Administration and has served in the US Coast Guard for six years.

“High efficiency batteries, wireless capabilities including Bluetooth and built in GPS will result in the obsolescence of docking stations and the streamlining of the mobile office”

Aaron Hersey

If the various devices and equipment, owned and operated by different bodies, are increasingly connected and inter-dependent, then work on these assets should go through the same transformation. The many players in the energy arena will need to share information and decisions at the very least, and at best they will also share workforces, so that they can all make the right decisions and plans, collaborate on execution, save on travel, improve service and meet customer expectations.

PE. In the past, there have been concerns about the reliability and security of mobile workforce management solutions. Have we now reached a point where such concerns are no longer justified and if so, what has changed?

MB. You should always consider reliability and security, but now the technology and best practices have matured so that it's no longer difficult to fully address such concerns. Mobile hardware has become rugged and reliable, while its costs have dropped. Coverage of mobile communications has expanded, and distributed data, combined with synchronization, makes it possible to function effectively even where communication access is sporadic.

Data security always requires careful evaluation, but this has become much easier with the appearance of off-the-shelf technologies for access protection (e.g. fingerprints, password provisioning), data encryption on the mobile device and communication-encryption.

TG. Software application developers now provide very robust data security and device management for any type of mobile form factor deployed in a field environment. Should a device become lost or stolen these applications have the ability to not only track where the unit is,

but also send an instant message to wipe clean the hard drive of any company data. Even the ability to send new updates to a device or ensure it maintains all the current authorized applications is possible. Mobile mounting companies provide another level of security in way of the docks that they manufacture.

LE. Mobile technology has reached a point where it can compete with fixed network technology with regards to reliability and security. Self-healing mesh topologies, redundant connectivity options and remote monitoring options all contribute to a high level of reliability. And security has benefited from the evolution of security standards such as WPA2 for mobile devices. Today, your wireless network can be considered as secure as traditional wired networks.



Leif Eriksen is Director of the Energy & Utilities Solutions team at Motorola. He is responsible for working with the company's customers, sales teams and partners to ensure that Motorola brings the right technology from products, systems and applications to management tools necessary to deliver on the promise of enterprise mobility. The team focuses on the all aspects of mobility including devices, wireless infrastructure, sensors, and the applications that drive their use.

AH. While reliability is becoming less of an issue with companies having spent huge amounts on R&D to make their products bullet proof, security will always be a concern. Highly reliable products are also expensive and highly sought after. Biometrics, passwords, ID and information vaults mean little to those that care equally about the hardware and the software.

Companies will always be justified in looking for the best way to deter thieves away from their property. To this end, RAM offers many locking products helping customers to create very effective theft deterrents. RAM's patented designs incorporate easy to use and operate hardware or locking features. Sometimes the removal of the device is the best method to avoid theft. RAM makes this easy with designs that allow the device to be removed and replaced easily.

GW. Utilities run their applications behind significant security firewalls. Wireless communications providers have made great strides in areas like data encryption

and user authentication in order to meet utilities' exacting requirements. Increasingly, governments and regulators are specifying security standards that both utilities and their vendors must meet to combat terror-related threats to the grid. Security is and will remain an ongoing challenge for all parts of the power system – as it is for all computer users.

Software reliability, on the other hand, is a task for the vendor. Responsible application vendors invest significant research and development funding to improve their technologies and to ensure that software meets the most rigorous development and testing standards. The marketplace has proved to be a very effective tool for ensuring that vendors who fail the reliability test improve or disappear.

PE. What do you see as being the next major developments in the mobile workforce space?

AH. High efficiency batteries, wireless capabilities including Bluetooth and built in GPS will result in the obsolescence of docking stations and the streamlining of the mobile office. Quality Tablet computers and laptops are expensive. Having to purchase a docking station to truly make these products effective on the go is an additional cost that can sometimes be hard to bare. At RAM, cutting edge design is what keeps every day exciting. For years, RAM has offered docking stations as well as some of the most streamlined and effective passive docks and cradles in the world. Form fitting, durable yet light-weight, RAM has been doing for the mounting industry what will soon be coming from electronics manufacturers.

GW. We anticipate that most vendors will work to improve their scheduling and routing algorithms. As less-robust applications catch up to today's more-robust offerings, utilities will undoubtedly see more functionality at lower prices. But there are a number of areas in which we see opportunities to expand functionality to, for instance, trace the progress of a job from start to completion and compare costs across jobs to identify factors that reduce job cost or time. Interfaces will become increasingly intuitive, and more information about repair histories and procedures will be available online. Both of these factors should significantly increase the efficiency of loaned crews during emergencies.

LE. Innovation and advances on both ends of the wireless spectrum will lead to more powerful mobile applications. For instance, new 4G broadband technologies will make real-time, seamless connectivity a reality for the mobile workforce. On the other end of the spectrum, smart notes and RFID chips will greatly improve the ability to track and manage field assets. It's all about having the right information at the right time to make the right decision.

MB. Workforce capacity should match demand for workforce. Forecasting demand is a key requirement for cost-efficient delivery of

the right capacity at the right time, and so is sharing capacity. Both of these methods control capacity, but you can also control demand. These lessons will drive 'smart workforce grids', evolving into a sophisticated collaboration across all workforces in the energy industry.

While automating detailed decision-making, workforce management will empower humans to decide wisely and effectively on larger issues: customers will have better visibility and control over their energy consumption and related service activities. Service engineers will access the information and analysis they require, and will be able to instantly mobilize co-workers and assets if needed. Managers will be alerted to any changes, and will plan using accurate 'what if' scenarios.

TG. It all ties back to operational efficiency. Can the energy company schedule one more service call during the day, can the technician perform the task with the right tools, right license, right skill set, and not repeat the service call? The industry is constantly evolving with new

technology like RFID and being able to locate underground assets with LIDAR and handheld devices to decimeter accuracy. With the ability to see the entire workforce in a utilities service territory provides the organization tremendous oversight of where these crews and technicians are in a given time frame. ■

“Training and education of the field workforce along with the technology adoption is paramount to the success of a field solution”

Thell Gillis

Dr. Moshe BenBassat, the Founder, Chairman and CEO of ClickSoftware, is considered to be a guru in the field of service optimization. In 1996, he coined the term 'service chain optimization' as an analogy to supply chain optimization. BenBassat has educated numerous companies on how to best leverage the technologies offered today in order to improve the throughput of their service operations and responsiveness to their customers.

