Application: A.12-04-015, et al

Exhibit No.:

Witness: Don Widjaja

PREPARED REBUTTAL TESTIMONY OF
DON WIDJAJA
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

AUGUST 29, 2012

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PREPARED REBUTTAL TESTIMONY OF
DON WIDJAJA
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

I. INTRODUCTION

The purpose of my rebuttal testimony is to respond to claims regarding the business and regulatory risks faced by San Diego Gas & Electric ("SDG&E" or the "Company") included in the testimony of witnesses on behalf of the Division of Ratepayer Advocates ("DRA"), The Utility Reform Network ("TURN") and Federal Executive Agencies ("FEA").

II. BUSINESS RISK

A. Aggressive Capital Investment Program

Both TURN and FEA assert that the existence of SDG&E's aggressive capital investment program does not differentiate SDG&E from its proxy group, and conclude that construction risk for SDG&E is similar to that faced by the utility industry in general.[1] FEA witness Hill, for example, offers analysis in Charts V, VI and VII in his direct testimony that purports to demonstrate that high levels of capital expenditures and "the negative cash flows that accompany them are normal for the industry."[2] Witness Hill's analysis and conclusion miss the point. While he may be correct that it is not unusual for a company that is in a capital expansion project to have negative free cash flow, he ignores the risk inherent in negative cash flow – *i.e.*, it signals to the investing community that liquidity for the company has become constrained and that the company could have liquidity issues if market conditions change unfavorably. Moreover, financial risk associated with negative free cash flows is only meaningful when adjusted for the

[1] Prepared Direct Testimony of Stephen Hill, p. 80; *see also* Prepared Direct Testimony of William Marcus, p. 28.

[2] FEA/Hill at p. 75.

size of the utility (Total Capitalization). The charts provided by Hill only show industry trends and do not depict the impact of capital investment on the utilities' risk profile. In my direct testimony, I demonstrate that given its size, SDG&E's relative level of capital investment is significantly higher than that of the proxy group.[3]

B. New and Complex Systemic Risk

In my opening testimony, I explained the risk inherent in *simultaneous* implementation of a number of new or modified technologies and regulatory programs. I noted that SDG&E is concurrently implementing California's aggressive 33% Renewable Portfolio Standard ("RPS") program and deploying new technology in the Smart Grid program, while facing the prospect of increasing distributed generation ("DG") and a growing Plug-in Electric Vehicle ("PEV") market. In addressing this aspect of my opening testimony, TURN witness, Mr. Marcus, fails to recognize the interdependency and interconnection of all of these risk factors, which creates a new systemic risk that is complex and difficult to track, and which is likely to produce unforeseen or unpredictable outcomes that can impact SDG&E's earnings. In short, he ignores the risk SDG&E faces in managing *all* of these major changes concurrently and instead addresses individual risk factors in isolation.

In addition to failing to recognize the systemic risk faced by SDG&E, Mr. Marcus offers arguments regarding the individual risk factors that are misguided and unpersuasive. With regard to the business risk associated with implementation of the 33% RPS program, Mr. Marcus points out that the RPS statutory framework permits RPS-obligated entities to seek waiver of compliance requirements under certain circumstances, and that SDG&E is currently on track to meet its RPS compliance obligations. The mere existence of the ability to seek a waiver does

[3] Prepared Direct Testimony of Don Widjaja, Attachment A.

not, however, signify that a waiver would be granted. Mr. Marcus ignores the fact that any such waiver of RPS compliance obligations would likely be heavily contested and is, by no means, guaranteed. Indeed, the question of the Commission's approach to enforcement of the RPS statute is a large unknown at this point. The regulatory uncertainty surrounding the issue of enforcement (as well as other important program details) obviously presents a business risk.

As I explained in my opening testimony, SDG&E's compliance with RPS program mandates is dependent upon renewable energy developers' ability to bring plants online in a timely manner; in the event a renewable project fails, sourcing replacement in-state renewable projects that are highly viable in a timely manner can be extremely difficult. The financing and other challenges experienced by the renewable developers is well-documented. Thus, while Mr. Marcus is correct that SDG&E believes that it will avoid an RPS compliance shortfall, California's comparatively ambitious RPS goals fuel the perception that the California investor-owned utilities ("IOUs") are exposed to greater risks than utilities located in other states.

Similarly, Mr. Marcus improperly dismisses the business risks posed to SDG&E by implementation of various new technologies. Mr. Marcus blithely declares that "any risk elevation that these [technology-related] items potentially bring to bear will be shouldered by ratepayers."[4] I note that the conclusion that ratepayers will, without question, absorb the entirety of the costs potentially incurred by SDG&E is directly at odds with the position typically taken by TURN in other contexts, such as SDG&E's General Rate Case ("GRC") proceeding. Moreover, the ability to request cost recovery does not offer a guarantee of recovery. Informed investors are aware of this fact and, without knowing the magnitude or nature of costs that might be incurred (for example, the potential cost of an attack on utility information systems or the

[4] TURN/Marcus at 43.

energy grid is difficult to quantify), reasonably perceive increased business risk associated with deployment of new technologies. In addition, the advent of new technologies is often accompanied by new threats, vulnerabilities and risks. Shareholders will demand a return on equity ("ROE") adequate to compensate for this risk.

Mr. Marcus agrees with SDG&E regarding the generally acknowledged threat of cyber attack, pointing out that "everybody" in North America is faced with cyber security risk.[5] Indeed, utilities, including SDG&E, identify cyber security risk as a material risk factor in filings with the U.S. Securities and Exchange Commission.[6] The claim by Mr. Marcus that SDG&E's risk is equivalent to that faced by its proxy group is incorrect, however. SDG&E's cyber security risk is greater than that of its proxy group.

The link between adoption of smart grid/advanced metering technologies and cyber risk is undisputed. A recent MIT study described the challenge:

> From a cybersecurity perspective, interfacing so many different hardware and software components introduces vulnerabilities—especially when new and legacy hardware and software need to operate together. For example, implementing customer demand response involves power flow management at the distribution level, interfacing AMI, distribution grid management systems, and billing systems across large numbers of customers, not all of whom will have installed equipment from the same manufacturer, or even the same generation of equipment. The presence of so many interfaced components increases system complexity as well as the number of potential cyber vulnerabilities.[7]

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[5] TURN/Marcus at 43.

[6] Sempra Energy (2012), SEC Form 10-Q Quarterly Report for period ending June 30, 2012, pg. 4; *see* William Pentland, *Cyber Threat to Power Grid Puts Utility Investors at Risk*, Forbes, December 27, 2011, http://www.forbes.com/sites/williampentland/2011/12/27/cyber-threat-to-power-grid-puts-utility-investors-at-risk/ (attached hereto as Attachment B)

[7] Massachusetts Institute of Technology, *Future of the Electric Grid*, December, 2011, p. 205. Available at: http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml#report.

California has been aggressive in pursuing implementation of smart meter technologies. Indeed, a recent Energy Information Administration ("EIA") report establishes that California is one of only 10 states that have ordered Advanced Metering Initiative ("AMI") deployment.[8] Thus, California utilities face heightened cyber security risk in connection with the requirement that they deploy such technologies. As an industry leader in the deployment of Smart Grid technology -- I note that SDG&E was presented with The Nation's Most Intelligent Utility" award for the third year in the row in 2011 and won POWER magazine's 2012 POWER Smart Grid Award on August 1, 2012 -- SDG&E present an obvious target. The degree of risk faced by SDG&E is illustrated by the effort it has undertaken in the area of security and customer privacy; SDG&E's "Smart Grid Deployment Plan 2011–2020" runs 354 pages, and 20% of those pages are devoted to grid and cyber security strategies, including customer privacy. The effort that SDG&E has put into addressing cyber security risk is a testament to the seriousness of this risk. As a practical matter, however, SDG&E remains vulnerable and its ROE must reflect this business risk.

In addition, Mr. Marcus challenges the conclusion that high rates of adoption of DG and PEV in the SDG&E service territory contributes to a perception of higher risk for SDG&E. The existence of issues created by introduction of higher rates of DG and PEV is not disputed – various government agencies and industry groups have published reports on these issues. Indeed, the Department of Energy ("DOE") specifically acknowledges the "heightened risk, both technology and policy, associated with innovative clean energy technologies"[9] in its 2011

[8] Energy Information Administration, *Smart Grid Legislation and Regultory Policies and Case Studies,* December, 2001, pp. 1-2 (Table 1).

[9] DOE/CF-0067 "Strategic Plan", Department of Energy, May 2011, at p.13

Strategic Plan. Plainly, logic dictates that to the extent SDG&E has high rates of adoption of these technologies, the corresponding risk it faces will be greater.

C. Electric Generation vs. Transmission & Distribution

In addressing SDG&E's discussion of utility-owned generation ("UOG"), Mr. Marcus mischaracterizes SDG&E's argument and offers an inapposite response.[10] He argues that SDG&E's UOG-related claims have no merit since SDG&E did not use peer analysis to prove that SDG&E's UOG-related risk is higher than that of its proxy group. Mr. Marcus has misunderstood the point of my testimony. My discussion of SDG&E's increased UOG-related risk focuses on the difference in SDG&E's ***own*** current business risk as compared with its UOG-related business risk in 2008 (during the last cost of capital proceeding). My testimony is intended to illustrate that since 2008, SDG&E's significant increase in UOG has raised its risk level.

Moreover, as he does throughout his testimony, Mr. Marcus overstates the utility's ability to obtain full cost recovery. In discussing UOG, Mr. Marcus argues that pre-approval and memorandum/balancing account treatment *removes* risk for not receiving full recovery of generation projects.[11] Elsewhere in his testimony, however, Mr. Marcus contradicts himself and admits that there exists a "risk of disallowance for California's pre-approved generation projects…"[12] Clearly, the risk of disallowance for cost recovery, even for pre-approved capital projects, as well as the potential for project costs to exceed an approved cap, if one exists, presents potential shareholder risk. Furthermore, once a generation plant is operational, there are risks associated with recovery of investment and operational costs; indeed, DRA had requested

[10] TURN/Marcus at 30 – 32.

[11] TURN/Marcus at 31.

[12] TURN/Marcus at 29.

disallowances for costs associated with operation of the Palomar Energy Center.[13] These are real issues in the world of electric generation and exemplify the type of risks that shareholders face. Any investor who understands electric generation understands that there are inherently more risk in that business, and will require additional return on equity to compensate for the increased risk.

D. Litigation Risk and the Risk Of Insufficient and/or Potential Loss of Insurance Coverage

With regard to litigation risk, Mr. Marcus argues that even though SDG&E faces high litigation risk, "it is ratepayers that foot the bill"[14] through cost recovery in the GRC proceeding. Plainly, however, while SDG&E has the *opportunity* to seek cost recovery related to litigation costs, there exists no guarantee that its request for recovery will be granted. There are two key factors that create uncertainties surrounding cost recovery. First, as I have stated, the Commission does not provide a guarantee that all litigation costs are fully recoverable. For Mr. Marcus to assume that SDG&E will always be granted full cost recovery undermines the Commission's role and pre-judges the outcome of future proceedings. Second, the number of claims filed by litigants and litigation costs are elements that are outside of SDG&E's control, thus accurately forecasting litigation costs for GRC proceedings is very challenging. As I mentioned in my direct testimony, the fact that California IOUs may be held strictly liable under the "inverse condemnation" doctrine for damage to private property when the source is a utility facility, even if the utility is in full compliance with relevant safety regulations and/or there is no proof of negligence, adds to the complexity of forecasting litigation costs. Therefore, there is a

[13] *See* DRA's disallowance recommendation in A.11-06-003 (SDG&E's 2010 Energy Resource Recovery Account (ERRA) Compliance Application). DRA claimed that SDG&E did not achieve least-cost dispatch at Palomar.

[14] TURN/Marcus at 32.

high forecasting risk and actual costs can be significantly higher than what is approved by the Commission in the GRC – this is the risk borne by shareholders.

On the issue of risk associated with insufficient and/or potential lack of insurance coverage, Mr. Marcus, again, attempts to rebut SDG&E's argument by pointing out that SDG&E has the *opportunity* to seek cost recovery for unforeseen insurance-related costs through the "Z-Factor" mechanism. Clearly, however, as I have pointed out, the ability to seek cost recovery does not guarantee that the Commission will grant the request. I note further that in discussing this issue, Mr. Marcus focuses solely on wildfire insurance. As I explained in my opening testimony, however, SDG&E faces inherent operation risk associated with electric and natural gas distribution services and maintains insurance coverage to cover non-wildfire risk as well. Thus, the risk exists that a major non-wildfire incident would not be fully covered and/or would result in reduced availability of non-wildfire insurance.

In sum, as long as the uncertainties of cost recovery exist, shareholders will bear that risk and will demand a ROE adequate to compensate for that risk.

III. REGULATORY RISK

FEA Witness Hill, TURN witness Marcus and DRA Witness Oh_incorrectly claim that SDG&E's business and regulatory risks are significantly reduced due to regulatory mechanisms such as balancing accounts, decoupling and future test years.[15]

Mr. Hill cites statistics from a 2011 study by EEI to support his claim that California enjoys significant regulatory mechanisms that are not available to the proxy group companies.[16] Contrary to Mr. Hill's claim, regulatory mechanisms are widely used in the energy industry. In

[15] FEA/Hill at 70; TURN/Marcus at 14 – 21; Prepared Direct Testimony of Jerry Oh, p. 1.

[16] FEA/Hill at 72.

my direct testimony, I relied on the same EEI source as Mr. Hill to develop a State-by-State comparison table for revenue decoupling adopted in the U.S., which indicates that revenue decoupling is widely adopted and thus has become the status quo. My analysis did not produce the same results as Mr. Hill's and upon further investigation, I conclude that Mr. Hill failed to use the summary table as provided in the study and relies selectively on the datasets provided in the study. For example, the study states that there are three well established decoupling approaches, which are decoupling true up plans, lost revenue mechanisms ("LRAMS") and fixed variable pricing. Therefore, to provide a complete picture of the use of revenue decoupling in the industry, all three approaches should be considered. Mr. Hill only uses data associated with decoupling true up plans and ignores the other two approaches in his analysis. No explanation is offered as to why Mr. Hill only uses partial data for his analysis. Had he utilized *all* the information, Mr. Hill would have come to the same conclusion as I did. In order to validate that revenue decoupling is widely adopted within the proxy group of companies, I performed additional analysis (set forth in Attachment A hereto) using the same EEI study and concluded that 84% of the proxy group companies operate in states that have adopted at least one form of revenue decoupling.

With regard to use of future test years, it is true that future test years do provide some risk mitigation, and are favorably viewed by market participants.[17] Nonetheless, TURN witness, Mr. Marcus, overlooks the fact that the use of future test years is not unique to California utilities.

[17] For example, Moody's reports that "in situations where industry conditions are changing rapidly, such as when costs are increasing or capital expenditures growing, historical test years are generally less useful as an accurate data point for setting future rates. In addition, the use of historical test years can contribute to regulatory lag in that a utility must usually file another rate case to recover those costs not accurately predicted with the use of the historical test year. As a result, utilities that use historical test years typically do not earn their allowed rate of return on an ongoing basis and experience persistent regulatory lag in the recovery of costs." Moody's Investors Service, "Special Comment: Cost Recovery Provisions Key To Investor Owned Utility Ratings And Credit Quality," (June 18, 2010) at 8.

The use of future test years, like decoupling mechanisms, is becoming common and expected by utility investors.[18]

Based on the pervasiveness of risk-mitigation structures in place at the proxy group companies, there is no basis to assume that investors consider SDG&E to be less risky than the proxy group companies. Since the cost of equity of those proxy companies already reflect any perceived risk reducing benefits of the regulatory mechanisms, no further adjustment is necessary for the Company. To do otherwise would be improper double-counting, as explained by Dr. Morin.[19]

Witness Oh's claim regarding the risk mitigation provided by balancing account treatment is similarly incorrect. In discussing balancing account treatment, Mr. Oh makes a few high-level assumptions that lead to a flawed conclusion. Mr. Oh's assertion that a large portion of the utility's revenue/expenses are fully protected is misleading. While it is true that certain balancing accounts provide SDG&E the *opportunity* to recover the costs of certain programs outside the normal GRC mechanism, there are many nuances to this that put much of these costs at risk. Some balancing accounts related to fixed costs protect SDG&E (and customers) from variations in sales and the cost of procuring power and natural gas. However, they do not provide protection against variations in operating or project expenses. All balancing accounts are not uniform and guaranteed to recover all cost; some balancing accounts are one-way, all require Commission approval, other are delayed, and even more are not recoverable until further regulatory action.

[18] *See* Attachment A.

[19] Prepared Rebuttal Testimony of Roger A. Morin.

For example, SDG&E has certain accounts that serve as one-way accounts and/or are subject to caps where SDG&E is authorized to recover amounts up to a certain limit but is not allowed to recover any dollars spent above that cap. SDG&E's tree trimming balancing account is an example of this type of account. SDG&E has a program in place to maintain the vegetation in its service territory in order to reduce the risk of wildfires and remain in compliance with applicable Commission regulations. SDG&E spends the money necessary to maintain the program and is capped at what it can collect. Historically, it has been necessary to spend above the authorized caps to stay in compliance and SDG&E shareholders have absorbed the difference. (Note that if SDG&E's costs are below the authorized amount, it must return that over-collection to ratepayers – thus there is a one-way benefit to ratepayers). In these types of accounts with a cap or one-way treatment, there is no certainty of cost protection. Moreover, all regulatory accounts are subject to Commission review and potential disallowance. In the case of SDG&E's Energy Resource Recovery Account ("ERRA") commodity account, for example, DRA has been increasingly aggressive in recommending disallowance of costs, which present greater regulatory risk.

It is important to note that not all regulatory accounts can be lumped together and assumed to have full recoverability. SDG&E also maintains a type of regulatory mechanism called a "memorandum account." In the case of memorandum accounts, while the existence of these accounts permits SDG&E to track the costs for potential future recovery, SDG&E still must seek formal approval of these costs in a separate application and approval is not guaranteed. The memorandum account only serves as a vehicle to avoid retroactive ratemaking. The Commission commonly states when it approves memorandum accounts that it is not to be deemed as an approval of the recovery of the costs themselves.

Witness Oh draws the conclusion that "the percentage of revenues that are recoverable through balancing accounts is much higher than those identified by the IOUs when including the GRC authorized revenues."[20] This suggests that witness Oh does not fully understand the regulatory mechanism that produces authorized revenue requirements in a GRC. The authorized revenue requirement produced in a GRC decision gives the utility the ability to earn its return on ratebase for base business, and the opportunity to cover its costs of operating the company and providing safe and reliable service. This authorized revenue is not guaranteed to cover costs and provide an adequate return. It is only through the prudent supervision and guidance of senior management that this might be accomplished. However, the GRC is based on forecasts and as such many factors can contribute to costs overruns that are not simply "under the direct control of the utilities."[21] Further, witness Oh does not mention what expenses are under the direct control of the utilities and seems to imply that all expenses are 100% controlled. Clearly, this is not the case.

Witness Oh appears to believe that if he adds the revenue requirement in the GRC to the amount of revenue that is balanced, the utility becomes less risky. This certainly double counts the balancing account revenues that are included in the GRC, such as Tree Trimming, Distribution Integrity Management, and others. Further, this assumes that there is some kind of guarantee over the GRC revenue requirements to cover operating expenses. At this point, he is confusing the volumetric risk with operational risk, the latter of which is not covered by balancing.

[20] DRA/Oh at 2.

[21] DRA/Oh at 2.

Notwithstanding the existence of balancing accounts, memorandum accounts, and future test years, a utility is not guaranteed cost recovery. Indeed, cost recovery is often vigorously challenged by the very parties who suggest here that it is a foregone conclusion. SDG&E faces uncertainty related to its decisions made prior to receiving clear cost-recovery authority from the Commission. Once authority is granted, there is risk of disallowance, risk of spending above stated caps, and risk of delay in approval of projects.

IV. SUMMARY AND CONCLUSION

In conclusion, SDG&E believes that its recommended ROE of 11.0% reflects the business and regulatory risks that the Company faces and is a fair and reasonable return for investors.

This concludes my prepared rebuttal testimony.

ATTACHMENT A

Revenue Decoupling and Future Test Years – Proxy Comparison

ATTACHMENT A
REVENUE DECOUPLING & FUTURE TEST YEARS – PROXY COMPARISON

State(s) Company Operates in	Proxy / Company Name	Revenue Decoupling	Forward Test Years
New York	Consolidated Edison Inc	Yes	Yes
Florida	TECO Energy, Inc.	Yes	Yes
California	SDG&E	Yes	Yes
California	PG&E Corp	Yes	Yes
California	Edison International	Yes	Yes
New Jersey	Public Service Enterprise Group Inc	Yes	No
Ohio	Vectren Utility Holdings, Inc.	Yes	No
Virginia, North Carolina	Dominion Resources	Yes	No
Michigan	DTE Enterprises, Inc.	Yes	Yes
Michigan	CMS Energy Corporation	Yes	Yes
Texas, New Mexico	El Paso Electric	No	Pending
Ohio, North Carolina, South Carolina	Duke Energy Corp	Yes	No
Illinois, Missouri	Ameren Corp	Yes	Yes
Massachusetts	NSTAR	Yes	No
Michigan, Wisconsin, Minnesota	Integrys Energy Group, Inc.	Yes	Yes
Texas, Louisiana, Arkansas	Entergy Corp	Yes	No
Pennsylvania	PPL Corp	No	No
Pennsylvania	Exelon Corp	No	No
Texas, Minnesota, Arkansas	CenterPoint Energy	No	Yes
Arizona	UniSource Energy Corporation	No	No
Arizona	Pinnacle West Capital	No	No
South Carolina	SCANA Corp	Yes	No
Wisconsin	Wisconsin Energy Corporation	Yes	Yes
Wisconsin	MGE Energy, Inc.	Yes	Yes
Washington	Avista Utilities (E)	Yes	No
Connecticut	UIL Holdings Corporation	Yes	Yes
Massachusetts, Connecticut, New Hampshire	Northeast Utilities	Yes	Yes
Minnesota	ALLETE, Inc.	Yes	Yes
Colorado, Minnesota, New Mexico	Xcel Energy Inc.	Yes	Yes
Oregon	Portland General	Yes	Yes
Nevada	NV Energy, Inc.	Yes	No
Colorado, Kansas, Iowa, Nebraska, South Dakota	Black Hills Utility Holdings Inc.	Yes	Yes
Arkansas	OGE Energy Corp.	Yes	No
New Mexico	PNM Resources	No	Pending
Idaho	IDACORP Inc.	Yes	No
District of Columbia	Pepco Holdings, Inc.	Yes	No
Montana	NorthWestern Corporation	Yes	No
Hawaii	Hawaiian Electric	Yes	Yes

% of Proxy Group with Revenue Decoupling in place :	**84%**
% of Proxy Group with Forward Test Years in place or pending :	**55%**

Source: EEI, "Innovative Regulation: A Survey of Remedies For Regulatory Lag", April 2011

ATTACHMENT B

Forbes Article: ***Cyber Threat to Power Grid Puts Utility Investors at Risk***

Forbes

William Pentland

ENERGY

12/27/2011 @ 10:16AM |3,080 views

Cyber Threat to Power Grid Puts Utility Investors at Risk

Image by Getty Images via @daylife

The electric-utility industry's concerns about cyber security has escalated sufficiently for several investor-owned utilities to include cyber-attacks as a material risk factor in recent filings with the U.S. Securities and Exchange Commission.

In November, Consolidated Edison of New York, a large electric and gas utilities serving customers in New York City and Westchester County, included cyber-attacks as a risk factor that could affect investors quarterly report (10-Q) for the first time. Con Edison's 10-Q stated:

A Cyber Attack Could Adversely Affect the Companies. The Utilities and other operators of critical energy infrastructure may face a heightened risk of cyber attack. In the event of such an attack, the Utilities and the competitive energy businesses could have their operations disrupted, property damaged and customer information stolen; experience substantial loss of revenues, response costs and other financial loss; and be subject to increased regulation, litigation and damage to their reputation.

Although Con Edison is not the first utility to disclose cyber-security a serious threat in SEC filings, it is perhaps the first to describe cyber-attacks as a stand-alone risk category. For example, Pepco Holdings, a large power and gas utility serving customers in Delaware, the District of Columbia, Maryland and New Jersey, includes cyber-attacks in a broader, catch-all

disclosure about terrorism and other mega-catastrophes. For instance, in Pepco's most recent 10-Q, the threat of cyber-attacks is described as one of many risks associated with "[e]ffects of geopolitical events, including the threat of domestic terrorism or cyber attacks."

While I may be splitting hairs to suggest any meaningful difference in these disclosures, it seems abundantly clear that cyber-security is no longer sitting on the industry's sidelines. And for good reason, according to James Andrew Lewis, a fellow at the Center for Strategic and International Studies, a think-tank based in Washington, D.C. In a 2010 report, Lewis wrote:

There is evidence that unknown foreign entities have probed the computer networks of the power grid. Some electrical companies report thousands of probes every month, although we do not know (and it may not make much difference) whether these were cyber crime or part of a military reconnaissance effort. There is also anecdotal reporting that potential military opponents have done the reconnaissance necessary for a cyber attack on the power grid, mapping the underlying network infrastructure and locating potential vulnerabilities.

Although Lewis concluded that hackers would probably not be able to bring down the power grid for a prolonged period, the grid's vulnerabilities to hackers are expanding more rapidly than the prophylactic measures needed to protect the grid from attack. This grim conclusion is among the many grim findings of a major new study on the "Future of the Electric Grid" by researchers at the Massachusetts Institute of Technology.

This article is available online at:
http://www.forbes.com/sites/williampentland/2011/12/27/cyber-threat-to-power-grid-puts-utility-investors-at-risk/