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ROADMAP: Smart grid industry curls up with a good read

It's a real page-turner -- NIST's roadmap report released yesterday -- and almost everyone we called for comment was busy soaking in the details. But a few key industry leaders gave us their first impressions (read on).

The interim roadmap for smart grid interoperability standards, published yesterday by NIST, rings an IP warning bell of sorts. Among the "near-term actions NIST can take in advancing the Interoperability Framework," the report said, is to conduct "an analysis to select IP suite profiles for smart grid applications."

NIST will not mandate IP but it is suggesting IP is the way to go, Brett Kilbourne, director of regulatory services at Utilities Telecom Council and United Power Line Council, told us yesterday.

"It's probably a reasonable compromise, considering the situation today," he said. "You have legacy technologies out there, so forcing the industry to get over to IP immediately might be tough."

IP suite protocols let utilities "take a repository type of approach so they can plug and play applications regardless of the vendor," David Shpigler, whose namesake strategy management consulting firm has been helping electric utilities put together smart grid and broadband trials and business plans for years, told us yesterday.

EPRI and its subcontractors put together a plan that generally exceeded Kilbourne's expectations. "It was much more comprehensive than I expected," he said.

The "interim roadmap for the development of the Interoperability Framework," as the report describes itself, lays out "the high-level architecture for the smart grid including a conceptual model, architectural principles and methods and cyber security strategies."

The report addresses AMI, DR, plug-in electric vehicles (PEV), cyber security, wide area situational awareness (WASA), market communications and distributed generation/energy storage.

The roadmap team suggested studying "the need for a dedicated [radio frequency] spectrum" for utilities that have since the '90s been lumped together with "incompatible users" in the unlicensed spectrum, Kilbourne noted.

In a section titled "Communications

Interference in Unlicensed Radio Spectrums," the report notes that the smart grid "provides mission-critical capabilities to the US economy and infrastructure" -- and that wireless smart grid device manufacturers and system integrators "struggle with communication interference issues with other devices in unlicensed radio spectrums."

At the recent workshops NIST held, participants asked for licensed spectrum -- perhaps the 700 mhz D block -- for smart grid communications, EPRI wrote.

Part of the problem with the unlicensed spectrum is growing congestion, Kilbourne noted.

The overcrowding problem is senseless, Shpigler said.

Radio stations operate on licensed frequencies and thus their communication signals don't interfere with each other, he reminded. "But if everybody is at 93.7, then it's kind of catch as catch can -- it's whoever yells the loudest gets through.

"Virtually every smart grid infrastructure piece out there requires communication," Shpigler noted. "Data from smart meters needs to get back to the utility for it to act."

So what's the smart grid?

EPRI's report defines the "smart grid" this way: "a modernization of the electricity delivery system so it monitors, protects and automatically optimizes the operation of its interconnected elements -- from the central and distributed generator through the high-voltage network and distribution system, to industrial users and building automation systems, to energy storage installations and to end-use consumers and their thermostats, electric vehicles, appliances and other household devices.

"The smart grid will be characterized by a two-way flow of electricity and information to create an automated, widely distributed energy delivery network. It incorporates into the grid the benefits of distributed computing and communications to deliver real-time information and enable the near-instantaneous balance of supply and demand at the device level."

Some utilities employing Wi-Fi use 2.4 ghz along with other industries and even residences, Shpigler said, "so it challenges

the utility's ability to send wireless signals that are for critical infrastructure."

As NIST works on figuring out a better radio frequency plan, it need only look to Canada where 30 mhz of spectrum was made available specifically for the electric utility industry, Shpigler reported.

"Having a study commissioned by NIST is a great first step," he added, "but at the end of the day, we need more than a study."

Shpigler did not notice any significant gaps in the report, he added. But like most industry experts we contacted yesterday, he said he is still digesting its 270 pages.

NIST should, according to EPRI's report, consider developing "a common pricing model standard" that would cross "all domains that use price."

Such a model is "a key to demand response systems, dynamic pricing in all its forms and energy markets and trading including forward markets," the report said. It suggested NIST work with IEEE, IEC, OASIS (Organization for the Advancement of Structured Information Standards), ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers), NAESB (North American Electric Standards Board, said "NAYZ-bee") and other relevant SDOs (standards development organizations) to figure out how to create a common pricing model that includes at least price, currency, delivery time and product definition.

Industrials feel heard

ELCON, the association of big industrial power users, considers NIST an "honest broker" that is respected for its technical and analytical abilities, the association's President John Anderson told us this week. He trusts that NIST will listen to consumers, large and small, who will ultimately have to pay for smart grid technology.

While others absorbed the report, ELCON issued a press release yesterday on it. In it, Anderson is quoted as saying, "I can tell NIST what consumers do not want. They do not want utilities to be able to reach inside their homes and business and restrict power flow without the consumer's permission. They do not want new pricing mechanisms, adopted under the guise of efficiency, that raise consumers' bills. And they do not want to pay for

supposedly new technology that is then quickly superseded by newer technology, meaning that consumers pay twice -- or more.

"I hope that ELCON and other consumers are part of the process" of hammering together a final interoperability framework, Anderson said in the prepared statement. "Building a smart grid may be a noble and worthwhile objective," but it should "provide consumers with clearly measured and verified new benefits."

ELCON executives felt included in the public debate about the smart grid, even though the discussion seemed dominated by entities that stand to "benefit financially from the implementation of a smart grid" and have far greater resources than ELCON does to devote to the issue, Anderson told us earlier this week.

Utilities, smart grid tech vendors and consultants focused on the emerging

industry are "devoting tremendous amounts of time and money to advocate a smart grid," Anderson said.

ELCON has expressed its concern about the need for proven consumer benefits in FERC filings and NERC forums, he reported.

Firmware upgrades are key

While every vendor knows producing products absent interop standards is risky, they can prepare for missing the mark by making downloadable firmware available to customers, Ron Smith, director of utility solutions for ESCO Technologies, told us in a recent interview.

"So if there is a shift in how you bring certain data back to the enterprise," for example, ESCO and its Aclara RF AMI products can address the change via downloadable firmware, thanks in part to the groundwork laid by Microsoft.

ESCO is looking for gaps that need to be filled in the standards roadmap.

"We're doing use cases and we're looking at the data flow, asking, 'how is the system going to interact and work?'"

To limit the number of upgrades that Aclara will need to address via internet downloads, ESCO participated in the efforts NIST and EPRI have made to round up opinions from all corners of the smart grid industry.

The firm is, according to its Q2 report, making a lot of money and the smart grid boom is reportedly helping (SGT, [May-06](#)).

NIST will collect public comments on the interim roadmap for at least the next 30 days, through www.nist.gov/smartgrid and www.smartgridtoday.com/snip/124.htm.

NIST will then create a final draft that it plans to publish by September. After it collect comments one last time, it plans to release the US smart grid standards roadmap by the end of the year.

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