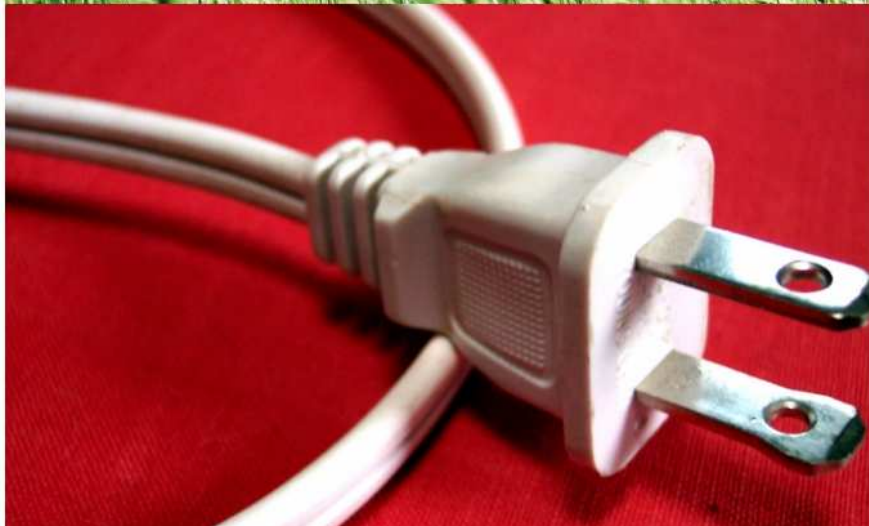




Newton-Evans Research Company's

# Market Trends Digest

May 2010



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## **Distribution Automation Developments in the United States**

The United States market for distribution automation of electric power medium voltage networks is currently in the emerging stage. Expenditures for distribution automation activities (in addition to the \$575 M 2009 value of the smart DA field equipment itself) hover around the \$200-\$250 million dollar range at this time. This “adoption” curve provides revenue growth expectations.

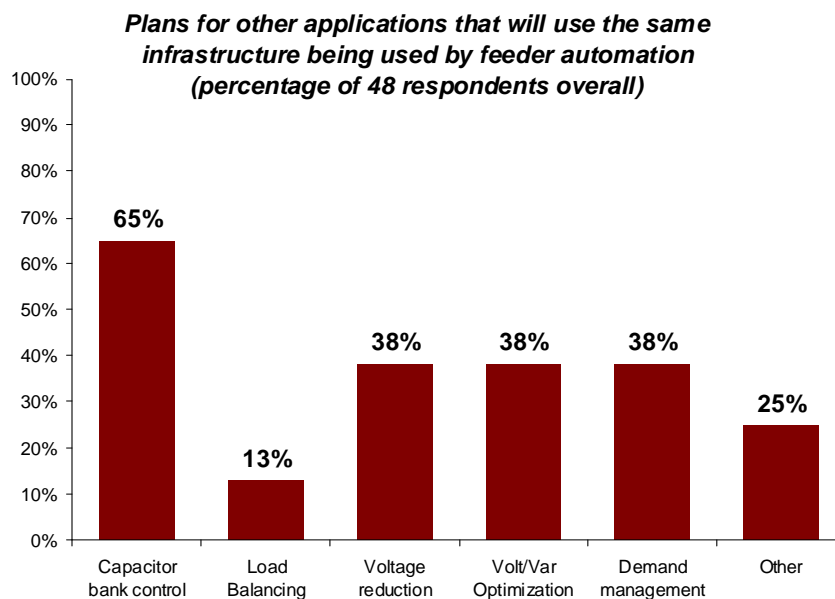
Newton-Evans Research expects that each of the four key segments of the DA market will grow over the 2010-2018 periods. These segments are: (1) broadband communications, (2) smart field devices and equipment, (3) device controllers and (4) applications software. Dedicated DA-centric telecommunications 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, metering, related customer premises data acquisition and reporting, and equipment/device diagnostic information retrieval. See the following chart (Fig. 2) excerpted from our Global Market Study of Fault Detection, Isolation and Restoration indicating the “shared” nature of DA communications networks.

The DA communications market segment will move from a serial to broadband approach during the 2010-2015 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.

The DA demand curve is likely to be re-shaped over the forecast period by continued slow economic recovery, regulatory indecision, and appeals by consumer advocates if the DA costs are viewed negatively and planned to be passed on to customers.



In terms of the number of utilities adopting some DA activities, we have prepared the following five-year outlook table:

*Percent of Utilities with DA Projects Underway or Completed: 2010-2014*

Type of Utility	2010	2011	2012	2013	2014
Investor-Owned-TOP 50	20%	24%	30%	35%	40%
Investor-Owned - Other 150	20%	26%	33%	40%	45%
Public Power Large - TOP 25	15%	15%	20%	20%	22%
Public Power -Other 1000	15%	15%	15%	18%	19%
Cooperatives-Large TOP 25	25%	27%	30%	32%	35%
Cooperatives - Other 900	10%	11%	14%	16%	18%

*Prepared by Newton-Evans Research Company March-2010*

The full version of this report is available for \$395 on our website: [www.newton-evans.com](http://www.newton-evans.com) (Click on "How to Order"). Visa, MasterCard, AmEx and Discover are accepted. To see the Table of Contents please inquire via email with [info@newton-evans.com](mailto:info@newton-evans.com) or call +1 410 465 7316



# **The Potential Role of Technology Transfer for Managing the Emerging Smart Grid: A Look at Commercial Aviation's Cornerstone Operations Control System to Provide Regional and Nationwide Operations Management**

*By Chuck Newton*

Recently I had an opportunity to tour the FAA Telecommunications Infrastructure (FTI) control center. What does the FAA's control center have to do with the Smart Grid? Market Trend Digest readers, the situational awareness capability provided by FTI is close to what we have been discussing for the past few years as an emerging requirement for the national's smarter electric grid operations.

This particular enterprise system is probably the largest (encompassing the entire United States and some international sites) and without a doubt, one of the more sophisticated and most complex communications control and network management systems in existence. I came away from this "system of systems" quite impressed, this after visits to perhaps 60-65 major utility and pipeline operations control centers in several countries in the course of my career.

FTI is perhaps the best example I have seen of a system of effective management tools for nationwide situational awareness and visualization so vital to the daily operation of a communications-centric community as air traffic. The complex engineering design, development, implementation and operation of the current FTI system is the result of a multi-year partnership between the FAA and Harris Corporation. Harris has been a major participant –albeit relatively little-known outside of its customer base - for decades in providing communications assurance for the world's space programs and for various related complex communications systems environments for critical public safety, national defense, and space exploration environments.

First, we need to know more about Harris itself, a firm I call the "gem" of the U.S. Space Coast. Harris Corporation is an international communications and information technology company specializing in complex systems integration activities, serving government and commercial markets in more than 150 countries. Headquartered in Melbourne, Florida, the company has approximately \$5 billion of annual revenue and more than 15,000 employees – including

nearly 7,000 engineers and scientists. Harris is dedicated to developing best-in-class assured communications® products, systems, and services.

Harris, in a nutshell, is a highly capable (but very low-key) and well-regarded company, known around the world to its target markets for unique skills at engineering, construction and operation of hardened wide-range systems and devices designed for difficult (and harsh) communications environments such as outer space and congested inner urban areas. For several years up through the 1990's, Harris had been a control systems integration specialist serving electric power and transportation SCADA and was a partner with General Electric prior to GE's acquisition of the Harris control systems business.

So what makes the Harris-managed FTI system so unique and why should the electric power community or other critical infrastructure segment care? I visited the FTI operations center twice recently, and left the site more impressed after each visit. The system, as presently configured, ensures communication integrity, availability, and security for the nation's commercial aviation activities, under the aegis of the FAA. The FTI center has been in operation for six years now, and remains a vital, leading edge example of what FERC and NERC have been seeking for "situational awareness", "visualization" and highly assured activity in control centers operated by the nation's ISO's and large transmission utilities.

I have this sense that other critical infrastructure segments have similar requirements for communications assurance and situational awareness on a broad scale as well as do members of the electric power community. The FAA has some of the very same concerns for situational awareness, cyber security, and visualization that are now being required of the nation's electric power industry. Further, segregation of user traffic and management traffic within the network allows integrated situational awareness without compromising operational data.


The technology transferability and application "fit" of the FTI system to the electric power industry seems very good from my vantage point. More information can be made available in order to gain a clearer understanding of the capabilities and advanced features of the system, and convey the transferability of this advanced technology to enable a region wide or nationwide communications management capability.

Below are a few excerpts from a full presentation developed by Harris Corporation for use with officials like many of our readers who are also leaders in the planning, management and operation of the nation's bulk electric power industry. Simply because of the "assurance" side of the communications network management system involved, we will use discretion and simply state

that the work effort, the operational team, the secure aspects of the operations center, all provide a true basis for migration of FTI-like capabilities to the electric power community either at a national or regional level. To do so would provide the kind of sophisticated coordination the industry requires for near and mid-term regional, and even national, electric power communications assurance. Take a quick read of the company's slides adopted for this article, and you will see the resemblance of what the FAA has required and what the electric power industry should be able to attain.

*Harris Credentials: Situational Awareness  
FAA Telecommunications Infrastructure (FTI)*

- FTI provides the voice, data, and video communications that support more than 4,000 FAA and DoD facilities nationwide for over 50,000 users
- FTI has 16,800 distributed network devices and over 104,000 manageable components, monitored and reported to the NOCC via a tier-to-tier hierarchy
- "System of Systems" integration
  - Multiple legacy networks into one Enterprise network
  - Operations optical backbone
  - Satellite network
  - Microwave network
  - Security management
  - Service provider interfaces



- FTI provides centralized network, and security, monitoring and control
- Sophisticated processing software correlates resource events to FAA services

The architecture behind both the network communications operations control center and the co-located network security operations control center take advantage of 21st century developmental tools and cyber protection methodologies. FTI services four thousand sites and 50,000 users.

Following is a list of nine key critical requirements established for the FAA Telecommunications Infrastructure (FTI) system and operational infrastructure.

- An architecture tailored to mission critical priorities: ("AIC" not "CIA")
  - (Availability, Integrity, and Confidentiality) instead of (Confidentiality, Integrity, and Availability)
- Backbone = .9999971 availability for on-net services
- FAA Certified System of Systems
- Topology Optimization for bandwidth consolidation

- Value-Added Operational Infrastructure
- Trusted Gateway Connections to the Internet
- Network service model partitioned for availability, reliability, and security
- Carrier Diversity (Multiple telecoms carriers, multiple methodologies)
- These look quite similar to some of the requirements we now see coming to the fore front in the electric power industry.

In summary, a number of industry analysts concerned with operational security issues such as visualization and situational awareness requirements view the Harris FTI system as the advanced version of an enabling “engine” whose root technology can be modified for other applications. The transferability of this advanced technology platform could enable a region-wide, for an ISO, or nationwide communications management capability for NERC or FERC or DoE.

One last thought on complexity of mission: The FAA web site informs us that there are about 2,000 - 7,000 aircraft in the air over the United States at any given time. Just imagine the sophistication of a system of systems to manage and securely control the flow of voice and data communications to help make the U.S.’ air traffic control system the safest in the world. Now imagine having a system that can help manage and secure voice and data communications to enable the efficient and reliable flow of electricity on the emerging smart grid.



U.S. air traffic in mid-morning on February 23, 2010



# **The Worldwide Survey of EMS/SCADA/DMS Systems in Electric Utilities 2010-2012 Status Report**

This publication will be Newton-Evans Research Company's ninth major in-depth international research program on supervisory control and data acquisition (SCADA) systems, energy management systems (EMS) and distribution management systems (DMS). The four volume series will measure current market size and offer projections on a world region basis through the year 2012. It will include a North American Market Survey and Analysis, International Market Survey and Analysis, World Market Assessment and Forecast, and SCADA/EMS/DMS Supplier Profiles for over 25 companies.

This new study will provide an in-depth appraisal of the central and remote site hardware, applications software, and communications services that electric utilities will be requesting during their next round of procurements for SCADA, EMS and DMS systems for the forecast period. In addition to profiling utility requirements individually, the research program will focus on defining the broader product and market requirements that suppliers must meet in order to successfully participate in the SCADA, EMS and DMS programs within the electric utility community worldwide.

The world regions included in the research publications are the North American, European, Latin American, Middle East, African and Asia Pacific markets. The series will provide a comprehensive and informative report on the control systems usage patterns and plans of electric utilities around the world.

Our Early Bird subscribers have submitted topics they would like to see addressed in this survey. We anticipate that the survey portion of this research effort will begin in mid-May, after the final survey has been tested for clarity and completion time.



Newton-Evans has three new studies available. Each study is moderately priced and tailored to the marketing consultant or researcher who needs a brief overview of the topic delivered quickly and at a low cost. These reports may be purchased with VISA, Master Card or AmEx from our website via our secure payment gateway GoMerchant, or an order can be placed over the phone by calling +1 410 465 7316 or toll free in the U.S. 800 222 2856. All reports are delivered via email as a .pdf document. The *Smart Grid Projects 2010* report also includes a Microsoft Excel spreadsheet .

## **Smart Grid Projects 2010: Stimulus-backed and Independently Funded Smart Grid Projects to be Underway in 2010 or Later**

More than 150 U.S. smart grid projects have been identified, summarized and categorized by Newton-Evans Research staff in this compilation of smart grid project summaries. The 60-page report contains narrative summaries of each of the projects, and includes an EXCEL spreadsheet of the identified projects. Utility funded projects and projects that have received DoE stimulus funding are included in the report. Total values of the projects uncovered in this report stand at \$13.4 billion. This report, *Smart Grid Projects 2010*, is available on our website [www.newton-evans.com](http://www.newton-evans.com) for \$195.

## **Distribution Automation Trends, Developments and Retrospectives: 2007-2010**

This summary of key technical and market findings from recently completed Newton-Evans Research studies will assist anyone concerned with the current status and outlook for DA in electric utilities. Priced at only \$395.00, the 29-page compendium report is loaded with solid information for power distribution equipment manufacturers, utility systems integration firms, telecommunications providers, as well as for utility DA systems planners. This report, *Distribution Automation Trends, Developments and Retrospectives*, is available on our website for \$395.

## **Global CAPEX and O&M Expenditure Outlook for Electric Power Transmission and Distribution Investments: 2010-2011**

As reported throughout this third edition of the CAPEX for T&D report series, there is some positive news concerning a planned uptick in CAPEX budgeting among many of the utility officials that were surveyed for this research effort.

The highest percentages of officials reporting CAPEX increases were for the areas of protection and control, and transmission infrastructure budgets. The biggest decrease in CAPEX outlays for 2010 is reported to be in distribution infrastructure. The question is just how much of a change is likely? This report, *Global CAPEX and O&M Expenditure Outlook...* is available on our website for \$495.

## **Newton-Evans' Two Flagship Studies Underway: EMS/SCADA/DMS and Substation Automation Markets**

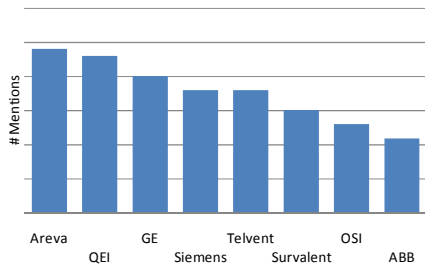
Survey preparation for the *World Market Study of SCADA, Energy Management Systems and Distribution Management Systems in Electric Utilities: 2010-2012* is near completion with data collection scheduled to begin in May. Meanwhile, the questionnaire for *The World Market for Substation Automation and Integration Programs in Electric Utilities: 2010-2012* is still undergoing revision. It's not too late to subscribe to either of these report series and save 5%! Simply fill out the form on the following page and email to [info@newton-evans.com](mailto:info@newton-evans.com) or fax to +1 410 750 7429. If you have any questions about ordering, or would like to find out more about these research programs, give us a call at +1 410 465 7316.

**Need Insight Into Utility Spending On Smart Grid? Contact Us To Find Out Which Newton-Evans Study Is Right For You.**



### Sample Charts:

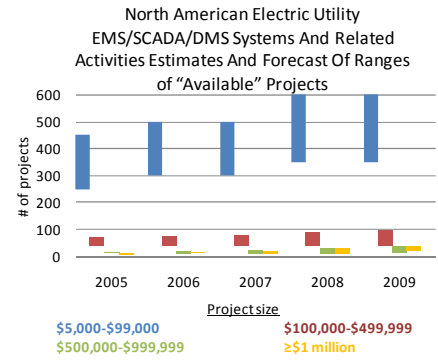
Vendor Representation for Respondent Installations for EMS, SCADA and DMS Systems



	Value Range \$5,000-\$99,999		Value Range \$100,000 - \$499,999	
	Low	High	Low	High
2005	250	450	40	70
2006	300	500	40	75
2007	300	500	40	80
2008	350	600	40	90
2009	350	600	40	100

	Value Range \$500,000 - \$999,999		Value Range \$1 MILLION & OVER	
	Low	High	Low	High
2005	8	15	7	12
2006	10	20	8	15
2007	10	25	10	20
2008	10	30	12	30
2009	15	35	20	35



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Here are the guidelines for companies interested in taking advantage of our prepaid subscription rate for either or both of our 2010-2012 flagship study series.

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## Sign Us Up!

To order *The World Market Study of Supervisory Control and Data Acquisition, Energy Management and Distribution Management Systems in Electrical Utilities: 2010-2012* or *The Worldwide Market for Substation Automation and Integration programs in Electric Utilities: 2010-2012*, phone, fax or mail this form with a check (U.S. dollars) or purchase order number to Newton-Evans Research Company, Inc., 10176 Baltimore National Pike, Suite 204, Ellicott City, Maryland 21042, USA.

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World Market Study of Substation Automation & Integration in Electric Utilities: 2010-2012	<input type="checkbox"/> \$7,125.00	<input type="checkbox"/> \$7,500.00
<b>Total Subscription Cost for Both SCADA/EMS/DMS and Substation Series</b>	<input type="checkbox"/> <b>\$13,500.00</b>	<input type="checkbox"/> <b>\$15,000</b>

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