Newton-Evans Research Company's

Market Trends Digest

August 2010

North America Developments in the EMS, SCADA & DMS Market

The World Market Study of SCADA, Energy Management Systems and Distribution Management Systems in Electric Utilities: 2010-2012 Volume 1: North American Market is now complete. *Volume 2: International Market*, and Volumes 3 and 4 are scheduled for completion by the end of August. Over 100 completed surveys were received from electric utilities in the U.S. and Canada, and 25 responses have been received from other countries so far. Throughout Volume 1 of this report, Newton-Evans has cross-tabulated survey results by size and type of responding utility. The summaries in the first section provide top-level views and synopsis.

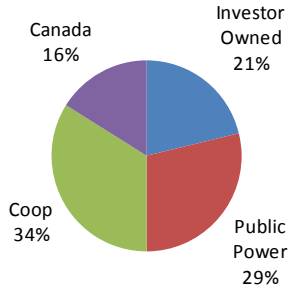
Some information about the sample:

According to the U.S. Department of Energy and American Public Power Association records, at year-end 2008 there were 202 investor-owned electric utilities, 2,008 publicly-owned electric utilities, 877 consumer-owned rural electric cooperatives, and 9 Federal electric utilities. Since Federal electric utilities only make up a fraction of a percent of the total population of U.S. electric utilities, in the survey sample Newton-Evans includes them with publicly owned electric utilities. Both TVA and BPA indirectly serve more than 25 million end-use customers.

Canada's electric utility count stands at 239 in mid-2010. This number includes 21 investor-owned utilities, 5 TSOs, 23 provincial level utilities, 125 municipals, 64 cooperatives and one public power district. The province of Ontario alone accounts for 43% of the number of Canadian utilities.

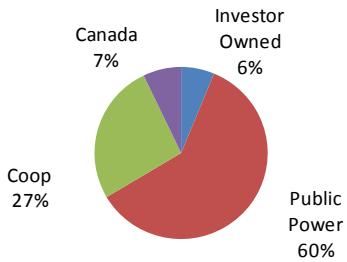
Newton-Evans Sample

Fig. i. Utility Respondents by Type



Actual Distribution

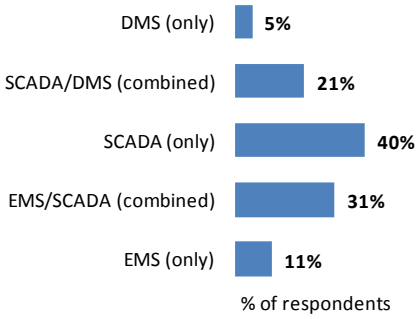
Fig. ii. Proportion of Types of U.S. & Canada Electric Utilities According to the U.S. DOE & PLATTS Directory 2008



The Newton-Evans 2010 sample represents a total of 66,129,387 end-use customers, 198,200 transmission line miles and 1,503,119 distribution line miles in the United States and Canada.

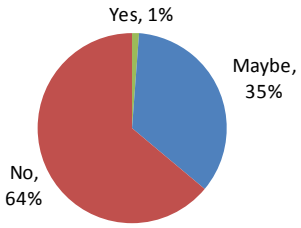
In previous studies, question #1 of the survey asked utility officials to "Please indicate your utility's currently installed EMS/SCADA/DMS." This year, Newton-Evans requested an additional level of detail by asking participants to specify the *type* of system in place:

Fig. 1a-1. Types of Systems in Place



Fewer utilities indicated they were operating a standalone EMS or DMS rather than SCADA or a multi-purpose system. ACS received the most mentions overall for vendor used, followed closely by Survalent. Survalent and ACS also received the most mentions for "current SCADA" while Areva and GE were tied for most mentions of "current EMS/SCADA" combined system. Seventy-three percent have no interest in combining EMS and DMS on a common platform, while forty percent said they are interested in combining DMS and OMS on a common platform. Fifty-four percent are concerned about cyber security if either EMS/DMS or EMS/OMS are combined on the same platform.

Fig. 6b-1. Plans to implement IEC 61850 beyond 2012



The trend in plans for IEC 61850 has not changed significantly since the 2008 study.

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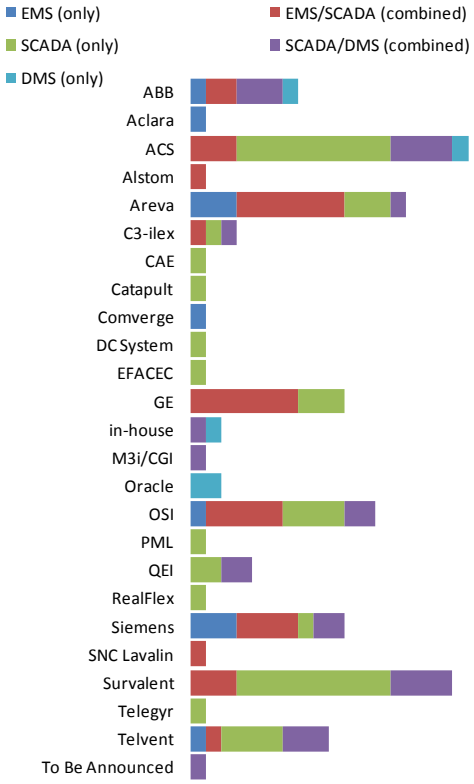
Fig. 1a-2. Mentions of EMS/SCADA/DMS Vendors



Distribution Automation Trends and Outlook in The United States: 2010-2015

By Chuck Newton

There are a number of ad-hoc definitions of electric power distribution network automation. The EPRI definition and the IEEE definition are both widely used in the US.

EPRI's definition of Advanced Distribution Automation: Complete automation of all the controllable equipment and functions in the distribution system, two major components, a flexible electrical (and electronic) architecture and a communication and control system based on an open, standardized communications architecture. Hence, looking into the future, it will be more appropriate to think of it as a "power exchange system", rather than a "distribution system".

IEEE Definition of Distribution Automation: According to the IEEE DA Work Group, the definition of DA is changing. DA had been principally concerned with automatic reconfiguration in the distribution network, an approach enabled by earlier generations of distribution SCADA (as differentiated from substation SCADA) that provided remote control of capacitor banks, some switches, some automatic reclosers and sectionalizers. The definition is expanding with newer applications such as fault detection, fault location analysis, volt and var control and power quality measurements.

Newton-Evans Synopsis of DA: DA is not an application but a system of multiple communications-centric applications that bring the information infrastructure more directly in contact or overlay on the utility's operational infrastructure. Newton-Evans Research views DA as being the sum of all field-based intelligent electronic components of a Distribution Management Systems, or DMS.

Each side (DA and DMS) needs the other component to be successful and to pave the way to a truly smart distribution grid. The new generation of DA activities and applications is broad-based, incorporating sensor-based technology, multiple types of intelligent electronic devices deployed along feeders and perhaps into customer premises, wave-form analysis, strong communications security measures, and significant increases in information processing capability. In the Newton-Evans report, the reader will see the "explosion" of a new generation of IED's beyond the substation fence down to the customer premises. These new applications are based on information handling, processing and storage of large quantities of bulk

data, in many ways, analogous to the development and implications of advanced metering infrastructure.

Market Size Estimates: The US market for distribution automation of electric power medium voltage networks is currently in the emerging stage. 2009 expenditures for distribution automation activities (in addition to the $575 million value of the smart DA field equipment itself) hover around the $250 to $275 million dollar range at this time. This "adoption" curve provides revenue growth expectations.

DA Market Segments: Newton-Evans Research expects that each of the four key segments of the DA market will grow over the 2010 to 2018 periods. These segments are: (1) broadband communications, (2) smart field devices and equipment, (3) device controllers and (4) DA platforms and applications software. This latter category can be further sub-divided into control-center-based approaches and substation-based approaches to device control.

Telecommunications for DA: Dedicated DA-centric telecommunications spending will likely increase, but because of the shared nature of utility infrastructure communications, only dedicated expenditures amounting to about $53 million in 2009 are included in the above chart. In fact, there will be additional tens of millions of dollars allocated for development of a 21st century distribution network-wide communications infrastructure to serve DA, advanced metering, related customer premises data acquisition and reporting (HANs and NANs), and equipment/device diagnostic information retrieval.

Other Applications That Use (or will use) Same Infrastructure Being Used by Feeder Automation Programs: Three quarters of the 64 respondents to our 2007 study are using or will be using the same telecommunications infrastructure (i.e., communications backbone). Among these utilities, 65 percent indicated capacitor bank controls would use the same infrastructure, while 38 percent cited Volt/VAR optimization, demand management or voltage reduction applications, 13 percent indicated load balancing and 25 percent cited other applications, such as AMI, fault location, station alarms, and the like. Importantly, all nine U.S. public power respondents indicated use of the same infrastructure being used in their feeder automation programs with additional DA applications.

The DA communications market segment will move from a serial to broadband approach during the 2010 to 2015 era, and the new communications infrastructure will have strong cyber security defenses as mandated by various federal entities.

The market for broadband communications in a distribution automation environment will be mostly wireless, with a need for approaches that may involve multiple communications technologies and methodologies. The approaches to be taken will consist of utility owned and operated wireless and wire line infrastructure, likely to be supplemented with commercial carrier services.

Device density, topography, spectrum licensing issues, security, and other communications technologies available will have an impact on the telecommunications decisions for particular DA applications. Routing of DA information itself may become a basis for partial communications network re-design. Alternatives include three key options in DA design (control-center-based, substation-based and field-based) all of which are described in the Newton-Evans study entitled Global Market Study of Fault Detection, Isolation and Restoration.

Plans for Capital Spending and O&M Investments in Distribution Automation: The February 2010 edition of the Newton-Evans Research Company's report Global CAPEX and O&M Expenditure Outlook for Electric Power Transmission and Distribution Investments: 2010 to 2011 – Funding Outlook for Smart Grid Development includes observations based on feedback from more than 90 utilities.

Findings from this newest CAPEX study are somewhat positive, compared with the most recent tracking study (July 2009). Each of five smart grid component areas, plus transmission and distribution infrastructure development, has been reported by utilities located in more than 25 countries to more likely be either increased or unchanged rather than decreased from January of last year.

Note that for DA, well over one third of all respondents indicated an increase in spending for DA activities, while 50 percent reported no change from year earlier allocations, and only 8 percent reported any decreases in capital budget allocations for DA. Among North American utility respondents, 37 percent foresee an increase in 2010 DA CAPEX budgets, while 54 percent indicated no change and 10 percent indicated a decrease was likely.

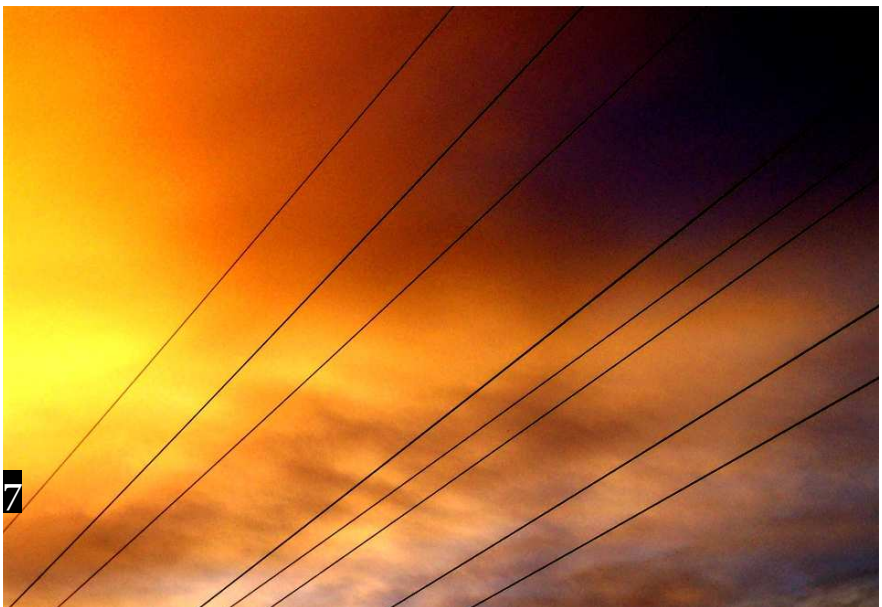
O&M Budget Factors: O&M budgets reflect a somewhat different story. Most categories of O&M spending were less likely to see an increase from the budgets of a year ago. Distribution infrastructure appears to be the key victim, with 17 percent of the respondents indicating a lower figure budgeted for 2010 O&M expense for distribution network operations and maintenance activities. Note that as of early 2010, DA O&M spending looks to hold its own or even be increased, with only 4 percent citing any decrease in the O&M budget for DA activities.

Utility Focus on Smart Grid Components During 2008 to 2010: In a new question included in the 2008 survey for The World Market Study of SCADA, Energy Management Systems and Distribution Management Systems in Electric Utilities: 2008 to 2010, this group of utilities was asked to check the two most important components of near-term work on the Smart Grid. A total of 136 North American utilities provided their comments by indicating their two most important efforts during the planning horizon. On a summary basis, advanced metering infrastructure (AMI) led in mentions from 48 percent of the group. However, EMS/SCADA investments in upgrades, new applications, interfaces was next, mentioned by 42 percent of the group.

Distribution automation was cited by 35 percent as a near-term thrust related to smart grid activities. GIS (geographic information systems) followed with a 30 percent mention rate. Fault detection, isolation and service restoration, a very recently developed term, was mentioned by 20 percent of the group. Eleven sites (8 percent) indicated "no plans" for any near-term focus on smart grid activities.

Smart Grid Priorities: There were substantial changes in Smart Grid priorities when the data is reviewed on numbers of customers served basis. The largest utilities were likely to be investing in AMI and distribution automation in that order, while the utilities serving from 100,000 to 250,000 customers placed slightly more emphasis on DA than on AMI activities. Smaller utilities serving from 10,000 to 100,000 customers were emphasizing GIS work during the 2008-2010 periods.

In summary, the DA market in the United States is poised for reasonable-to-strong growth over the 2010 to 2015 period. Newton-Evans Research is forecasting more than $900 million in DA-related spending this year, climbing to $1,360 million by 2015.



There's No Place Like Home: Workforce Retirement Rate

By Jeff Gerhold, Senior Research Associate

I enjoy hearing that people are retiring. A career well-accomplished; a job well-done; all leading to the well-deserved respite, reward, and recompense of retirement. Finally some time spent out of the office, more time spent at home. My wife is retired and loves it. If I could retire tomorrow, I would.

One of Chuck's concern's – indeed, one of the industry's – is the number of retiring power engineers. Years of experience, knowledge, and talent going out to pasture. Sure, they can be replaced, but sometimes experience and quality are irreplaceable. Our recent Relay Engineer-to-Relay Engineer Study asked what Utilities were doing to attract young engineers: 65 responses covered one end of the spectrum ("absolutely nothing") to the other ("a local college reach-out program"). What is alarming is that far too many Utilities were doing nothing.

Ironically, doing nothing is a part of what retirement is about. Within some spiritual pursuits, not-doing becomes a worthy objective. Emptying the mind in order to calm the body and Spirit does take some doing as well as practice, yet the average person considers this meditative activity "doing nothing". For them it is akin to being dead, something to be avoided, or a waste of time. People retire from 80 hour weeks, only to go back to work for 40. At least it's a start…

As researchers, we are slowly losing to retirement some of our survey participants who have been with us since the early 90's. These are people I've communicated with for nearly twenty years. Back then I telephoned before every survey we conducted, securing permission to fax it for their consideration. I knew their voices; they knew mine. The internet changed that, although it took awhile for this dinosaur to get online. Now the email bounces, or auto-informs us of yet another retirement. We have also lost to retirement Pre-Testers, utility engineers with whom we consult to assure the overall meaningfulness and answerability of our surveys before we send them out. Call me Old School (I am), but the older engineers I've talked with understand the value of sharing information for research purposes. Their replacements often do not. A recent retiree wrote me saying he was pleased "to have enjoyed supporting the industry", but will the engineer who fills his shoes have the same commitment?

My preacher father initially feared retirement because he knew colleagues who had passed away shortly thereafter. He was also concerned that his life's work would disappear. He lasted another 17 years, yet he always supplied the pulpit if asked. Alas, the congregation he helped establish and nourish for 35 years melted

back into neighboring churches within 10 years of his retiring. Fortunately by that time, he was content with what transpired. Many of our retired former respondents go back to work in some capacity: they can't seem to keep their paws out of the engineering pie. Why even my co-worker retired from the local Utility…

The Rolling Stones' refrain repeats *You can't always get what you want…* Chuck wants a hundred survey completions; we get 84. We want the Top 5 Utilities represented; 2 decline to participate. An end-of-year deadline is declared; potential respondents are on holiday so the survey spills over into January. *But if you try sometimes you just might find you get what you need…* We need 25 surveys; we get 35. We need a Pre-Test completed by Monday; we receive it the Friday before. In a business based on statistics and averages, we do get balance.

Utilities need to counterbalance their loss of quality engineers with a talented new crop. Potential retirees may want to consider a balance between working themselves to death with a healthy scaling back of activity once the day arrives. I look forward to that day, but in the meantime, it's the close of my work week. Time to leave, because

There's no place like home…

Measuring the Impact of **GE Energy's Acquisition of SNC Lavalin ECS Business Unit**

By Chuck Newton

Well, it was inevitable that GE would make a play for a larger share of the global EMS/SCADA/DMS market and today the company announced the acquisition of the Montreal-based Energy Control Systems business unit of SNC Lavalin. With this acquisition, Newton-Evans believes GE Energy now ranks fourth in the world in terms of numbers of significant energy management, large SCADA and large distribution management systems. Note that the "GENe" name of the ECS' offerings might just be an added plus!

A few quick facts about the impact of this acquisition:

- SNC Lavalin's ECS business has dozens of large control systems installations in world regions that will now be more receptive to GE Energy solutions including strengthening the company's visibility in China, Egypt and parts of Latin America.

- History: SNC-Lavalin Energy Control Systems, until today a member of SNC-Lavalin Transmission & Distribution, had been a wholly owned subsidiary of the SNC-Lavalin Group specializing in the design, supply, installation, and commissioning of its GENe state-of-the-art real-time control systems. The GENe product portfolio includes Supervisory Control and Data Acquisition (SCADA), Distribution Management Systems (DMS), Energy Management Systems (EMS) and Generation Management Systems (GMS).

- Turnkey Solutions Provider: The ECS business unit provides complete turnkey solutions to the utility sector including consulting, feasibility studies, design, infrastructure construction, real-time control systems, telecommunications, remote terminal units, distribution automation, substation automation, training and technology transfer.

- Successes: This new unit of GE Energy has been supplying SCADA, DMS, EMS and GMS real-time control systems to the power sector for over 40 years, with systems installed in six continents. Based on an open, distributed architecture, these mission-critical systems are helping utilities manage generating stations, high-voltage transmission networks, as well as medium and low voltage distribution networks. GENe helps utilities meet the challenges of Smart Grid, energy savings, demand response and overall improvement of operational efficiency. In 2007 SNC-Lavalin ECS had acquired DTI TELECOM, an engineering

firm specializing in telecommunications and security, thus providing additional expertise to its clients.

With its extensive experience in managing large and complex projects, as well as its solutions-oriented approach, its multicultural team, and its flexibility, SNC-Lavalin Energy Control Systems has been able to offer global solutions for small, medium, or large projects and to quickly adapt to changing market needs. Under GE Energy's wing, the business opportunities for the company will surely expand.

- Open Architecture: SNC-Lavalin's GENe products are based on an open system architecture and are designed to internationally recognized standards. The system architecture is fully redundant for mission-critical high availability, and provides high performance real-time graphics. GENe products support the IEC 61970 and 61968 CIM standards and the NERC/FERC standards for cyber security.

The GENe SCADA supports a wide range of industry-standard and legacy protocols, including DNP3, IEC-60870-5-101/104, Telegyr, Conitel, Modbus, TASE.2 ICCP, ELCOM-90. It is fully integrated with the GENe DMS, EMS and GMS products for real-time network analysis, and can be deployed in substation automation and pipeline management projects.

The GENe DMS product provides utilities with a comprehensive suite of applications and tools for efficient, reliable, and cost-effective management of distribution networks, including Fault Detection, Isolation, and System Restoration, Volt/VAR Control, Outage Management and Intelligent Switching Management. Its sophisticated network model supports three-phase unbalanced distribution networks. The DMS product provides its GIS Gateway for initial population and online incremental updates of the network model and operating displays. The DMS applications are fully integrated with the GENe SCADA and EMS products and use a common real-time database, so analyses and recommendations are based on the real-time state of the network. Smart Grid applications of the GENe DMS product are already being used by several customers around the world. SNC-Lavalin continually invests in the development of the GENe product to further its advancement in Smart Grid technology.

The GENe EMS and GMS products include a full suite of generation management and transmission network security analysis applications that use state-of-the-art algorithms. Based on the Nexant SCOPE engine, the EMS applications are fully integrated with the other GENe products and use a common real-time database. As a result, the displays used for real-time SCADA operations can also be used to display network security analysis

results. GENe EMS applications include State Estimator, Dispatcher Power Flow, Outage Scheduling, Pre-switching Validation, Transmission Loss Penalty Factor, Reactive Reserve Monitor, Contingency Analysis, Contingency Remedial Action, Optimal Power Flow, Volt-var Control, Security-constrained Dispatch, and Dispatcher Training Simulator. GENe GMS applications include Load Forecast, Unit Commitment, Automatic Generation Control, Economic Dispatch, Reserve Monitoring, and Production Costing. SNC-Lavalin continues to invest in the development of the GENe EMS product to provide additio nal functionalities for the EMS market.

- Significant SNC-Lavalin Key Customers include: Hydro-Québec (Canada), NSTAR Electric & Gas (USA), Public Service Electric & Gas (USA) , Provincial Electricity Authority of Thailand, Powerlink Queensland (Australia) , Taiwan Power Company (Taiwan), Sichuan Electric Power Company (China), Alinta (Australia), Energex (Australia), Elektro Slovenija (Slovenia), Elektro Maribor (Slovenia), Elektro Gorenjska (Slovenia), EDELCA (Venezuela), Hebei Electric Power Company (China), Canal Company for Elec. Dist. (Egypt), Alexandria Electricity Dist. Co. (Egypt), Hydro Mississauga (Canada) , and Electriricidad de Caracas (Venezuela).