

Niagara Mohawk Power Corporation
d/b/a National Grid

PROCEEDING ON MOTION OF
THE COMMISSION AS TO THE
RATES, CHARGES, RULES AND
REGULATIONS OF NIAGARA
MOHAWK POWER CORPORATION
FOR ELECTRIC AND GAS
SERVICE

Testimony and Exhibits of:

Kenneth D. Daly
Keri Sweet Zavaglia
Information Services Panel

Book 1

April 28, 2017

Submitted to:
New York State Public Service Commission
Case 17-E-_____
Case 17-G-_____

Submitted by:
Niagara Mohawk Power Corporation

nationalgrid

Before the Public Service Commission

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID

Direct Testimony

of

Kenneth D. Daly, CFA

Dated: April 28, 2017

Testimony of Kenneth D. Daly

1 **I. Introduction and Overview**

2 **Q. Please state your name and business address.**

3 A. My name is Kenneth D. Daly, and my business address is One MetroTech Center,
4 Brooklyn, New York 11201.

5
6 **Q. Please explain your role and principal responsibilities at National Grid.**

7 A. I am the Jurisdictional President and Chief Operating Officer for National Grid's New
8 York business. I am responsible for the performance of The Brooklyn Union Gas
9 Company d/b/a National Grid NY ("KEDNY"), KeySpan Gas East Corporation d/b/a
10 National Grid ("KEDLI"), and Niagara Mohawk Power Corporation d/b/a National Grid
11 ("Niagara Mohawk" or the "Company"). I oversee all aspects of KEDNY, KEDLI, and
12 Niagara Mohawk's business, including electric and gas distribution operations, financial
13 performance, customer interactions, regulatory affairs, and community involvement. I
14 also serve on the Boards of Directors for KEDNY, KEDLI, and Niagara Mohawk.

15
16 **Q. Please describe your educational background and business experience.**

17 A. I received a Bachelor of Arts in English from St. Francis College in 1988. I received a
18 Master of Business Administration degree from St. John's University in 1992 and a
19 Master of Science degree in Human Resource Management from NYU-Polytechnic
20 University in 1999. I achieved the Chartered Financial Analyst designation in 2002. In
21 2014, I completed the Advanced Management Program at Harvard Business School. I
22 am an Adjunct Professor of Business and Finance at St. Francis College and I serve on

Testimony of Kenneth D. Daly

1 the Boards of Directors for a number of New York energy, business, academic, and non-
2 profit organizations.

3
4 I joined KEDNY in 1988 as a Management Trainee in the Meter Reading area in
5 Brooklyn, and spent my early career in various roles in Customer Relations and Human
6 Resources. From 1997 to 1998, I served on the integration team supporting the merger of
7 KeySpan Corporation and the Long Island Lighting Company. In 2005, I was named
8 Vice President, Financial and Employee Related Services, responsible for human
9 resources, customer relations, collections, and accounting. I served as a Merger
10 Coordination Officer in the National Grid-KeySpan merger and was named the Chief
11 Financial Officer for Global Gas Distribution in 2007. In 2009, I was named the Global
12 Financial Controller of National Grid plc. I was named President of the New York
13 Jurisdiction in 2011, a role I have held for six years.

14
15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to present an overview of the Company's electric and
17 gas rate filings and introduce the witnesses supporting those filings. I will provide
18 background concerning Niagara Mohawk's business, including a discussion of the
19 circumstances that have affected the Company since its last base rate case in 2012 and a
20 review of its recent ratemaking history. I will then address the factors driving the
21 Company's need for rate relief and describe the important steps taken to prepare for
22 these filings. I will highlight the important issues in this case and explain how the

Testimony of Kenneth D. Daly

1 Public Service Commission's ("Commission") granting the relief we seek will further
2 the objectives shared by the Company, our customers, and the State of New York.

3
4 **Q. Please provide an overview of the Company's rate filings.**

5 A. Niagara Mohawk seeks to adjust its base electric and gas delivery rates to eliminate
6 electric and gas revenue deficiencies of \$326 million and \$81 million, respectively, in the
7 twelve months ending March 31, 2019 ("Rate Year"). To mitigate bill impacts for
8 electric and gas customers and maintain rate stability, the Company is proposing to
9 amortize a portion of its deferred liabilities to offset the Company's need for rate relief.
10 While the Company's filings propose new rates for the Rate Year only, Niagara Mohawk
11 is interested in exploring a multi-year rate plan settlement that would allow for a phase in
12 of these revenue increases and the ability to manage the impact on customers' bills. To
13 facilitate such discussions, the Company has included cost projections for two years
14 ("Data Years") beyond the Rate Year.

15
16 The energy services Niagara Mohawk provides are essential to the wellbeing of
17 customers and communities in Upstate New York. Customers rely on the Company 24
18 hours a day, 365 days a year to safely power their homes and businesses. For
19 generations, Niagara Mohawk has been a trusted provider of utility services in New
20 York, delivering electricity and natural gas to over two million customers through
21 networks that have provided reliable service for decades.

Testimony of Kenneth D. Daly

1 Today is an exciting time in the utility industry where technology and innovation hold the
2 promise of a more dynamic, efficient, and sustainable energy future. But that future can
3 only be realized through investments, and the need for those investments must be
4 balanced against the financial impacts on customers of increases in the costs of vital
5 services. To that end, the Company's rate filings present comprehensive, measured
6 proposals for modernizing Niagara Mohawk's electric and gas infrastructure, enhancing
7 safety, reliability and customer service, assisting our most vulnerable customers,
8 delivering economic and environmental benefits to the region, helping commercial and
9 industrial customers manage their energy consumption to stay competitive, and
10 promoting energy technologies and markets that support New York State's energy vision.
11 These filings balance the need for investment with the impact on customers' bills.

12
13 **Q. Please summarize the significant proposals in the rate filings.**

14 A. First and foremost, the proposals reflected in the Company's rate filings are focused on
15 efficiently delivering the investments and programs needed to achieve our primary
16 objective of providing safe and reliable electric and gas service to customers in New
17 York. While strengthening the core business, the Company is also laying the foundation
18 for a new energy future. The investments and programs described in these rate filings
19 will enable Niagara Mohawk to take significant steps toward modernizing its energy
20 infrastructure and developing networks capable of serving the changing needs of our
21 customers today and in the future. However, the current rates will not permit the
22 Company to recover its cost of providing safe and reliable service and, as a consequence,
23 a rate increase is needed to facilitate the necessary investments.

Testimony of Kenneth D. Daly

1
2 With respect to the electric system, the changing energy landscape requires investment to
3 enhance and upgrade the Company's infrastructure. The capital and operating
4 expenditures reflected in these filings will ensure the continued provision of safe,
5 reliable, and cost effective service, including approximately \$650 million in core electric
6 transmission, sub-transmission, and distribution infrastructure in the Rate Year.
7 Investments are also needed to modernize the system and establish a framework for
8 enabling an animated energy marketplace, facilitating the integration of distributed
9 energy resources ("DER"), empowering customers, and furthering the State's and
10 Commission's policy goals. Many of the investments to modernize the electric system
11 will also be used to support the Company's Distribution System Platform ("DSP") as part
12 of the Company's effort to plan, interconnect, control, monitor, and manage DER on the
13 electric distribution system.

14
15 To encourage development and innovation for the benefit of customers, the Company is
16 proposing a set of outcome-based Earnings Adjustment Mechanisms ("EAMs") that will
17 measure and reward the Company's success in delivering outcomes that customers value.
18 In this respect, this is a transformational rate filing that will advance the utility business
19 model by creating a framework to encourage efficiency and market-based solutions to
20 address future energy needs.

21
22 The Company is focused on protecting its networks from the threat of increasingly severe
23 weather events and quickly restoring service to customers impacted by storms. Already

Testimony of Kenneth D. Daly

1 in 2017, the Company has responded to three separate storm events that affected the
2 entire Upstate service territory. A January ice and wind event affected more than 85,000
3 customers with the majority of interruptions occurring in Central New York, while in
4 March two separate wind events affected more than 180,000 and 112,000 customers
5 primarily in the Western and Eastern New York regions, respectively. In each case,
6 service was timely restored thanks to the hard work of the Company's field crews with
7 the support of additional resources from across National Grid. I am very proud of the
8 Company's storm response efforts and appreciate the positive recognition that the
9 Company received from customers, municipal partners, and industry peers. However, the
10 impacts of climate change and expectations of our customers demand continuous
11 improvement in this critical area. To address this challenge, Niagara Mohawk is
12 increasing funding for critical maintenance programs, geographic information systems,
13 and communications on the electric system, to improve reliability, resiliency, and our
14 ability to withstand and respond to future weather events. In combination with capital
15 investments to harden the system, these efforts will help maintain service and power
16 quality for our customers in the face of increasingly frequent and intense storms.

17
18 For the gas business, the Company's gas infrastructure investment plan recognizes the
19 need to enhance and continue pipeline integrity and reliability programs, upgrade the
20 systems supporting the gas operations, support gas growth, and balance customer bill
21 impacts. To improve the safety and reliability of the gas distribution system, and reduce
22 methane emissions on our older gas infrastructure, the Company will maintain its current
23 aggressive pace of leak prone pipe replacement (50 miles per year), which puts us on

Testimony of Kenneth D. Daly

1 pace to eliminate these facilities several years ahead of the Commission's target date.
2 The gas investment plan also includes a project to mitigate a significant supply/capacity
3 constraint in the eastern portion of the Company's service territory, as well as pipeline
4 and reliability programs that will improve system performance. The Gas Infrastructure
5 and Operations Panel addresses the Company's efforts to expand the availability of gas
6 service through targeted capital investments and other means.

7
8 The Company is also proposing a holistic program to upgrade and enhance the systems
9 that support our gas business. The Gas Business Enablement ("GBE") project will
10 transform National Grid's U.S. gas operations through business process improvements
11 and new technology investments focused on reducing operational risk, enhancing
12 performance, and creating a platform to support future growth and customer demands.

13
14 Importantly, Niagara Mohawk is focused on gas safety and committed to taking the steps
15 necessary to improve its safety performance. National Grid is proud of its long history of
16 safe and reliable operations in New York, but the Company's recent compliance
17 performance, as reflected in the results of the Department of Public Service Staff's
18 ("Staff") gas field and records audits, is not yet where it needs to be. Compliance with
19 safety regulations is a primary focus. The bar has been raised on safety and compliance
20 for all gas utilities, and the Company will do everything it can to meet the heightened
21 expectations of regulators and customers. The Gas Infrastructure and Operations and Gas
22 Safety Panels discuss investments and programs designed to enhance safety and improve
23 compliance performance, including proposals to improve training for Company field

Testimony of Kenneth D. Daly

1 personnel and contractors, expand public outreach and education on gas safety, conduct
2 additional quality assurance inspections, and advance an independent assessment of the
3 Company's safety and compliance performance. The Company is also proposing to
4 modify its gas safety performance metrics to provide more stringent performance targets
5 in areas such as damage prevention and leak management, and to adjust its safety
6 violations metric to focus more attention on addressing compliance deficiencies going
7 forward. To drive further improvement, the Company's proposals also include positive
8 incentives that will allow Niagara Mohawk to earn modest incentives for achieving
9 superior performance levels in key main replacement and leak reduction metrics.

10
11 Niagara Mohawk's expanding infrastructure programs, new safety initiatives, and higher
12 volume workload also necessitate an investment in people. Accordingly, the Company is
13 proposing to add more than 280 positions over three years to support electric and gas
14 operations, grid modernizations, customer, and low income programs. As I discuss
15 below, the utility industry faces a demographic challenge with its aging workforce, and
16 staffing these new positions will help Niagara Mohawk maintain the qualified workforce
17 needed to deliver critical energy services.

18
19 The costs to operate Niagara Mohawk's gas and electric businesses are increasing as a
20 result of various market and external factors, including new safety requirements for
21 distribution companies. At the same time, investments to modernize infrastructure come
22 at a significant cost. Understanding the need to manage the level of investment, Niagara
23 Mohawk has developed a proposal in this case that delivers benefits without overly

Testimony of Kenneth D. Daly

1 burdening customers. Indeed, the Company has attempted to forecast carefully the
2 infrastructure investment needed to fulfill its public service obligations, advance energy
3 policy priorities, and balance customer bill impacts.

4
5 Niagara Mohawk appreciates that energy bills are a hardship for its financially vulnerable
6 customers, and the Company is committed to providing these customers with much
7 needed financial support through expanded low income programs. The Company is
8 significantly increasing funding for its low income programs and expanding its outreach
9 efforts to identify and enroll customers in available assistance programs. As I discuss
10 more fully below, the Company's new Energy Affordability Program has the potential to
11 provide more than \$70 million in low income benefits, an unprecedented level of low
12 income support and a more than threefold increase in the current budget for these
13 programs. In addition to increasing benefit levels, Niagara Mohawk's efforts to identify
14 additional low income customers is expected to increase by approximately 55,000 the
15 number of program participants receiving benefits. Expanding the impact of our low
16 income programs is especially important at a time when proposed federal budget cuts
17 threaten the Low Income Home Energy Assistance Program ("LIHEAP") that provides
18 heating assistance to thousands of the Company's low income customers.

19
20 The Company is managing costs everywhere it can, using deferrals to offset increases and
21 taking steps to protect the most vulnerable customers. The Company's revenue
22 deficiencies arise even though National Grid has been focused on managing operating
23 costs. In recent years, the Company has implemented a number of cost efficiency

Testimony of Kenneth D. Daly

1 measures. For example, the Company's efforts to negotiate new collective bargaining
2 agreements with its unions will permit the Company to continue to deliver high quality
3 services in a cost-effective manner. As discussed more fully by the Revenue
4 Requirements Panel, Niagara Mohawk's revenue requirement initially reflects a one
5 percent productivity adjustment that has been applied to past Company rate filings. In
6 addition, to allow customers to share in the benefits of the Company's ongoing efforts to
7 drive cost efficiencies, the revenue requirement reflects the impact of various U.S.
8 efficiency programs. Specifically, the filing describes National Grid's effort to deliver
9 sustainable savings through its Performance Excellence ("PEX") strategy, which
10 combines end-to-end process work with the development of leadership behaviors and
11 local team capabilities that maximizes employee engagement and improves service to
12 customers. Combined, the level of annual savings in the revenue requirement totals
13 \$12.8 million, which is significant.

14
15 **Q. Are the Company's filings consistent with the goals and objectives outlined in New**
16 **York State's Energy Plan?**

17 A. Yes. National Grid supports New York State's energy policies. As demonstrated
18 throughout these filings, Niagara Mohawk is committed to modernizing its electric and
19 gas infrastructure to promote resiliency, reliability and growth, to deploying new
20 technologies to enhance safety, reliability and customer engagement, to promoting
21 market solutions that drive efficiencies and enhance customer choice, and to assisting
22 customers with managing their energy usage. The Company looks forward to working

Testimony of Kenneth D. Daly

1 with all stakeholders to promote these policies in a manner that benefits customers and
2 communities.

3
4 **Q. Please introduce the other witnesses who provide testimony in support of the**
5 **Company's filing.**

6 A. In addition to my testimony, Niagara Mohawk's rate case filings are supported by the
7 testimony of twenty-two witnesses or witness panels. These witnesses and the subject
8 they address are as follows:

- 9 • The Electric Infrastructure and Operations Panel consists of Keith P. McAfee, Vice
10 President, New York Electric, Christopher Kelly, Senior Vice President of Electric
11 Process and Engineering, Allen C. Chieco, Ombudsman Distributed Generation, New
12 York Electric, Peter F. Altenburger, Distribution Overhead and Underground Lines,
13 New York East, and Robert D. Sheridan, Director, New Energy Solutions. The panel
14 discusses the Company's electric transmission and distribution capital additions,
15 transmission and distribution operations and maintenance ("O&M") costs, as well as
16 several of Niagara Mohawk's Distributed System Implementation Plan ("DSIP")
17 investments.
- 18 • The Gas Infrastructure and Operations Panel consists of Ross Turrini, Senior Vice
19 President – Gas Process and Engineering, John S. Stravrakas, Vice President for Gas
20 Asset Management, Keri Sweet Zavaglia, Vice President of New York Performance
21 and Strategy, and Johnny Johnston, Senior Vice President for Gas Enablement. The
22 panel discusses Niagara Mohawk's plans to deliver necessary investments in gas
23 infrastructure, including the replacement of leak prone pipe, programs to enhance

Testimony of Kenneth D. Daly

1 network reliability and support gas expansion, and investments to promote the safe
2 and reliable operation of our gas networks. The panel also discusses Niagara
3 Mohawk's O&M costs to provide gas distribution service to customers.

- 4 • The Gas Safety Panel consists of Ross Turrini, Robert De Marinis, Vice President –
5 Maintenance & Construction New York Gas, and Keri Sweet Zavaglia. The panel
6 presents the Company's gas safety programs, as well as its proposal on gas safety
7 performance metrics.
- 8 • Ann E. Bulkley of Concentric Advisors addresses the Company's cost of equity
9 capital.
- 10 • Stephen Caldwell, Director Regulatory Strategy & Integrated Analytics, addresses the
11 Company's overall cost of capital and capital structure.
- 12 • Maureen P. Heaphy, Vice President of U.S. Compensation, Benefits and Pensions,
13 describes National Grid's compensation and benefits program and our efforts to
14 control the costs of those programs.
- 15 • Keri Sweet Zavaglia addresses the Company's implementation of the
16 recommendations in the recent New York gas management audit, as well as the status
17 of the Commission's recent data and staffing audits.
- 18 • Dr. Kimbugewe Kateregga of Foster Associates LLC presents Niagara Mohawk's
19 electric depreciation study and proposed electric depreciation rates.
- 20 • Charles F. Willard, Director, Site Investigation and Remediation ("SIR"), discusses
21 Niagara Mohawk's SIR programs, its efforts to control and mitigate SIR expense and
22 its forecast SIR costs.

Testimony of Kenneth D. Daly

- 1 • The Shared Services Panel consists of Jody Allison, Vice President of Revenue Cycle
2 Management, Paula Leaverton, Manager of the Property Tax Department, Kathryn
3 Granger, Manager of Consumer Advocacy and Low Income, and Arlene Gans,
4 Director Customer Contact Centers, New York. The panel's testimony sets forth
5 proposals relating to property tax, uncollectible expense, customer service quality
6 metrics, and low income programs.
- 7 • The Electric Customer Panel consists of Carlos A. Nouel, Vice President, New
8 Energy Solutions, John F. Isberg, Vice President, Customer Solutions, and James M.
9 Molloy, Director of Revenue Requirements – New York. The panel presents Niagara
10 Mohawk's proposals on new products and services to enhance customer engagement
11 opportunities and advance the State's system modernization goals, current and
12 proposed demonstration projects to test new technologies, EAMs and platform
13 services revenues, investments associated with the Company's growing dynamic load
14 management programs, and modifications to the Company's electric energy
15 efficiency programs. In addition, the panel addresses the Company's proposal to
16 continue its successful economic development programs.
- 17 • The Gas Customer Panel consists of John F. Isberg and James M. Molloy. The panel
18 discusses Niagara Mohawk's proposal to test and deploy two non-pipeline
19 alternatives projects to create a more resilient and environmentally friendly gas
20 system. The panel also presents Niagara Mohawk's proposals on economic
21 development, outreach and education, gas conversion rebates, and energy efficiency.
- 22 • Joseph F. Gredder, Manager, Electric Forecasting and Analysis, presents the
23 Company's electric sales forecast.

Testimony of Kenneth D. Daly

- 1 • Theodore E. Poe, Jr., Manager, Gas Load Forecasting and Analysis, presents the
2 Company's gas sales forecast.
- 3 • The Electric Supply Panel consists of Margaret M. Janzen, Director, Wholesale
4 Electric Supply, and Christopher L. Meyer, Manager of New York Wholesale Electric
5 Supply. The panel discusses the Company's efforts to purchase electricity supplies
6 on a reliable, cost-efficient basis.
- 7 • Elizabeth D. Arangio, Director, Gas Supply Planning, discusses the Company's
8 efforts to purchase natural gas supplies on a reliable, cost-efficient basis.
- 9 • The Outdoor Lighting Panel consists of Melanie W. Littlejohn, Vice President of
10 Community and Customer Management, John E. Walter, Manager of Outdoor
11 Lighting – New York, and Pamela I. Echenique, Director of New York Pricing. The
12 panel describes several changes the Company proposes to improve the service it
13 provides to outdoor lighting customers and enable their transition to more advanced
14 outdoor lighting technology and equipment.
- 15 • The Advanced Metering and Infrastructure ("AMI") Panel consists of John O. Leana,
16 Director, Performance and Strategy New York, James M. Molloy and Pamela I.
17 Echenique, and discusses the Company's proposal to deploy electric AMI meters and
18 AMI compatible encoder receiver transmitters ("ERTs") for its gas meters that will
19 deliver customer, safety and operational benefits, and empower customers by
20 providing enhanced energy consumption data and more products and services for
21 managing their energy costs and usage.
- 22 • The Information Systems ("IS") Panel consists of Anuraag Bhargava, Senior Vice
23 President and Chief Information Officer, Daniel J. DeMauro, Director, IS Regulatory,

Testimony of Kenneth D. Daly

1 Mukund Ravipaty, Director, IS Risk and Security, and Aman Aneja, Director, IS
2 Business Relations. The panel's testimony describes major information systems
3 investments and initiatives during the Rate Year and Data Years, including
4 investments in cyber security.

- 5 • The Revenue Requirements Panel consists of David B. Doxsee, Vice President and
6 Chief Financial Officer – New York, Stephanie Briggs, Lead Specialist, Downstate
7 New York Revenue Requirements, and James M. Molloy. The panel's testimony sets
8 forth the electric and gas revenue requirements for the Rate Year, and describes
9 Niagara Mohawk's efforts to review the Historic Test Year costs to ensure they were
10 accurately charged.

- 11 • The Electric Rate Design Panel consists of Pamela I. Echenique, Howard S. Gorman
12 of HSG Group Inc., and Carol Teixeira, Manager, Electric Pricing New York. The
13 panel's testimony addresses Niagara Mohawk's marginal and embedded cost of
14 service studies, the revenue forecast, revenue allocation, rate design, and bill impacts
15 for electric customers.

- 16 • The Gas Rate Design Panel consists of Kellie I. Smith, Manager, Gas Pricing New
17 York, Pamela I. Echenique, and Howard Gorman. The panel's testimony addresses
18 the Company's marginal and embedded cost of service studies, the revenue forecast,
19 revenue allocation, rate design, and bill impacts.

21 **II. Background and Rate History**

22 **Q. Please describe Niagara Mohawk.**

Testimony of Kenneth D. Daly

1 A. Niagara Mohawk's electric transmission and distribution business serves approximately
2 1.6 million customers in more than 450 cities and towns across 24,000 square miles in
3 Upstate New York. The gas distribution business serves nearly 600,000 customers in the
4 areas of central, northern, and eastern Upstate New York utilizing more than 9,000 miles
5 of gas transmission and distribution main.

6
7 Niagara Mohawk is a provider of essential energy services to customers and a key
8 partner in the economic vitality of Upstate New York. The Company's distribution
9 networks power key economic segments including agribusiness, brewing, banking,
10 education, health care, high tech, manufacturing, medical research and development,
11 service industries, transportation, entertainment, and tourism. Across New York,
12 Niagara Mohawk is upgrading, expanding, and investing in energy delivery systems to
13 meet real economic growth.

14
15 While its first priority has always been the safe and reliable delivery of electricity and
16 natural gas, the Company has a long history of community engagement and a
17 demonstrated commitment to improving the quality of life in the communities we serve
18 through support for economic development, educational, and charitable programs. Since
19 2003, these programs have provided more than \$80 million that has helped create or
20 retain more than 45,000 jobs in the Company's service territory and supported more than
21 \$8.7 billion in private and public investment. Niagara Mohawk's economic development
22 grant programs provided \$11.3 million in grant assistance during fiscal year ("FY") 2016,
23 and over \$13.5 million in FY 2017 – the highest annual total in program history.

Testimony of Kenneth D. Daly

1 Groundbreaking emergency economic programs following Hurricanes Lee and Irene and
2 Superstorm Sandy helped 400 businesses rebuild and retain nearly 10,000 jobs.

3
4 **Q. Can you elaborate on ways in which Niagara Mohawk has helped to promote**
5 **economic development in the various regions of its service territory?**

6 A. Yes. Niagara Mohawk's economic development efforts have promoted economic
7 development in all of the geographic regions served by the Company:

8
9 *Western New York.* In Cattaraugus County, Niagara Mohawk financial incentives are
10 helping to foster growth in the Southern Tier through a new business incubator in Olean.
11 In Orleans County, a grant from the Company helped a large produce company in
12 Lyndonville add new technology to improve capabilities, reduce energy costs, and stay
13 competitive on a global scale. On the manufacturing front, \$1.3 million in National
14 Grid incentives helped a major manufacturer in Jamestown in southern Chautauqua
15 County reduce annual electricity use by 8.7 million kilowatt-hours – energy savings
16 equal to 6.6 million tons of carbon or more than 14,400 barrels of oil a year.

17
18 *Central New York.* In Oneida County, a \$250,000 Urban Corridor incentive helped a
19 business association revitalize a cherished Utica neighborhood, promoting growth while
20 preserving history. Across Onondaga, Oswego and Cortland counties, \$415,000 in
21 Niagara Mohawk incentives for lighting and boiler upgrades enabled Cortland and West
22 Genesee central school districts, Oswego County BOCES and SUNY Cortland to reduce
23 their energy use by a combined 3.5 million kilowatt-hours annually.

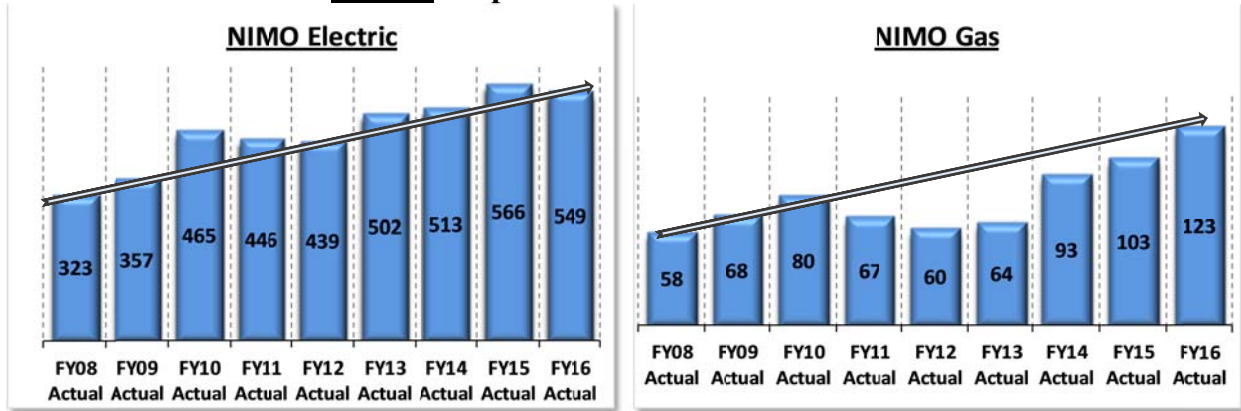
Testimony of Kenneth D. Daly

1
2 *Eastern New York.* In Schenectady, the Company is partnering on a massive
3 remediation and redevelopment effort at the former American Locomotive site, helping
4 to transform one of America's oldest brownfields into a waterfront tourism,
5 entertainment, commercial, and residential destination. In Clifton Park, Niagara
6 Mohawk is helping create the energy system of the future with an innovative program
7 that will improve system efficiency and resiliency while enabling customers to better
8 manage their energy consumption. The Company also supported an innovative biogas
9 technology upgrade that made the Gloversville-Johnstown wastewater treatment facility
10 the first in New York State to officially export power back into the electricity grid and
11 provide revenue for the towns. Energy efficiency incentives are helping local
12 companies stay competitive and add and retain jobs, boosting production while
13 achieving millions of kilowatt-hours in savings.

14
15 **Q. Please describe the Company's efforts to enhance the quality of service provided to**
16 **customers.**

17 A. Through our investments in infrastructure and commitment to deliver continuous
18 improvements in operations, the Company has significantly enhanced the quality of
19 service to customers. Over the past five years, Niagara Mohawk has invested more than
20 \$3 billion to modernize its Upstate New York electric gas and networks.

Table 1: Capital Investments FY 2008-2016



Since FY 2008, the Company has increased annual electric capital investment by 70 percent and annual gas capital investment by more than 110 percent. These investments are targeted at replacing aging infrastructure and building smarter networks that support customer and community priorities, including upgrades to promote growth and new technologies and system automation to enhance service quality. These investments, along with the efforts of the Company’s talented and dedicated work force, have enabled Niagara Mohawk to meet or exceed its electric reliability metrics since 2008, including eight consecutive years of achieving Customer Average Interruption Duration Index (“CAIDI”) and System Average Interruption Frequency Index (“SAIFI”) targets.

In response to increasingly severe weather events, the Company is prioritizing investment in storm hardening and resiliency, and incorporating lessons learned from significant weather events such as severe ice storms and summer tornadoes, Hurricanes Irene (2011) and Lee (2011), Superstorm Sandy (2012), and the Mohawk Valley flooding (2013). The Company’s excellent performance in electric storm restoration is illustrated by the following examples:

Testimony of Kenneth D. Daly

- Severe storms in June 2015 disrupted service to 60,000 customers. The Company was able to restore 99 percent of the affected customers within 24 hours.
- In October 2015, severe rains disrupted service to 64,000 customers. Again, the Company restored service to 99 percent of these customers in 24 hours.
- In August 2016, severe thunderstorms affected 100,000 customers; 90 percent were restored within 24 hours. This restoration effort involved more than 1,000 field workers removing trees, replacing poles, and repairing damage.

More recently, the Company experienced three severe storms over several weeks in 2017. On January 11, 2017, a winter storm with wet snow and high winds affected 85,000 customers, more than 90 percent of whom were restored within 11 hours. Then on March 1st, the Company quickly restored service to more than 112,500 electric customers interrupted by severe wind. And again on March 8th, we were recognized by customers and public officials for our response to wind storms that swept through western New York, delivering sustained wind gusts of 70 miles per hour and causing extensive damage to the electric system. The Company deployed a field force of more than 1,700 service, line and tree workers to restore power to the nearly 180,000 customers affected by the storm. Our crews replaced 300 broken poles and 80 damaged transformers, including more than 200 poles in the hardest hit Genesee region alone, and restored more than 96 percent of customers within 48 hours of the storm.

Testimony of Kenneth D. Daly

1 Niagara Mohawk's storm response efforts have received recognition within the industry.
2 The Company was awarded Edison Electric Institute's Outstanding Power Restoration
3 Efforts and Mutual Aid Support Awards in November 2012, December 2013, June 2015,
4 January 2016, and February 2016. The Company was also awarded North Atlantic
5 Mutual Assistance Group Key Contributor Awards in the Spring and Fall 2016. In
6 addition to supporting the Company's customers, Niagara Mohawk's crews have played a
7 vital role supporting electric and gas restoration activities during major storm events
8 impacting our sister utilities across New York.

9
10 With regard to the gas business, the Company has accelerated gas pipe replacement
11 across Niagara Mohawk's gas distribution system to remove leak prone facilities and
12 expanded its gas network to enable more customers and communities to benefit from
13 natural gas. Niagara Mohawk has established state of the art control systems, including
14 upgrades to emergency and outage management systems and enhanced system
15 automation. The Company has also reduced its backlog of system leaks, which will
16 enhance system performance and reduce methane emissions.

17
18 **Q. What has the Company done to help customers manage their energy usage and pay**
19 **their bills?**

20 A. Through its extensive energy efficiency programs, Niagara Mohawk helps consumers
21 manage their energy usage and take advantage of new energy technologies. Over the past
22 eight years, Niagara Mohawk's energy efficiency program processed more than three

Testimony of Kenneth D. Daly

1 million energy efficiency applications that have saved our customers approximately 1.7
2 billion kilowatt-hours of electricity and 36 million therms of natural gas.

3
4 Niagara Mohawk is also providing low-income assistance to more than 120,000
5 households annually, with programs and experts dedicated to delivering solutions for
6 those struggling to pay their energy bills. The Company's Consumer Advocacy team
7 serves more than 21,000 Upstate New York households through a comprehensive
8 approach that is designed to meet customers' and communities' individualized needs.
9 Demographic information is used to tailor low-income programs and services for
10 vulnerable customers across 24,000 square miles. The Company's low income
11 programs are focused on arrears management, outreach (approximately 300,000
12 outbound calls and 122,000 households assisted annually), energy efficiency programs,
13 discounts and bill credits, reconnect fee waivers, and fuel funds. The Company's
14 Customer Assistance Expos organize various assistance programs under one roof to help
15 customers secure needed resources in one day, while our grassroots Advocates in Action
16 reach out to the communities to identify vulnerable customers. Niagara Mohawk also
17 partners with low-income senior housing facilities, human service agencies, and
18 veterans organizations to direct customers to available assistance. Finally, National
19 Grid employees, who live and work in the communities served by the Company, spend
20 thousands of hours volunteering on behalf of numerous charitable causes and activities
21 across Upstate New York.

Testimony of Kenneth D. Daly

1 **Q. Has the Company developed any demonstration projects to enhance the customer**
2 **experience and advance the Commission’s efforts to implement Reforming the**
3 **Energy Vision (“REV”)?**

4 A. Niagara Mohawk stands as a partner with the Commission in implementing the REV
5 goals, which align with the Company’s efforts to modernize its electric system and
6 deliver more environmentally sustainable energy solutions and enhance services for
7 customers. A key aspect of that vision is testing new and innovative technologies. To
8 date, the Company has undertaken four demonstration projects consistent with the goals
9 of REV. The Buffalo Niagara Medical Campus demonstration project will test how the
10 Company, as the DSP provider, can integrate customer-owned energy resources to better
11 manage system demands. The Fruit Belt Neighborhood Solar demonstration project will
12 engage low-to-moderate income residential customers in the Fruit Belt neighborhood of
13 Buffalo, New York with solar and energy efficiency products and services. The Potsdam
14 Community Resiliency demonstration project is examining the feasibility of a community
15 microgrid to add resiliency to the electric infrastructure in the area. Finally, the Clifton
16 Park Smart Energy Solutions demonstration project involves the installation of AMI
17 meters for residents of Clifton Park, New York to test whether price signals, tools, and
18 innovative rate design concepts such as time-of-use rates will reduce electric demand.

19
20 Additionally, the Company has filed for approval for two additional demonstration
21 projects. The Smart Home Rate project, which is linked with the Clifton Park project,
22 involves providing residential voluntary time-of-use customers with voice recognition
23 technology that will allow them to control their home appliances through smart phone

Testimony of Kenneth D. Daly

1 applications and other technologies, enabling them to reduce their electric consumption
2 when prices are high. The Distributed Generation Interconnection demonstration project
3 seeks to test whether the Company's upfront investment in system upgrades to make the
4 electric system "DG-ready," combined with an innovative cost allocation methodology to
5 recover the cost of these upgrades from participating developers, will stimulate
6 interconnections in Upstate New York.

7
8 As described by the Electric Customer Panel, the Company is considering several
9 additional proposals to further animate markets and deliver the policy objectives of the
10 State and the Commission. These proposals include electric transportation, electric heat,
11 and an energy innovation center in Upstate New York. While the costs of these projects
12 are not included in the case in the interest of balancing investment with customer bill
13 impacts, the Company believes they respond to customer needs and support important
14 policy goals. Therefore, the Company welcomes the opportunity to discuss these
15 proposals with the parties to the case for inclusion in future proceedings or as part of a
16 multi-year settlement.

17
18 These projects will help to create a more efficient electric system and provide important
19 benefits to our customers. The Company looks forward to progressing the Commission's
20 REV initiative and working with Staff and stakeholders to embed the learning from
21 existing demonstration projects and develop further demonstration projects in the future.

22
23 **Q. Please provide the recent ratemaking history for Niagara Mohawk.**

Testimony of Kenneth D. Daly

A. The Company last filed for base rate increases in 2012. The joint proposal that was adopted by the Commission in 2013 provided for a three-year rate plan that commenced April 1, 2013. Under that rate plan, electric delivery service revenues were reduced by 8.7 percent in FY 2013 and increased by 2.8 percent in FY 2014 and again in FY 2015, while gas delivery service revenues were reduced by 6.7 percent in FY 2013 and increased by 4.9 percent in FY 2014 and again in FY 2015. In May 2016, the Commission issued an Order in Case 15-M-0744 that permitted Niagara Mohawk to utilize certain deferred credit balances to offset approved capital expenditures in FY 2017 and FY 2018.

Figure 2: Recent Ratemaking Timeline

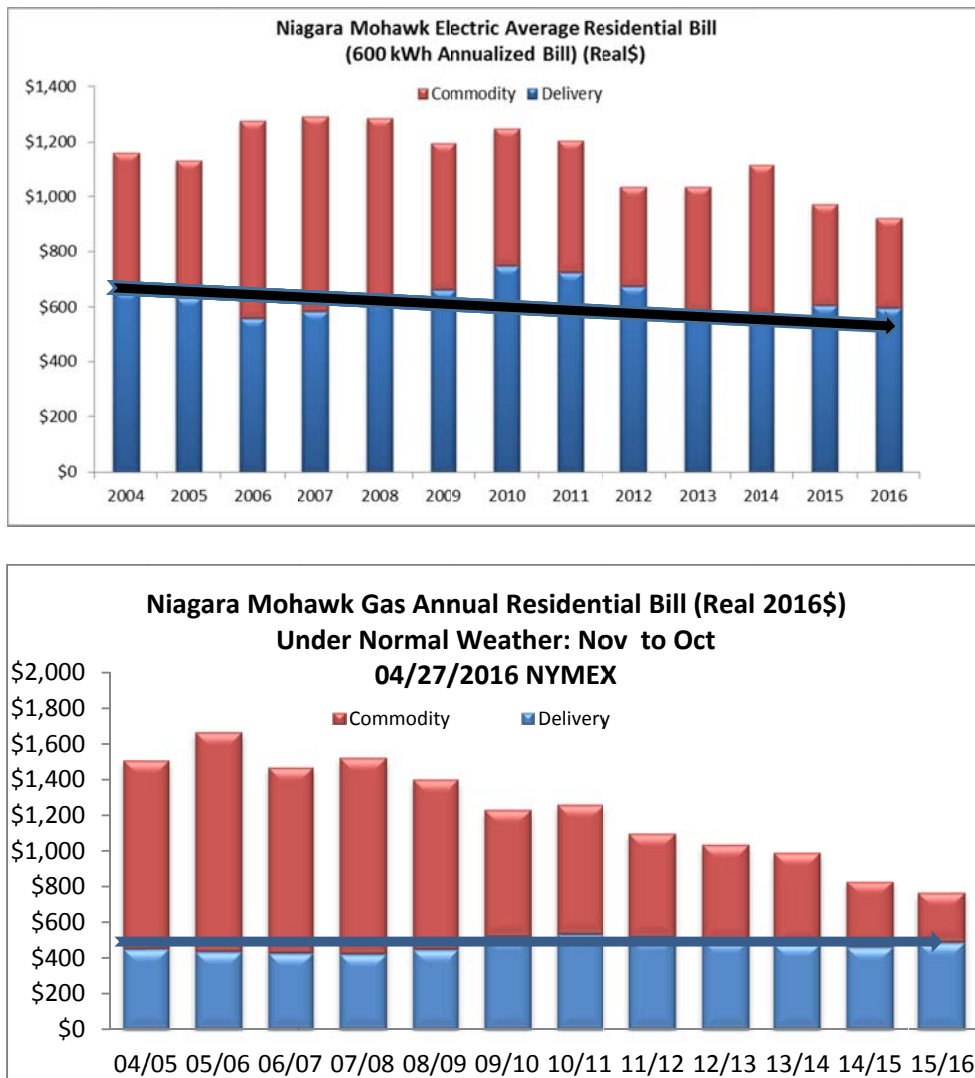
<u>January 2012</u>	<ul style="list-style-type: none">▪ Double digit delivery rate reductions for electric customers resulting from the expiration of competitive transition charges▪ Commission authorized recovery of incremental capital investments and deferral balances
<u>April 2013</u>	<ul style="list-style-type: none">▪ New three-year rate agreement timed to coincide with the expiration of a \$190 million annualized electric surcharge▪ Rate plan provides the opportunity to invest in infrastructure, continue important customer programs, and maintain rate stability for customers▪ Funded approximately \$1.6 billion in capital investment over the term of the rate plan
<u>May 2016</u>	<ul style="list-style-type: none">▪ Commission approves capital investment and financing petitions▪ Two year delivery rate freeze▪ Supported an additional \$1.3 billion investment in electricity and gas infrastructure investments through March 2018▪ Funding to accelerate leak prone pipe replacement to 98 miles over two years

As a result of the combination of the Company's efforts to contain cost increases and the support Niagara Mohawk has received from the Commission, customers have experienced an extended period of energy price stability – for both electricity and natural

Testimony of Kenneth D. Daly

gas. Adjusted for inflation, the combination of lower delivery and supply prices has resulted in total bills trending down over the last 12 years. Electricity bills are approximately 20 percent lower than they were in 2004, including a nine percent decrease in delivery rates and natural gas bills are 49 percent lower over that same period, including stable delivery rates. As shown in Figure 3, in real terms, the Company has provided more than a decade of price stability for residential electric and gas customers.

Figure 3: Average Residential Bills 2004 v. 2016



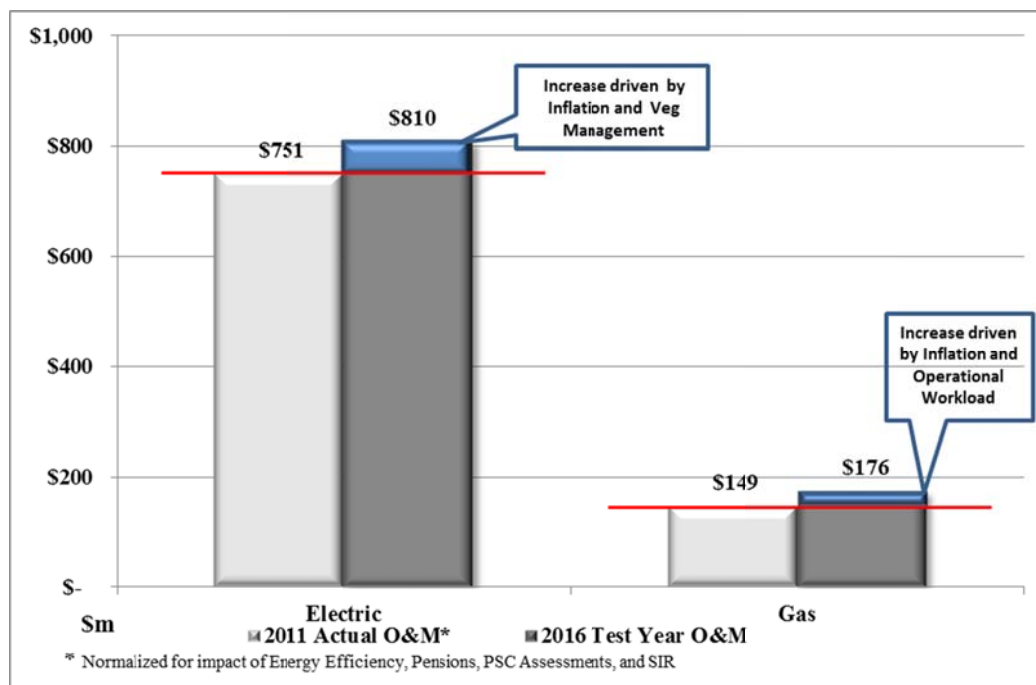
Testimony of Kenneth D. Daly

1 **Q. Please explain the Company's need for rate relief.**

2 A. Despite Niagara Mohawk's efforts to operate as efficiently as possible, the Company's
3 current rate allowances are inadequate to cover its cost of providing safe and reliable
4 service. Cost increases that are not reflected in rates have eroded returns in the
5 Company's electric and gas businesses. As mentioned earlier, the Company's capital
6 expenditures have increased very significantly as it has maintained and modernized its
7 gas and electric infrastructure even as customers' base delivery rates remained flat.
8 Increased capital expenditures and O&M are the principal drivers of the Company's
9 revenue deficiencies.

10
11 Table 1 (on page 18 above) illustrates the steep increases in capital investments the
12 Company has made between 2012 and 2016, with electric and gas capital expenditures up
13 more than 70 percent and 110 percent, respectively, over that period. Similarly, O&M
14 has increased significantly since 2012. A much larger capital program, added costs for
15 vegetation management, increased costs associated with customer programs, higher
16 materials and labor costs, increased funding for low income programs, as well as the
17 impact of general price inflation have driven the Company's O&M costs overall far
18 above the costs underlying its current rate plan. Figure 4 shows Niagara Mohawk's
19 increased O&M spending from 2011 to the Historic Test Year.

Figure 4: O&M Expenditures



III. Objectives for the Rate Filing

Q. What are the overall objectives of the Company's filings?

A. The Company has several objectives that are also important to our customers. The key objective is to adjust Niagara Mohawk's electric and gas base rates to recover the Company's costs of providing safe and reliable electric and gas service to its customers with a balanced proposal that mitigates the impact on customer bills. Achieving this critical objective will allow Niagara Mohawk to deliver on service priorities that align with the priorities of customers and the Commission, including executing the Company's electric and gas capital investment plans to enable it to continue providing safe and reliable service to customers, meeting all reliability performance standards and maintaining strong storm restoration performance. Establishing compensatory rates would also allow Niagara Mohawk to continue to respond to other interests of

Testimony of Kenneth D. Daly

1 customers, including helping them manage their energy usage and facilitating the
2 economic vitality of the communities that Niagara Mohawk serves.

3
4 Niagara Mohawk must adjust base rates to compensate the Company for the cost of
5 providing service, to fund necessary investment in infrastructure, to modernize networks
6 and enhance service to customers and to provide the Company's investors reasonable
7 returns. The opportunity for the Company to earn reasonable returns in both its gas and
8 electric businesses will allow it to attract, on favorable terms, the necessary capital to
9 finance operations, which will lower costs for customers in the long run. As described
10 by Company Witness Stephen Caldwell, the Company has a need to issue new long
11 term debt during the Rate Year and Data Years and plans to do so in a manner that will
12 obtain the best relative value for customers at the time the Company goes to the debt
13 market.

14
15 Niagara Mohawk needs a fair opportunity to earn a reasonable return on the equity it
16 will invest in its utility business. That opportunity, which can only be available from
17 compensatory rates, is a necessary outcome of this case.

18
19 In recognition of the impacts of this case on our customers, Niagara Mohawk undertook
20 significant outreach to customers and communities to educate them about the
21 Company's need for rate relief and to hear from them as to their priorities and
22 expectations. The Company found that its overall objectives align with those of

Testimony of Kenneth D. Daly

1 customers. In developing this case, Niagara Mohawk has reflected much of the
2 feedback we received from customers.

3
4 **Q. Please describe the efforts the Company's made to hear its customers' priorities**
5 **and what it learned.**

6 A. Niagara Mohawk had more than 250 outreach meetings, with customers, various state
7 agencies, local governments, school districts, hospitals, economic and community
8 partners and elected officials throughout its service territory. The outreach was
9 welcomed. We heard directly customers' expectations, what they believe the Company
10 does well and where it needs to improve.

11
12 Overwhelmingly, the top priorities are the reliability, safety and the affordability of
13 service. All constituents are very concerned about bill impacts. The Company heard
14 that it must do what it can to assist customers who struggle to pay their bills. A number
15 of these stakeholders suggested phasing in increases over multiple years to soften rate
16 impacts for customers. The Company heard praise for the hard work of its consumer
17 advocates, and was asked to add resources in this area.

18
19 Our largest commercial and industrial customers rely on our services to power their
20 businesses, so their number one priority is seeing the Company make the necessary
21 investments to deliver the highest standards in power quality and reliability, while at the
22 same time maintaining stable energy costs to help them stay competitive and retain jobs
23 in the region. These customers noted improved system performance as a result of our

Testimony of Kenneth D. Daly

1 investments and maintenance efforts. They are also looking for our assistance in
2 managing their energy usage and promoting sustainability through economic
3 development grants, energy efficiency programs and incentives.

4
5 Customers want to be able to communicate with the Company more easily and
6 effectively. While many praised the contacts they had with the Company, they seek
7 more direct communications on issues impacting their energy usage, including more
8 information on energy efficiency offerings, renewables, net metering, and available
9 energy incentives. The Company's educational partners indicated their strong support
10 for the Company's STEM (science, technology, engineering, and mathematics) grants,
11 mentoring, career panels, and training programs that are helping to develop the energy
12 employees of tomorrow and supporting the Company's workforce development needs.

13
14 The Company also heard from customers on various areas where improvement was
15 needed. The Company heard fair criticism and frustration on billing issues. Some
16 complained that the Company was slow to respond to new service requests, process
17 applications for incentives, and facilitate interconnections. Others complained about
18 interconnection costs and the need for customer contributions. Municipalities in the
19 Company's service territories have not been satisfied with the quality of outdoor
20 lighting services but are willing to work with Niagara Mohawk in this area.

21
22 This feedback from customers and constituents was very valuable and has guided
23 development of these filings.

Testimony of Kenneth D. Daly

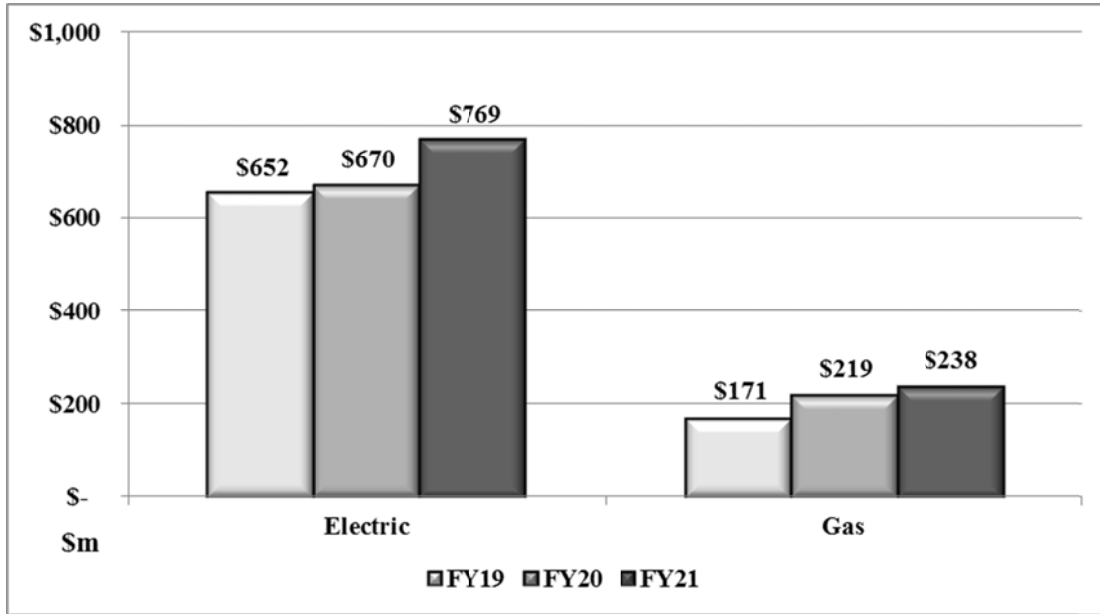
1 **A. Investing in Infrastructure and Developing Our Workforce**

2 **Q. Please provide an overview of the electric and gas infrastructure capital investment**
3 **plans that are reflected in the Company's filing.**

4 A. Although Niagara Mohawk has met its commitment to make significant infrastructure
5 investments in its electric and gas distribution systems, and continues to meet or exceed
6 its reliability performance targets, much work remains to be done on the system to
7 maintain safe and reliable service for customers. These filings present Niagara
8 Mohawk's gas and electric capital investment plans, which are designed to enable the
9 Company to continue to maintain safe and reliable service and meet customer
10 expectations.

11
12 The Company's capital spending programs are described in the testimony of the Electric
13 Infrastructure and Operations Panel and Gas Infrastructure and Operations Panel. The
14 Company proposes the following levels of capital spending for its electric and gas
15 businesses during the Rate Years and Data Years:

**Table 5: Proposed Capital Spending
(\$000)**



Q. Is the Company proposing to hire additional employees to support electric and gas operations?

A. Yes. To deliver our investment plans and to meet increased O&M workload, the Company needs an additional 141.5 and 77 full time equivalent positions for electric and gas, respectively, in the Rate Year. These additional positions are necessitated by the Company's increasing infrastructure investments and higher volume workload. In the coming months, National Grid will look to recruit and train employees needed to support capital and O&M programs, including jobs in gas engineering, project management, field operations, and quality assurance. These positions will provide the opportunity to develop coveted STEM work skills and experience, and offer the prospect of long term careers in the energy industry. As I discuss below, given the immediate need to hire highly skilled field and customer service employees and to plan

Testimony of Kenneth D. Daly

1 for the future retirements and transition of a deeply experienced workforce, National
2 Grid is playing a leadership role in the industry and launching new natural gas and
3 customer service academies and building on the Company's school partnerships and
4 STEM programs.

5
6 **Q. What is the Company doing to hire and train the next generation of utility workers?**

7 A. Both National Grid and the broader utility industry are facing a challenge as a result of
8 the aging demographic of its workforce. In the coming years, many of the most
9 experienced and skilled utility professionals will be eligible for retirement. Therefore,
10 National Grid must attract and retain the next generation of utility workers to support the
11 business and operate and maintain electric and gas infrastructure. As discussed in the
12 testimony of Company Witness Heaphy, National Grid has formed a Strategic Workforce
13 Planning Center of Excellence that will analyze our workforce demographics and future
14 business requirements and develop plans to address short and long-term staffing plans. In
15 an effort to ensure that National Grid will have access to qualified candidates in the
16 future, National Grid is partnering with vocational schools, community colleges and
17 veterans' associations to create a job "pipeline." In addition, National Grid is committed
18 to supporting STEM education, and we have developed a long term plan, known as
19 Engineering Our Future to attract students to STEM careers. National Grid is working
20 with educators and students, from kindergarten to college, to promote STEM education.
21 Specifically, National Grid has partnered with Erie, Onondaga and Hudson Valley
22 Community Colleges to develop programs that will provide access to future line workers.
23 To date, National Grid has hired more than 260 workers through these programs.

Testimony of Kenneth D. Daly

1 National Grid also plans to launch an “Upstate Gas Academy” that will build upon the
2 first-of-its-kind gas training program National Grid successfully launched with SUNY
3 Farmingdale in 2016.

4 5 **B. Electric System Investments and Outdoor Lighting**

6 **Q. Please describe the Company’s objectives with regard to its electric infrastructure**
7 **investments.**

8 A. The Company’s electric system is comprised of over 6,000 circuit miles of transmission
9 lines, more than 300 transmission substations, over 4,800 circuit miles of sub-
10 transmission lines, over 525 distribution substations, more than 700 large power
11 transformers, 36,000 circuit miles of primary distribution lines on over 1.2 million
12 distribution poles supplying over 400,000 line transformers, and many more assets. A
13 significant number of assets have been in service for 70 years or more, and exhibit
14 conditions consistent with their age.

15
16 The current need for system upgrades is not due to lack of recent investment. Over the
17 past five years, the Company exceeded, by more than \$150 million, its commitment in
18 the 2012 Rate Case to invest \$1.47 billion in Niagara Mohawk’s electric infrastructure.
19 These investments have enabled Niagara Mohawk to maintain reliable service to
20 customers. But significant electric infrastructure investment is still needed to satisfy
21 requirements established by various state and federal authorities, to address asset
22 condition issues and to ensure sufficient system capacity to meet our customers’ needs.
23 Through collaboration with customers, municipalities and other local organizations,

Testimony of Kenneth D. Daly

1 Niagara Mohawk is gaining information about where new, large customers may be sited
2 in the service territory for consideration in system planning.

3
4 Attention to these assets is essential to continued reliable operation of the system,
5 including: the Northeast Region Reinforcement Program, which will provide
6 reinforcement of the transmission system in the Saratoga and Glens Falls area and which
7 is necessitated by current thermal and voltage needs and area load growth related to the
8 proposed Luther Forest Technology Campus (\$128.1 million); the Gardenville rebuild
9 project will involve construction of a new 115kV breaker and substation at the
10 Gardenville substation site, which is an important station in the Western Division,
11 supplying approximately 750MVA of load to distribution stations in the region (\$24.8
12 million); the Lockport-Batavia 115 kV transmission circuit upgrade project will enhance
13 safety and system reliability by replacing 17.5 miles of transmission lines, as well as
14 several tower and wood pole structures (\$49.9 million); and the Sodeman Road
15 substation will add needed capacity to the Northeast Region and enable retirement of
16 poor performing facilities in the area (\$19 million).

17
18 A key feature of the Company's electric capital program, and one that is integral to the
19 Company's transition to the role of a DSP, is implementation of Advanced Metering
20 Infrastructure (AMI). AMI will provide customers with more information and greater
21 control over their energy usage and associated costs and the ability to choose new and
22 innovative solutions from authorized energy vendors. Further, AMI will enable the use
23 of metering data to support DSP planning functions such as demand modeling, load

Testimony of Kenneth D. Daly

1 forecasting, and capital investment planning. AMI will also serve as a foundation for
2 innovative rate design options. Without AMI, Niagara Mohawk would be challenged to
3 provide its customers with the expanded levels of service they expect. Recently, the
4 Commission approved AMI for Consolidated Edison and is considering AMI proposals
5 filed by other utilities. Niagara Mohawk customers expect and should be entitled to the
6 same level of service and benefits that AMI can deliver.

7
8 As described in the testimony of the AMI Panel, the Company's AMI proposal is
9 supported by a detailed business case and benefit-cost analysis. The business case
10 supports full electric AMI meter and gas ERT deployment over a five and a half year
11 program. In developing the AMI proposal, the Company was mindful of steps it could
12 take to mitigate bill impacts as well as deliver the benefits of AMI to customers sooner.
13 At the same time, it was important for the Company to allow time before meters were
14 deployed to engage stakeholders and ensure the development of a robust customer
15 engagement and outreach strategy. Therefore, the Company is proposing a phased
16 implementation strategy. Over an 18 month period, beginning in the middle of the Rate
17 Year and extending through Data Year 1 (twelve months ending March 31, 2020), the
18 Company will complete the design, procurement, and back-office system installation of
19 the project. In Data Year 2 (twelve months ending March 31, 2021), the Company will
20 begin a four year deployment of electric meters and gas ERTs. AMI is a foundational
21 component of the Company's grid modernization effort that will provide numerous
22 customer, societal, safety, and operational benefits to the Company and its customers.

Testimony of Kenneth D. Daly

1 **Q. Does the Company address non-wires alternatives in its filing?**

2 A. Yes. As described in the Electric Infrastructure and Operations Panel testimony, the
3 Company has developed an improved process to integrate non-wires alternatives
4 (“NWAs”) into system planning to promote more cost-effective and environmentally
5 sustainable solutions for addressing system needs. Through this process, the Company
6 initially identifies areas where NWAs may potentially benefit the system and then assess
7 the feasibility of deploying NWAs and design options. Niagara Mohawk has identified
8 more than twenty areas/projects that have passed the initial screen and will be evaluated
9 for viable NWA solution options. The Company issued a request for proposal (“RFP”)
10 soliciting NWAs to address a system need identified in the area of Baldwinsville, New
11 York. RFPs relating to other areas/projects will be issued this coming summer. To
12 promote innovation in this area, the Company describes a proposed incentive mechanism
13 that would allow it to share in any customer benefits realized by displacing traditional
14 wires solutions with NWAs while ensuring that the majority of savings will benefit our
15 customers.

16
17 **Q. Will the investments reflected in the Company’s capital program help achieve the**
18 **goals of the Commission’s REV proceeding?**

19 A. Yes. The Company’s efforts to create a more modern, resilient electric system fully align
20 with the goals of REV. In Niagara Mohawk’s initial Distributed System Implementation
21 Plan (“DSIP”) filed on June 30, 2016 in Case 14-M-0101, the Company set forth a self-
22 assessment of actions it was already taking to modernize its infrastructure, as well as the
23 incremental investments needed for its evolution to a DSP provider. Notwithstanding the

Testimony of Kenneth D. Daly

1 REV proceeding, many of these investments would have been made by the Company to
2 modernize its system and address the expansion of DER in the Company's service
3 territory.

4
5 **Q. What is the Company's proposal to enhance its outdoor lighting business?**

6 A. As discussed by the Outdoor Lighting and the Electric Rate Design Panels, the
7 Company is proposing to update its outdoor lighting pricing provision, to implement
8 revenue decoupling for its outdoor lighting services, and to take a series of proactive
9 steps to enable municipal conversions to light emitting diode ("LED") luminaries. The
10 Company is also embarking on two pilot projects aimed at evaluating different outdoor
11 lighting technologies, and stepping up its efforts to work together with municipalities to
12 ensure the safe attachment of powered, non-lighting equipment to the Company's
13 facilities, as well as working with municipalities interested in acquiring the outdoor
14 lighting assets that currently serve them. Additionally, as described by the Electric
15 Customer Panel, the Company is proposing to implement an LED street lighting energy
16 efficiency program and undertake a "Smart City" street lighting demonstration project
17 in partnership with the City of Schenectady.

18
19 **C. Gas Investments and Operations**

20 **Q. Please explain the Company's objectives and proposals with respect to gas**
21 **infrastructure investment.**

Testimony of Kenneth D. Daly

A. The primary objective of the Company's gas capital investment program is maintaining safe and reliable delivery service, continuing the accelerated removal of leak prone pipe and reinforcing the gas distribution system to maintain reliability and enable growth.

Niagara Mohawk's gas capital program will require capital expenditures in the Rate Year and Data Years as follows:

Table 6: Gas Capital Investments FY 2019-2021

(\$000)	FY 2019	FY 2020	FY 2021
Growth	39,184	42,058	47,949
Mandated	103,307	120,112	130,985
Reliability	24,360	52,733	54,183
Non-Infrastructure	1,758	1,807	1,850
Common	2,887	2,618	2,618
Total	171,496	219,467	237,703

Niagara Mohawk shares the Commission's objective of removing leak prone pipe to maximize the safety of New York's gas distribution networks. Accordingly, the Company's filing maintains the current aggressive pace of leak prone pipe replacement, replacing on average at least 50 miles of leak prone pipe each year, and proposes limited incentives to encourage additional main replacements and productivity improvements to reduce the costs of this program.

The Company's gas capital investment program includes a number of other projects that will enhance the safety and reliability of its gas distribution system including:

Testimony of Kenneth D. Daly

- 1 • Integrity Management Program investments that will enhance the Company's
2 ability to identify and address potential issues affecting the Company's facilities
3 before they become safety or performance issues
- 4 • Construction of the Albany Loop Closure project, which involves the installation
5 of 38,000 feet of 16-inch transmission main from the south end of the Albany
6 Loop in Glenmont, New York to the northeast end in Troy, New York. This
7 project will reduce the possibility of curtailments that might otherwise be
8 necessary if Dominion Transmission Inc. ("DTI") were to curtail firm service to
9 Niagara Mohawk at its Troy Gate Station. This project will also increase supply
10 flexibility and reliability in the eastern portion of Niagara Mohawk's service
11 territory and support future growth.
- 12 • The commencement of the replacement of 15,000 feet of eight-inch main on
13 Pipeline 34 located in Oswego, New York. The pipeline was installed using a
14 "lap welding" technique that is outdated. This project will significantly enhance
15 the reliability of Pipeline 34.

16
17 **Q. What does the Company propose with respect to leak repairs?**

18 A. Since its last rate filing, Niagara Mohawk has dedicated significant resources to
19 improving its management of total leaks - having reduced its total backlog by more than
20 700 leaks. This was accomplished despite several years of harsh winter weather
21 conditions and increasing leak rates on aging leak prone facilities that contributed to
22 additional system leaks. Going forward, Niagara Mohawk proposes to maintain a leak
23 backlog of no more than 1,000 non-hazardous leaks. While these leaks do not present

Testimony of Kenneth D. Daly

1 safety risks, maintaining a relatively low backlog of non-hazardous leaks helps system
2 performance and minimizes methane emissions. The Company also proposes to use the
3 Gas Safety and Reliability Surcharge to fund the repair of additional leaks below the
4 1,000 leak target, capped at 250 additional leaks per year. At the same time, Niagara
5 Mohawk is proposing targets for reducing its hazardous leaks that will require it to
6 improve on its strong performance in this area to ensure that the non-hazardous leak
7 metrics do not divert resources from repairing hazardous leaks.

8
9 **Q. What is the Company's proposal with respect to gas safety and compliance?**

10 A. Niagara Mohawk is committed to improving its compliance performance and is
11 undertaking a series of measures to improve in this area. The Company is implementing
12 a process safety program that adopts the American Petroleum Institute's recommended
13 pipeline safety management system standards (Recommended Practice 1173). These
14 standards provide a framework for identifying hazards, controlling potential risks and
15 addressing safety and maintenance requirements throughout a pipeline's life cycle to
16 reduce the likelihood of safety incidents. The Company has also engaged a pipeline
17 safety expert to conduct an independent assessment of the Company's gas operations to
18 identify any compliance gaps and develop remediation plans.

19
20 Longer term, systems and automation are required to improve performance, particularly
21 on the records audits. The Company is in the process of delivering these enhancements
22 through its work to implement Gas Business Enablement (discussed below).

Testimony of Kenneth D. Daly

1 The Company is also implementing enhancements to its gas safety outreach program to
2 better educate the public on the importance of recognizing and reporting gas odors,
3 improving training and coordination with first responders, and deploying additional
4 damage prevention resources to protect underground facilities. Finally, to advance
5 residential methane detection technology, the Company is proposing to deploy residential
6 methane detectors to customers in the service territory.

7
8 With regard to its gas safety performance metrics, the Company proposes to modify the
9 metrics to provide more stringent performance targets in areas such as damage prevention
10 and leak management and to adjust the safety violations metric to focus more attention on
11 addressing compliance deficiencies going forward.

12
13 **Q. Please describe the Gas Business Enablement (“GBE”) Program and the benefits**
14 **for the Company’s upstate gas business and customers.**

15 A. Niagara Mohawk’s gas business is focused on maintaining its strong safety and
16 reliability performance, delivering an expanding capital program, improving
17 compliance, meeting growing demand for gas service, and supporting evolving
18 customer expectations. It is critical that we have in place the people, processes, and
19 systems capable of supporting these priorities. But the Company’s current systems are
20 significantly older than industry average, and we are over reliant on dated technology
21 and paper records that are not meeting our business requirements. GBE is a
22 comprehensive program to update our gas business processes and systems with the goal
23 of reducing operational risk, enhancing performance, and creating a platform to support

Testimony of Kenneth D. Daly

1 future growth and customer demands. Specifically, GBE will deploy industry standard
2 asset management, work management, and geospatial information systems to better
3 manage our gas assets, work records, and system data. These systems will improve our
4 ability to plan and execute capital investments, promote safety and compliance, and lead
5 to better utilization of workforce and contractor resources. The program also involves a
6 new data interface that will provide our employees in the field with real time access to
7 maps, records, procedures, and other data. Enhanced dispatching and scheduling
8 capabilities will improve customer service, and customers will also have access to
9 additional information on the status of service appointments and other work. Work is
10 already underway to deliver this important project, and the first components are
11 expected to go in service in 2018. The Gas Infrastructure and Operations Panel
12 discusses the GBE program initiatives, benefits, and costs in more detail.

13 14 **D. Information Systems Investments**

15 **Q. What is the Company's proposal to upgrade its information systems?**

16 A. Modern energy networks rely on state-of-the-art information systems to monitor,
17 manage, and optimize system performance, integrate renewables and other distributed
18 resources, and stay ahead of emerging cyber-security threats. Many of National Grid's
19 legacy information systems, however, are at or near the end of their useful lives and rely
20 on outdated technology that is insufficient to support these evolving business
21 requirements. Aged infrastructure is more prone to outages and extended down time,
22 which can negatively impact network reliability and resiliency. The current systems

Testimony of Kenneth D. Daly

1 also lack the flexibility to incorporate new technologies that will serve customer
2 expectations or drive performance improvements and efficiencies in the future.

3
4 To address these IS challenges, National Grid has designed an IS Technology
5 Modernization Program to (i) upgrade information system infrastructure to address
6 reliability and ensure business continuity, and (ii) modernize critical applications to
7 deliver new capabilities. The Company's share of these investments is approximately
8 \$13 million over the Rate Year and Data Years, which is a significant, but necessary,
9 investment to develop IS infrastructure that is capable of supporting our current and
10 future business needs. This program will improve network capabilities, enable cloud
11 and mobile technologies, improve cyber-security, and enhance the Company's ability to
12 adopt future upgrades and new applications. These systems investments will also
13 enable key customer and operations programs, including the Company's Gas Businesses
14 Enablement, low income, and customer service programs.

15
16 **Q. Please describe the Company's strategy for delivering the IS investments presented**
17 **in this case.**

18 A. In 2012, National Grid implemented a new IS delivery model that utilizes external
19 partners to perform various IS functions. Since that time, our business demands have
20 evolved and now require increasingly sophisticated IS capabilities to support grid
21 modernization, dynamic networks, and distributed platforms, digital customer
22 applications, advanced data analytics, and workforce efficiency tools (*e.g.*, field data
23 capture devices). To provide this support, National Grid is refining its IS delivery

Testimony of Kenneth D. Daly

1 model to incorporate lessons learned through experience working with our vendors,
2 address areas of poor performance, and meet evolving business requirements. We will
3 continue to rely on external vendors, which is appropriate in the extremely fast paced
4 evolving IS world to enable efficient delivery, but will develop greater in-house
5 capacity to be able to better manage and leverage these external resources and assure
6 that the specific IS needs of the Company and its customers are clearly understood,
7 communicated, and addressed.

8
9 The Information Systems Panel, Gas Infrastructure and Operations Panel, Electric
10 Infrastructure and Operations Panel, Revenue Requirements Panel, and Company
11 Witness Maureen Heaphy discuss in more detail the Company's investments in
12 information systems and strategy to deliver on these investments.

13
14 **Q. Please discuss the Company's approach to addressing cybersecurity concerns and**
15 **how these efforts are reflected in the filing.**

16 **A.** Enhanced cyber security is one of the Company's top priorities. With the grid becoming
17 more interactive by the day, and with increasing amounts of data being exchanged
18 between the Company, customers, and third-parties, incremental investment in cyber
19 security is required to mitigate risk and ensure reliability. As described by the
20 Information Systems Panel, the Company is preparing to invest approximately \$7.5
21 million over the next three years to enhance cyber security. The investment will protect
22 National Grid's energy networks, information systems, and company/customer data from
23 the ever increasing threat of cyber intrusions.

1 **E. Enhancing the Customer Experience**

2 **Q. Please describe the Company's proposal to enhance the customer experience.**

3 A. Everything Niagara Mohawk does begins and ends with the customer – and these rate
4 filings are no different. These rate filings are designed to facilitate various investments
5 and programs that are needed to enhance customers' experience. For example, the
6 Company proposes to improve call center operations by utilizing new technology to
7 increase the capabilities of remote customer agents and by fully utilizing the resources of
8 National Grid's New York contact centers to improve service levels. Niagara Mohawk is
9 also upgrading its customer call center technology, including a new interactive voice
10 response system, to better manage customer calls.

11
12 **Q. Please provide an overview of the Company's proposed products, services, and new**
13 **technologies to engage customers and promote new energy solutions.**

14 A. As discussed by the Electric Customer Panel, Niagara Mohawk developed a suite of new
15 products and services to increase customer engagement and enable the creation of an
16 animated energy marketplace in Upstate New York. These include new platforms that
17 will provide customers with expanded access to energy marketplaces and tools to help
18 them better assess their energy use and make informed decisions to lower their energy
19 bills. The proposals also include projects to test and deploy new technologies to create a
20 smarter and cleaner energy distribution network.

Testimony of Kenneth D. Daly

1 The Company is also investing in applications to make system data available to
2 developers and third-parties to facilitate the increased integration of DER. These
3 investments are described by the Electric Infrastructure and Operations Panel.

4
5 For gas, Niagara Mohawk is proposing to test and deploy alternatives to traditional gas
6 main construction projects as potentially cost effective and environmentally sustainable
7 solutions for addressing customer demands. As described by the Gas Customer Panel,
8 this work includes projects designed to address system constraints in the eastern portion
9 of the service territory.

10
11 Beyond these efforts, the Company sees other opportunities to advance the State's clean
12 energy policies. While these projects, such as an electric transportation initiative, are not
13 included in the revenue requirements, we believe that they provide important benefits to
14 customers and our communities and are eager to explore them with parties during these
15 proceedings. These efforts are described by the Electric Customer Panel.

16
17 **Q. Please explain the Company's low income proposals.**

18 A. Niagara Mohawk recognizes that many customers struggle to make ends meet. The
19 Shared Services Panel presents the Company's proposal to enhance its low income
20 program and provide additional assistance to our customers most in need. Specifically,
21 the Company is proposing to implement the new regulatory policy framework for
22 addressing low income customer needs recently adopted by the Commission through a
23 new Energy Affordability Program that will provide fixed low income discounts of

Testimony of Kenneth D. Daly

1 varying levels based on needs. This expanded program has the potential to provide an
2 unprecedented \$70 million in low income benefits. The Company anticipates the new
3 program will also significantly increase - by as many as 55,000 customers – participation
4 in low income assistance programs.

5
6 While the Company has already expanded its efforts to reach out to low income
7 customers to encourage greater enrollment in the Energy Affordability Program, the
8 Company is proposing a new Energy Affordability Engagement Initiative designed to
9 engage low income customers and increase awareness and interest in energy affordability
10 programs, energy efficiency and gas safety. The Company is also proposing programs
11 that will enable low income customers to save money on their heating bills by converting
12 to natural gas. These programs will reduce or eliminate the upfront conversions costs by
13 providing rebates for high efficiency gas heating equipment and connecting qualifying
14 customers at no cost. The Shared Services Panel and Gas Customer Panel discuss the
15 Company's low income proposals in greater detail and explain how the Company
16 proposes to recover the costs of its expanded low income program.

17
18 **Q. Please explain the Company's economic development proposals.**

19 **A.** The Company administers a portfolio of incentive programs that support New York's
20 economic development objectives. These programs include electric delivery discount
21 programs, such as the Empire Zone Rider and Excelsior Jobs Program that provide
22 millions of dollars in energy discounts to customers expanding business and create jobs
23 in Upstate New York, as well as grant programs that are designed to promote economic

Testimony of Kenneth D. Daly

1 development and urban revitalization in the Company's service territory. The Company
2 supports 17 active electric grant programs that help customers manage energy issues to
3 remain competitive; promote sustainable "smart" growth by redeveloping vacant
4 buildings and brownfield sites; and facilitate regional growth through the development
5 and deployment of renewable energy technologies. Niagara Mohawk also partners with
6 state, regional, and local economic development organizations to market the Upstate New
7 York region to businesses looking to expand or relocate.

8
9 The Company proposes to continue its economic development discounts and grant
10 programs at their current levels. Collectively, these programs will help offset customer
11 costs for natural gas infrastructure upgrades to accommodate business expansion and
12 economic growth, conversion to gas from an alternate fuel or new construction, and
13 promote regional economic growth through the development, demonstration and
14 deployment of new sustainable gas technologies.

15 16 **V. Niagara Mohawk's Electric and Gas Rate Filing**

17 **Q. Please address the review and presentation of the cost of service data in the**
18 **Historic Test Year and the Rate Year.**

19 A. The Revenue Requirements Panel describes how the cost data included in the
20 Company's filing was reviewed and prepared. To facilitate Staff's review of Historic
21 Test Year costs, National Grid engaged PricewaterhouseCoopers ("PwC") to review the
22 accounting for costs charged to the Company in the Historic Test Year. This detailed
23 review included an assessment of various service company and operating company costs

Testimony of Kenneth D. Daly

1 in the Historic Test Year. PwC's review was focused on verifying that the reviewed
2 Historic Test Year costs were charged correctly in accordance with National Grid's cost
3 allocation methodologies, and were appropriate to include in Niagara Mohawk's cost of
4 service. In addition, the Historic Test Year and the forecast Rate Year underwent
5 significant internal reviews. Together, these internal and external reviews should
6 facilitate Staff's timely audit of costs included in Niagara Mohawk's gas and electric
7 revenue requirements.

8
9 **Q. Please provide an overview of National Grid's efforts to reduce costs through**
10 **efficiency initiatives?**

11 A. As discussed in the testimony of the Revenue Requirements Panel, the Company
12 revenue requirements reflect the impact of various efforts to achieve cost efficiencies,
13 all without compromising the ability to provide safe and reliable service. These efforts
14 will pay significant dividends for Niagara Mohawk's customers.

15
16 Of the \$30 million of cost reductions from initiatives to be implemented before the start
17 of the Rate Year, approximately \$8.5 million are allocable to Niagara Mohawk and 100
18 percent of these cost reductions are reflected in the Company's Rate Year labor forecast
19 and non-labor savings adjustment. The revenue requirement also reflects savings
20 realized through National Grid's Performance Excellence (PEX) strategy, which
21 combines end-to-end process work with the development of enhanced leadership
22 qualities and business capabilities. In addition to the sustainable savings from various
23 initiatives that are reflected in the Historic Test Year, we are proposing a productivity

Testimony of Kenneth D. Daly

1 factor of one percent of payroll and payroll taxes be applied in the Rate Year and Data
2 Years to encourage the Company to continue to seek cost efficiency measures.

3
4 The Revenue Requirements Panel presents the cost data for the two additional data
5 years that we hope will facilitate a multi-year rate settlement. This panel also addresses
6 cost tracker and recovery mechanisms to protect both the Company and our customers
7 from costs that deviate from the rate allowances.

8
9 **Q. What rate of return on equity and capital structure does the Company propose?**

10 A. Niagara Mohawk is proposing a return on equity of 9.79 percent for the Rate Year and a
11 capital structure with a 48 percent equity component. For a multi-year rate plan, the
12 Company proposes that its return on equity reflect a premium of 50 basis points. While
13 the Company's actual capital structure is higher than 48 percent equity, the Company is
14 proposing a 48 percent equity structure consistent with the Commission's recent
15 precedent, as discussed in the testimony of Company Witnesses Ann E. Bulkley of
16 Concentric Advisors and Stephen Caldwell.

17
18 The interests of both Niagara Mohawk and its customers will be served if the results of
19 these rate filings are rates that fully compensate the Company's cost of providing service
20 to customers and afford the Company a reasonable opportunity to earn its allowed returns
21 on equity that is commensurate with enterprises of similar risk. The Company's ability to
22 retain access to capital markets on terms favorable to our customers will be directly
23 affected by the rates authorized by the Commission in this proceeding.

Testimony of Kenneth D. Daly

1 Investors use the return on equity as a key benchmark in assessing investment
2 opportunities in public utilities. A return on equity that is below what investors believe
3 they can earn on investments in companies with similar risk would impair our ability to
4 attract capital, both debt and equity, on reasonable terms. A downgrade could impact the
5 Company's credit quality and raise costs for customers as the cost of borrowing
6 increases.

7
8 **Q. Please discuss the earnings adjustment mechanisms (EAMs) proposed for the**
9 **electric business.**

10 A. In this filing, Niagara Mohawk proposes a number of investments, products, and services
11 that are interrelated. These investments, products, and services are presented as a
12 portfolio designed to further build on existing Company and industry momentum, and in
13 doing so, deliver outcomes that benefit customers while at the same time achieving the
14 Commission's objectives of animating the energy market and creating system-wide
15 efficiencies.

16
17 To emphasize the value of these outcomes for customers the Company has included
18 EAMs to incent performance in the areas of system efficiency, energy efficiency,
19 interconnections, and customer engagement. Achievement of the ambitious targets set
20 out in the EAMs will require the Company not only to leverage the programs and
21 services that will be created through the investments contained in the filing, but to go
22 beyond what is known today and seek innovative new solutions to these challenges. The
23 Electric Customer Panel describes the proposed EAMs.

Testimony of Kenneth D. Daly

1 **Q. What are the rate impacts of the Company's filing?**

2 A. Because the Company's revenue deficiencies are significant, the rate impacts are
3 significant as well. Table 7 shows the rate impact of the Company's filings on a typical
4 residential heating customer based on a comparison of total bills in the Rate Year with
5 and without the proposed increase.

6 **Table 7: Residential Customer Bill Impacts – One Year Case**

Average Usage Customer	Monthly Usage	Delivery Increase	Total Bill Increase %
Electric: SC-1	600 kWh	\$11.23	13.94% (21.78% delivery portion)
Gas: SC-1	77 Therms	\$10.50	14.91% (24.81% delivery portion)

7
8 As discussed in the testimony of our Electric Rate Design and Gas Rate Design Panels,
9 the Company's proposal results in total bill increases for average usage residential
10 electric customers and gas customers of 13.94 percent and 14.91 percent, respectively,
11 before applying approximately one third of the current net electric and gas deferral
12 balances to mitigate the proposed rate increases.

13
14 The Revenue Requirements Panel and the Electric and Gas Rate Design Panels discuss
15 and illustrate how Niagara Mohawk's rate increases could be spread over a three-year
16 rate plan. The testimony of these panels demonstrates that distributing the revenue
17 increases over multiple years, and applying the Company's deferral account balances,

Testimony of Kenneth D. Daly

1 would help to mitigate the impacts on electric and gas customers by reducing, on average,
2 the delivery bill increase across all customer classes to approximately ten percent a year
3 over the term of the rate plan. Niagara Mohawk looks forward to working with Staff and
4 the other parties to arrive at a multi-year rate plan that permits recovery of the
5 Company's cost of service and mitigates the impacts for our customers.

6 7 **V. Summary**

8 **Q. Please summarize your testimony.**

9 A. Our more than 2.2 million Upstate New York electricity and natural gas customers rely
10 on Niagara Mohawk to deliver the energy that enables virtually every aspect of their daily
11 lives. It is a responsibility the Company takes very seriously. The Company has
12 developed a comprehensive rate proposal that addresses our customers' energy needs
13 today and lays the groundwork for the dynamic networks that will serve us tomorrow.
14 The Company's challenge is to strike a balance that allows us to deliver on the shared
15 priorities of safety, reliability and affordability, while continuing to make smart
16 infrastructure investments, integrate renewable energy into the grid, implement new
17 technologies that offer more options and control, and advance economic growth and
18 energy efficiency across Upstate New York.

19
20 Niagara Mohawk has listened to its customers, Staff and other stakeholders and their
21 input informed the development of this case. These filings propose necessary investment
22 in the upstate distribution systems to make sure customers can count on the Company to
23 power their homes and businesses, to comply with existing and emerging safety

Testimony of Kenneth D. Daly

1 regulations, to make the gas and electric networks more resilient to extreme weather
2 events, and to enable growth.

3
4 As the energy provider to over two million customers in New York, Niagara Mohawk is
5 investing in our communities and advancing clean energy solutions that further our
6 commitment to environmental stewardship. We are proposing increased financial
7 assistance and conversion rebates to our low income customers. We propose economic
8 development funding to promote business expansion that will create jobs and to promote
9 clean energy technology. We are working with educational partners to promote STEM
10 skills and creating educational opportunities for the workforce of the future to learn the
11 critical math, engineering and customer service skills needed in the energy industry. We
12 present demonstration programs that would advance energy technologies and a
13 commercial demand response program that would credit customers for reducing energy
14 usage during peak periods.

15
16 The energy future will be very different than today, but one thing that will never change
17 is Niagara Mohawk's commitment to delivering safe, reliable, affordable and clean
18 energy. With the input and partnership of all stakeholders, the Company will invest,
19 provide greater value and deliver an energy future that is smarter, cleaner, and stronger.

20
21 **Q. Does that conclude your testimony?**

22 **A.** Yes.

Testimony of
Keri Sweet Zavaglia

Before the Public Service Commission

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID

Direct Testimony

of

Keri Sweet Zavaglia

Dated: April 28, 2017

Testimony of Keri Sweet Zavaglia

Table of Contents

I.	Introduction and Qualifications	1
II.	Purpose of the Testimony	2
III.	Management Audit Implementation Plan	4
IV.	Management Audit Implementation Costs	11
V.	Data and Staffing Audits.....	13

Testimony of Keri Sweet Zavaglia

1 **I. Introduction and Qualifications**

2 **Q. Please state your name and business address.**

3 A. My name is Keri Sweet Zavaglia. My business address is 300 Erie
4 Boulevard West, Syracuse, New York 13202.

5
6 **Q. By whom are you employed and in what capacity?**

7 A. I am employed by National Grid USA Service Company, Inc., a subsidiary
8 of National Grid USA (“National Grid”), as Vice President, New York
9 Performance & Strategy. I am responsible for the performance
10 management of National Grid’s New York businesses, including Niagara
11 Mohawk Power Corporation d/b/a National Grid (“Niagara Mohawk” or
12 the “Company”), and executing their business strategy.

13

14 **Q. Please describe your educational background and business
15 experience.**

16 A. I received a Bachelor of Arts in Journalism, Public Relations and
17 Advertising from Temple University in 1999. I received a Juris Doctorate
18 from Temple University Beasley School of Law in 2002 and served as an
19 Assistant District Attorney in Philadelphia, Pennsylvania for more than
20 three years. I have worked for National Grid for 11 years, primarily as an
21 attorney in various roles in the New York Regulatory Legal group. From

Testimony of Keri Sweet Zavaglia

1 January 2015 through March 2017, I served as the Acting Vice President
2 of Gas Operations for Upstate New York, where I oversaw the
3 approximately 300 employees responsible for maintenance, construction
4 and damage prevention. In the beginning of 2016, I assumed my current
5 role.

6
7 **Q. Have you previously testified before the Commission?**

8 A. Yes. I testified on behalf of KeySpan Gas East Corporation d/b/a National
9 Grid (“KEDLI”) and The Brooklyn Union Gas Company d/b/a National
10 Grid NY (“KEDNY”) in Cases 16-G-0058 and 16-G-0059 (collectively,
11 the “2016 KEDLI and KEDNY Rate Cases”).

II. Purpose of the Testimony

12
13
14 **Q. What is the purpose of your testimony?**

15 A. The purpose of my testimony is to describe the Company’s progress in
16 implementing the recommendations from the Comprehensive
17 Management and Operations Audit (the “Management Audit”) of National
18 Grid’s New York gas business (Case 13-G-0009), conducted by NorthStar
19 Consulting Group (“NorthStar”). The testimony also discusses the status
20 of two other audits: Operations Audit of the Accuracy of New York State
21 Utilities’ Self-Reported Data in Case 13-M-0314 (“Data Audit”); and Case

Testimony of Keri Sweet Zavaglia

1 13-M-0449, Focused Operations Audit of Major Utility Internal Staffing
2 Levels and Use of Contractors for Selected Core Utility Functions at
3 Major New York Energy Utilities (“Staffing Audit”).
4

5 **Q. Are you sponsoring any exhibits through your testimony?**

6 A. Yes. I sponsor three exhibits that were prepared under my direction and
7 supervision:

- 8 • Exhibit ____ (KSZ-1) is a chart summarizing (i) the key
9 implementation plan deliverables and (ii) NorthStar’s cost benefit
10 analysis for each of the Management Audit recommendations;
- 11 • Exhibit ____ (KSZ-2) is a copy of National Grid’s recent
12 Implementation Plan Update (filed with the Public Service
13 Commission (“Commission”) on January 19, 2017) summarizing the
14 status of National Grid’s implementation of each Management Audit
15 recommendation.
- 16 • Exhibit ____ (KSZ-3) is a chart showing the implementation status of
17 each Management Audit recommendation as of March 29, 2017.

18

Testimony of Keri Sweet Zavaglia

1 **III. Management Audit Implementation Plan**

2 **Q. Please provide a brief summary of the Management Audit process.**

3 A. In February 2013, the Commission authorized issuance of a Request for
4 Proposals (“RFP”) for an independent consultant to conduct an audit of
5 National Grid’s New York gas business in accordance with Section 66(19)
6 of the Public Service Law (“PSL”). In June 2013, the Commission
7 selected NorthStar to conduct the audit under the supervision of
8 Department of Public Service Staff (“Staff”). From August 2013 through
9 July 2014, NorthStar audited National Grid’s New York gas business,
10 focusing on eight traditional audit areas:

- 11 • Corporate mission, objectives, goals and planning;
- 12 • Load forecasting;
- 13 • Supply procurement;
- 14 • System planning;
- 15 • Capital and operations and maintenance (“O&M”) budgeting;
- 16 • Program and project planning and management;
- 17 • Work force management; and
- 18 • Performance and results measurement.

19
20 In addition, the Commission directed that the scope of the Management
21 Audit include an assessment of National Grid’s information systems,

Testimony of Keri Sweet Zavaglia

1 including the “adequacy and efficiency of the customer information and
2 billing systems used to support management information and customer
3 service operations.”

4
5 NorthStar, in coordination with Staff, conducted a thorough and
6 professional audit marked by open and productive discussions among the
7 parties. Throughout the Management Audit, National Grid fully
8 cooperated with NorthStar in the interest of supporting audit
9 recommendations that were well-informed and meaningful. NorthStar
10 received full access to National Grid’s personnel, records, and systems
11 over a ten-month discovery period during which National Grid answered
12 more than 700 data requests and participated in over 200 management
13 interviews.

14
15 **Q. Please describe the results of the Management Audit.**

16 A. In August 2014, NorthStar issued its audit report (“Management Audit
17 Report”) that described generally strong performance by National Grid in
18 a number of key functional areas, including gas operations, load
19 forecasting, supply procurement, and customer information systems. The
20 Management Audit Report offered 31 recommendations aimed at

Testimony of Keri Sweet Zavaglia

1 improving National Grid's performance. The Commission released the
2 Management Audit Report on October 2, 2014.

3
4 While the Company did not agree with all of NorthStar's findings and
5 conclusions, National Grid acknowledged that, overall, NorthStar's
6 recommendations provide a constructive means of enhancing the day-to-
7 day performance of the New York gas business. Accordingly, National
8 Grid generally accepted the recommendations presented in the
9 Management Audit Report.

10
11 On November 3, 2014, pursuant to PSL Section 66(19), the Company filed
12 an initial Implementation Plan with the Commission detailing its plans to
13 implement the Management Audit recommendations. Thereafter, National
14 Grid and Staff collaborated to review and discuss the initial
15 Implementation Plan. Staff determined that the initial Implementation
16 Plan was generally acceptable, but recommended certain changes and
17 clarifications. Based on feedback from Staff, National Grid filed a revised
18 Implementation Plan with the Commission on April 21, 2015.

Testimony of Keri Sweet Zavaglia

1 **Q. Did the Commission accept National Grid’s Implementation Plan?**

2 A. Yes. On May 14, 2015, the Commission issued an *Order Approving an*
3 *Implementation Plan* (“Order”). In the Order, the Commission approved
4 National Grid’s revised Implementation Plan and directed the Company to
5 implement the proposed actions described therein.

6
7 **Q. Please describe National Grid’s approach to implementing the**
8 **Management Audit recommendations.**

9 A. National Grid viewed the Management Audit process as an opportunity to
10 assess and improve its management of gas operations, systems,
11 governance, and processes as part of its ongoing effort to drive overall
12 improvement for the benefit of customers. National Grid has appreciated
13 the collaborative efforts of NorthStar and Staff throughout the process and
14 recognizes that the Management Audit recommendations provide positive
15 and constructive insights about how the Company may improve its
16 processes. Therefore, the Company is making every effort to implement
17 the Management Audit recommendations.

18
19 The Implementation Plan reflects the Company’s consideration of the
20 Management Audit Report recommendations and desire to realize the
21 benefits identified by NorthStar, as well as the collaboration with Staff

Testimony of Keri Sweet Zavaglia

1 that helped to improve it. Accordingly, the Implementation Plan outlines
2 constructive, cost effective solutions to the Management Audit
3 recommendations that will enhance National Grid's ability to provide
4 service to our customers in New York.

5
6 **Q. What does the Order require with regard to reporting on the status of**
7 **the Implementation Plan?**

8 A. National Grid must file a written update to the Implementation Plan at
9 least every four months. The update must describe the implementation
10 status of each recommendation, implementation action steps (major
11 activities), and associated implementation schedules. To date, the
12 Company has submitted six updates to the Implementation Plan. These
13 reporting requirements continue until Staff determines that the
14 Implementation Plan is fully implemented. In addition to the formal
15 reporting requirements, the Company and Staff have periodically met to
16 address key initiatives the Company is undertaking, such as the
17 recommendations regarding National Grid's gas supply procurement and
18 forecasting functions.

Testimony of Keri Sweet Zavaglia

1 **Q. What is the current status of the Company's compliance with the**
2 **Implementation Plan?**

3 A. The Company's most recent implementation plan update, filed January 19,
4 2017, is attached as Exhibit ____ (KSZ-2). Based on discussions with
5 Staff, as of March 29, 2017, 16 recommendations are "Implemented," 13
6 recommendations are "Pending Review," and two recommendations are
7 "In Progress." "Pending Review" means the Company's actions to
8 implement the recommendation have been completed and are pending
9 review by Staff. Upon acceptance by Staff, the recommendation is
10 deemed "Implemented." A recommendation that is "In Progress" has
11 implementation action steps that are either ongoing or on hold pending
12 other decisions or activities. A summary of the current status is attached
13 as Exhibit ____ (KSZ-3).

14
15 **Q. Please explain the recommendations that are "In Progress."**

16 A. The Company is mindful of the need to implement the recommendations
17 in the most efficient and effective manner possible. The two remaining
18 "In Progress" recommendations, Recommendations VII-1 and 2, involve
19 National Grid's productivity and work management tracking and reporting
20 capabilities.

21

Testimony of Keri Sweet Zavaglia

1 In the Implementation Plan, the Company identified short and long term
2 solutions to implementing enhanced productivity and work management
3 tracking capabilities. To date, the Company has made good progress in
4 developing and implementing daily and weekly individual worker
5 productivity reporting for the customer meter services function, including
6 the capability to track productivity at the yard level. Productivity reports
7 in this area now measure and report on individual worker productivity for
8 the business. The Company has also developed a methodology for
9 tracking unit costs at the yard level. For the long term solution to
10 implementing these recommendations, National Grid is currently
11 designing a new front-office system that will consolidate multiple work
12 management and mobility applications and processes to enhance the
13 Company's ability to deliver standardized productivity reporting in these
14 areas. This system, known as Gas Business Enablement, is described in
15 more detail in the testimony of the Gas Infrastructure and Operations
16 Panel.

Testimony of Keri Sweet Zavaglia

1 **IV. Management Audit Implementation Costs**

2 **Q. Did the Management Audit consider the costs to implement and any**
3 **savings associated with the recommendations?**

4 A. Yes, in the RFP for the Management Audit, the Commission directed that
5 the “recommendations developed by the [auditor] should be accompanied
6 by customer benefit analyses which take into account, among other things,
7 one-time and ongoing costs, potential benefits and risks, and potential
8 savings or efficiencies.” Accordingly, NorthStar filed a separate
9 “customer benefit analysis” (“CBA”) that describes the expected costs and
10 benefits resulting from the implementation of each recommendation and,
11 where applicable, a five-year payback analysis. NorthStar’s estimates of
12 implementation costs and any potential savings for each of the
13 recommendations are summarized in Exhibit ____ (KSZ-1).

14

15 **Q. Are there incremental costs associated with the Management Audit**
16 **recommendations in the gas revenue requirement?**

17 A. Yes. The gas revenue requirement includes the cost of one incremental
18 full time equivalent (“FTE”) in Energy Procurement to implement
19 Recommendation IX-4. The FTE was hired in January 2017, as discussed
20 in the testimony of Company Witness Elizabeth D. Arangio. The cost in

Testimony of Keri Sweet Zavaglia

1 the gas revenue requirement reflects Niagara Mohawk's allocable share of
2 labor costs for this FTE.

3

4 **Q. How are the benefits of implementing the Audit recommendations**
5 **reflected in this filing?**

6 A. The Management Audit Report identified several primary categories of
7 benefits of implementing the recommendations, including:

- 8 • Enhancing corporate governance and decision making;
- 9 • Improving work management and tracking;
- 10 • Increasing data availability and analysis; and
- 11 • Improving work methods and processes.

12 Potential Company and customer benefits of implementing the various
13 recommendations include reliability and safety improvements, customer
14 service enhancements, future cost avoidance, and risk or volatility
15 reduction. The benefits may be one-time, enduring, or of limited duration.

16

17 **Q. Did NorthStar identify cost savings for all of the Management Audit**
18 **recommendations? If so, are they reflected in the Rate Year?**

19 A. While NorthStar's CBA identified qualitative benefits for all of the
20 recommendations, most recommendations do not have quantifiable cost
21 savings. For example, Recommendation III-1, directed at recruiting and

Testimony of Keri Sweet Zavaglia

1 appointing an independent Director for the NG USA Board, will benefit
2 the Company and customers, but such benefits are not readily measured.

3
4 For the recommendations where NorthStar identified potential cost
5 savings, those savings are not separately reflected in the Rate Year
6 because (i) the recommendation involves costs that are not included in the
7 Company's costs of service because they are pass through items (*e.g.*, the
8 recommendations relating to gas supply procurement (Recommendation
9 VIII-2)) or (ii) the recommendation is not yet implemented and the cost to
10 implement is expected to outweigh any savings over the next few years
11 (*e.g.*, work productivity tracking systems (Recommendation VII-1)).

12 13 **V. Data and Staffing Audits**

14 **Q. Please provide a brief summary of the Data Audit.**

15 A. In August 2013, pursuant to PSL Section 66(19), the Commission
16 instituted an operations audit of the accuracy of the New York utilities'
17 self-reported data regarding electric reliability, gas safety, and customer
18 service. The Commission selected Overland Consulting ("Overland") to
19 conduct the audit. On April 20, 2016, the Commission issued an order
20 publishing the final report and directing the utilities to file implementation
21 plans for certain audit recommendations. With respect to the majority of

Testimony of Keri Sweet Zavaglia

1 the customer service recommendations, the Commission remanded those
2 recommendations to a separate proceeding (Case 15-M-0566) for further
3 consideration.

4

5 **Q. What is the status of National Grid's implementation plan efforts?**

6 A. National Grid filed its implementation plan on May 19, 2016 in Case 13-
7 M-0314. In the implementation plan, National Grid identified 69
8 recommendations as "Pending Review" and 37 recommendations as "In
9 Progress." On March 10, 2017, the Commission issued an order
10 approving the plan and directing National Grid to begin implementation
11 efforts. The Company is currently in the process of implementing the
12 recommendations.

13

14 **Q. Please provide a brief summary of the Staffing Audit.**

15 A. In January 2014, the Commission instituted an audit of the internal
16 staffing levels and use of contractors for selected core utility functions at
17 the major New York utilities. The Commission selected The Liberty
18 Consulting Group ("Liberty") to conduct the audit. On February 21, 2017,
19 the Commission authorized the public release of Liberty's audit report.
20 Liberty identified a total of 27 recommendations aimed at enhancing
21 National Grid's staffing and workforce management processes. National

Testimony of Keri Sweet Zavaglia

1 Grid filed its implementation plan on March 23, 2017 in Case 13-M-0449.
2 A Commission order regarding the Company's implementation plan is
3 expected later this year.

4

5 **Q. Are there incremental costs or quantifiable benefits associated with**
6 **the Data Audit or Staffing Audit recommendations?**

7 A. No. The audits were both designed to improve processes across the New
8 York utilities and benefits from the recommendations are largely
9 qualitative. Neither Overland nor Liberty performed a CBA. Benefits
10 include improvements to the processes for collecting and reporting data
11 and enhancements to the staffing and workforce management processes.
12 Costs to implement the recommendations are largely *de minimis*.

13

14 **Q. Does that conclude your testimony?**

15 A. Yes it does.

Exhibits of
Keri Sweet Zavaglia

Testimony of Keri Sweet Zavaglia

Index of Exhibits

Exhibit__ (KSZ-1)	Management Audit Recommendations and Cost Benefit Analysis Summary
Exhibit__ (KSZ-2)	National Grid's Implementation Plan Update (January 2017)
Exhibit__ (KSZ-3)	Implementation Status of Each Management Audit Recommendation (March 29, 2017)

Testimony of Keri Sweet Zavaglia

Exhibit __ (KSZ-1)

Management Audit Recommendations

and

Cost Benefit Analysis Summary

SUMMARY OF NORTHSTAR RECOMMENDATIONS AND CUSTOMER BENEFIT ANALYSES

Chapter	#	NorthStar Recommendation	Major Implementation Items	NorthStar's Estimated Implementation Cost	NorthStar's Estimated Cost Savings
III	1	Reconstitute the NGUSA BOD by: 1) limiting the number of members who are also part of the US Executive Team, NGUSA Officers and Senior Managers to no more than two; 2) appoint at least one truly independent, qualified Director who is not employed by any National Grid company; 3) filling the remainder of Director seats with either NG UK or NG-plc executives, or other independent, qualified individuals. Define the roles and responsibilities of the NGUSA BOD.	Recruit/appoint new NG USA Board, including independent director. Adopt terms of reference to clearly define Board's role and responsibilities.	Reoccurring: \$330,000/year Independent director fee; incremental labor and travel time for board members Update: Independent fee is approximately \$30,000/year; no incremental labor or travel	None
III	2	Reconstitute the BODs for KEDLI, KEDNY, and NMPC by: 1) limiting the number of members who are part of the New York Jurisdictional team, regardless of reporting relationship, to no more than one Director; and 2) filling the remaining two Director positions with executives from the other NY jurisdictions or NGUSA who do not have responsibilities for New York operations. Define the roles and responsibilities of the subsidiary boards.	Appoint new NY boards. Adopt terms of reference to clearly define role and responsibilities.	None	None
III	3	Continue to evolve the Jurisdictional organization model to establish a clear command and control structure for the NY Jurisdictional President	Implement modifications to jurisdictional model.	None	None

Chapter	#	NorthStar Recommendation	Major Implementation Items	NorthStar's Estimated Implementation Cost	NorthStar's Estimated Cost Savings
III	4	Establish a Chief Risk Officer within the NGUSA organization, reporting to the President NGUSA, with responsibility and appropriate authority, for coordinating, reviewing challenging the results of all the various risk assessment groups.	Appoint US Chief Risk and Compliance Officer	One Time: \$75,000 Reoccurring: \$625,000-700,000/year Recruiting fee, salary and administration <u>Update:</u> Appointed US GC for CRO position; minimal incremental cost.	Cannot be quantified
III	5	Prepare a true strategic plan for National Grid's New York operations to serve as a road map for National Grid's investments, programs and operations in the state.	Develop NY business plans	One Time: \$115,000 Reoccurring: \$60,000/year Incremental labor to prepare strategic plans	None
III	6	Conduct, or contract with qualified outside auditor for, an investigation into the cost impacts of the LIPA separation on ratepayers, and provide a report to the PSC staff within six months. (Details in chapter)	Prepare LIPA separation report	One Time: \$19,000 80 hours to perform analysis with internal audit staff or external auditors	None
IV	1	Keep the Finance and SAP related costs (termed "rent" charges) at previous rate case agreed upon levels. Do not allow consequential costs for fixing the USFP, Financial Remediation and IS issues to be borne by ratepayers. Identify and justify any cost increases above previously rate case approved capital and operating expense levels.	Prepare USFP cost report.	N/A	Review \$560 million of USFP costs (\$129 million allocable to NY); no specific savings identified.

Chapter	#	NorthStar Recommendation	Major Implementation Items	NorthStar's Estimated Implementation Cost	NorthStar's Estimated Cost Savings
IV	2	Develop SLAs to govern the relationship between the jurisdictional operating companies and the Service Company. For all products and services provided to NY gas utilities from ServCo, SLAs must become the equivalent of commercial agreements. (Details in chapter)	Develop FY16 and FY17 SLAs	None	Cannot be quantified
V	1	Develop an integrated natural gas system-wide plan. The system plan should include all reliability work, mandated replacements, growth projects and system planning work identifiable over a five-year period. (Details in chapter)	Develop and formalize an integrated 5 Year System Planning Process	None	None
V	2	Update the companies' IMPs to comply with § Part 192.911. (details in Chapter)	Update IMP	Minimal	None
V	3	Update procedural documentation/manuals to comply with § 192.614 and § 192.615. (Details in chapter)	Review procedural documentation/manuals.	Minimal	None
VI	1	Address deficiencies identified in the Project Management group's adherence to the Playbook project documentation requirements. (Details in chapter)	Update the Project Management Documentation Policy/Playbook	Minimal; \$7,000/year	None
VI	2	Complete the development of a new estimating process for project-managed gas projects that more closely reflects complex project requirements by the end of CY2014.	Develop a Gas Estimating Department within the Gas Systems Engineering Organization.	Company: Labor - \$900k to \$1.2M/year Software - \$400k-500k	None
VI	3	Implement a WBS system to organize and manage gas projects as part of the implementation of Primavera P6.	Implement Primavera's project management tool into the Gas organization.	One Time: \$100,000 Reoccurring: \$30,000/yr Company: One Time: \$200,000-300,000 Reoccurring: \$100,000/yr	None

Chapter	#	NorthStar Recommendation	Major Implementation Items	NorthStar's Estimated Implementation Cost	NorthStar's Estimated Cost Savings
VI	4	Institute a process to track, monitor and report complex project status, including: budget variances, committed costs and actual costs to date, estimated cost at completion, projected year-end expenditures, schedule variance, pending and approved scope changes, and progress-to-date.	Incorporate the use of a WBS for complex gas projects.	Included in VI-3	None
VI	5	Institute controls to ensure the project change control logs are updated on a timely basis and that accurate change order information is contained in the Project Summary Reports.	Various process improvements to ensure accurate recording of change controls for gas complex projects.	Minimal	None
VI	6	Resolve data issues regarding the KPIs for materials services and the fleet metrics reports.	Resolve KPI data issues.	None	None
VII	1	Develop and implement, within the existing work management processes and systems, a program to track and manage crew and individual worker productivity. (Details in chapter)	Develop a new work management system.	One Time: \$650,000 Systems and Training Company: \$5.8M	Cannot be quantified
VII	2	Develop a manpower planning program. (Details in chapter)	Covered in VII-1.	One Time: \$500,000 Systems and Training	Cannot be quantified
VIII	1	Retain day-ahead forecasts of send out and weather and other input assumptions, and conduct comparison of forecast to actual send out, including forecast weather, actual weather, forecast send out and actual send out. Develop a reporting process for determining the performance of the day ahead model.	Capture the daily results of its day-ahead forecast.	O&M: \$150,000/year	Unquantified savings in gas supply purchases

Chapter	#	NorthStar Recommendation	Major Implementation Items	NorthStar's Estimated Implementation Cost	NorthStar's Estimated Cost Savings
VIII	2	Re-evaluate the residential forecasting model to identify opportunities to improve accuracy in forecasting during warm winters and to reduce variations from year to year in forecast results.	Review residential forecasts for the New York Operating Companies	One Time: \$20,000 Reoccurring: \$45,000 Incremental labor to perform additional analyses	As much as \$500,000 in gas supply savings
VIII	3	Due to the complexity of the forecasting platform, improve reporting of performance on a level that is easily understood by upper management and outsiders.	Develop output reports from the Gas Load Forecasting process	Included in VIII-2	Included in VIII-2
VIII	4	Analyze the treatment of energy efficiency goals in the sales, send out and design day forecasting processes and models, to identify opportunities to improve accuracy and minimize impacts of over forecasting future savings.	Analyze treatment of energy efficiency goals.	Included in VIII-2	Included in VIII-2
IX	1	Modify policies and procedures regarding the procurement of long-term supply and delivery commitments (longer than one year).	Various process improvements.	One Time: \$62,500 Reoccurring: \$85,000 year Incremental labor	Cannot be quantified
IX	2	As part of the annual gas supply plan submitted to the PSC, or in a separate filing, specifically document the five-year supply/demand balance and capacity plans.	Transition to a ten-year forecast and planning horizon.	\$40,00-60,000 Incremental labor	None
IX	3	Add a representative from the Energy Procurement group to the NY Leadership Team as a regular full participant.	Add Energy Procurement rep to New York Leadership Team.	Reoccurring: \$10,000 year Incremental labor	None
IX	4	Modify policies and procedures covering the monthly and daily procurement forecasting and "set up" processes for each of the operating companies.	Enhancing its policies and procedures consistent with the recommendation.	Included in XIII(1) above	Cannot be quantified

Chapter	#	NorthStar Recommendation	Major Implementation Items	NorthStar's Estimated Implementation Cost	NorthStar's Estimated Cost Savings
IX	5	Develop a gas supply performance review process, including a monthly metrics scorecard and associated reporting that assesses the overall performance of the Energy Procurement group in managing the gas supply portfolio.	Developed four performance metrics for the gas supply function.	None	None
IX	6	Conduct a thorough investigation of the allocation and assignment of costs, particularly labor costs, from Energy Procurement to the NY gas utilities to identify the reasons for the NY Gas utilities receiving an apparent disproportionate share of costs.	Prepare a report addressing allocation of costs to Energy Procurement.	One Time: \$30,000 Incremental labor	\$250,000-300,000/year Labor savings Update: The Company's report explained that these costs were the result of changes in allocations and cost centers; no savings.
XI	1	With the FY 2016 planning cycle (beginning in FY 15), modify the performance management process to replace Elevate 2015 and better align NG-plc, NGUSA, NY jurisdiction, and NY Operating Company goals and objectives with a more robust set of performance metrics.	Establish FY16 Objectives and Metrics.	None	None
XI	2	Continue to evolve the SLAs.	Covered in IV-2	None	Cannot be quantified

Testimony of Keri Sweet Zavaglia

Exhibit __ (KSZ-2)

National Grid's Implementation Plan Update (January 2017)

January 19, 2017

VIA ELECTRONIC FILING

Honorable Kathleen H. Burgess, Secretary
New York State Public Service Commission
3 Empire State Plaza, 19th Floor
Albany, NY 12223-1350

Re: Comprehensive Management and Operations Audit of National Grid
USA's New York Gas Companies; Case Number 13-G-0009

Dear Secretary Burgess,

Attached please find The Brooklyn Union Gas Company d/b/a National Grid NY, KeySpan Gas East Corporation d/b/a National Grid and Niagara Mohawk Power Corporation d/b/a National Grid's January 2017 Implementation Plan Update for the *Comprehensive Management and Operations Audit of National Grid USA's New York Gas Companies* prepared by NorthStar Consulting Group.

Implementation updates for the thirty-one recommendations in the Audit Report are grouped into three status categories: "In Progress"; "Pending Review"; and "Implemented." Since the Company's last update report in September 2016, the status of four recommendations (III-3: Jurisdictional Model, III-4: Chief Risk Officer, IX-2 and 3: Gas Supply Procurement) have been updated to reflect that they are now Implemented; the status of three recommendations (III-1: US/NY Boards, VI-2 Estimating Program for Gas Projects and IX-4 Gas Procurement Procedures) have been updated to reflect that they are now Pending Review.

Please call me with any questions regarding the Implementation Plan Update.

Very truly yours,

/s/ Philip A. DeCicco
Philip A. DeCicco

Comprehensive Management and Operations Audit of National Grid USA's New York Gas Companies

Case No. 13-G-0009

IMPLEMENTATION PLAN UPDATE

PREPARED FOR:

THE STATE OF NEW YORK PUBLIC SERVICE COMMISSION
THREE EMPIRE STATE PLAZA
ALBANY, NEW YORK 12223

January 2017



INTRODUCTION

A. Background

In accordance with the Commission’s May 14, 2015 Order,¹ The Brooklyn Union Gas Company d/b/a National Grid NY, KeySpan Gas East Corporation d/b/a National Grid and Niagara Mohawk Power Corporation d/b/a National Grid (collectively, “National Grid” or the “Company”) offer the following Implementation Plan Update in connection with the August 2014 “Comprehensive Management and Operations Audit of National Grid USA’s New York Gas Companies” (the “Audit Report”) prepared by NorthStar Consulting Group. The Audit Report contains thirty-one recommendations aimed at improving the Company’s performance. For each recommendation, the Company’s Implementation Plan (filed on April 21, 2015) sets forth: the Company’s proposal to implement the recommendation; the team leads and executive sponsor; an implementation schedule; a cost/benefit analysis associated with implementing the recommendation; and an implementation priority. This Implementation Plan Update describes the Company’s progress implementing each recommendation as of January 2017.

B. Implementation Plan Progress Summary

Table 1 provides a snapshot of implementation progress on the thirty-one recommendations in the Audit Report:

Table 1: Implementation Progress—Aggregate

Total Recommendations	
Implemented	4
Pending Review	25
In Progress	2

The three implementation status categories in Table 1 are defined as follows:

- **Implemented** – Action steps associated with implementing a recommendation have been completed, reviewed and accepted by Staff.
- **Pending Review** - Action steps associated with implementing a recommendation have been completed, and are pending review by Staff. Acceptance of a recommendation as complete will be determined following Staff’s review.
- **In Progress** – Actions associated with implementing a recommendation are on-going or on hold pending other decisions or activities.

Since the Company’s last update report in September 2016, the status of four recommendations (III-3: Jurisdictional Model, III-4: Chief Risk Officer, IX-2 and 3: Gas Supply Procurement) have been updated to reflect that they are now Implemented; the status of three recommendations (III-1: US/NY Boards, VI-2 Estimating Program for Gas Projects, and IX-4 Gas Procurement

¹ Case 13-G-0009 – *Comprehensive Management and Operations Audit of National Grid USA’s New York Gas Companies*, “Order Approving an Implementation Plan” (Issued and Effective May 14, 2015).

Procedures) have been updated to reflect that they are now Pending Review. Material updates on the Company's implementation progress are **highlighted in bold** throughout this report. Table 2 provides an updated status summary for each individual recommendation.

Table 2: Implementation Progress—Individual Recommendations

Chapter	#	Recommendation	Implementation Status
III	1	Reconstitute the NG USA Board of Directors.	Pending Review
III	2	Reconstitute the Boards for KEDLI, KEDNY and NMPC.	Pending Review
III	3	Continue to evolve the Jurisdictional organization model.	Implemented
III	4	Establish a Chief Risk Officer within NG USA.	Implemented
III	5	Prepare true strategic plans for National Grid's New York operations.	Pending Review
III	6	Investigate the cost impacts of the LIPA separation.	Pending Review
IV	1	Prepare a report that fully documents costs associated with USFP.	Pending Review
IV & XI	2	Continue to evolve the Service Level Agreements.	Pending Review
V	1	Develop an integrated natural gas system-wide plan.	Pending Review
V	2	Update the Company's Integrity Management Plan (IMP) to comply with § 192.911.	Pending Review
V	3	Update procedural documentation/manuals to comply with § 192.614 and § 192.615.	Pending Review
VI	1	Address deficiencies to the Playbook project documentation requirements.	Pending Review
VI	2	Develop an estimating program for gas projects.	Pending Review
VI	3	Implement a WBS system to organize and manage gas projects.	Pending Review
VI	4	Institute a process to track, monitor and report complex project status, including budget variances, committed costs and actual costs to date, estimated cost at completion, projected year-end expenditures, schedule variance, pending and approved scope changes, and progress-to-date.	Pending Review
VI	5	Institute controls to ensure the project change control logs are updated on a timely basis.	Pending Review
VI	6	Resolve data issues regarding the KPIs for materials services and the fleet metrics reports.	Pending Review

Chapter	#	Recommendation	Implementation Status
VII	1	Develop and implement, within the existing work management processes and systems, a program to track and manage crew and individual worker productivity.	In Progress
VII	2	Develop a manpower planning program.	In Progress
VIII	1	Retain day-ahead forecasts of send out and weather and other input assumptions, and conduct comparison of forecast to actual send out.	Pending Review
VIII	2	Re-evaluate the residential forecasting model to identify opportunities to improve accuracy in forecasting during warm winters and to reduce variations from year to year in forecast results.	Pending Review
VIII	3	Due to the complexity of the forecasting platform, improve reporting of performance on a level that is easily understood by upper management and outsiders.	Pending Review
VIII	4	Analyze the treatment of energy efficiency goals in the sales, send out and design day forecasting processes and models.	Pending Review
IX	1	Modify policies and procedures regarding the procurement of long-term supply and delivery commitments (longer than one year).	Pending Review
IX	2	As part of the annual gas supply plan submitted to the PSC, document the five-year supply/demand balance and capacity plans.	Implemented
IX	3	Add a representative from the Energy Procurement group to the NY Leadership Team.	Implemented
IX	4	Modify policies and procedures covering the monthly and daily procurement forecasting and “set up” processes for each of the operating companies.	Pending Review
IX	5	Develop a gas supply performance review process.	Pending Review
IX	6	Conduct a thorough investigation of the allocation and assignment of costs from Energy Procurement to the NY gas utilities.	Pending Review
X		No recommendation	N/A
XI	1	Modify the performance management process to replace Elevate 2015 and better align NG-plc, NG USA, NY jurisdiction, and NY Operating Company goals and objectives.	Pending Review

IMPLEMENTATION PLAN UPDATES

Chapter III: Corporate Mission, Objectives, Goals and Planning

Recommendation III-1 and 2

Recommendation III-1. Reconstitute the NG USA BOD by: 1) limiting the number of members who are also part of the US Executive Team, NG USA Officers and Senior Managers to no more than two; 2) appointing at least one qualified truly independent Director who is not employed by any National Grid company; and 3) filling the remainder of Director seats with either NG UK or NG-plc executives, or other independent, qualified individuals. Define the roles and responsibilities of the NG USA BOD to include those typical of a corporate BOD, including review of financial performance and external auditor reports, review of risks, approval of both capital and operating budgets, and the ability and expectation to challenge and reject recommended projects and actions.

Recommendation III-2. Reconstitute the BODs for KEDLI, KEDNY, and NMPC (“New York Operating Companies”) by: 1) limiting the number of members who are part of the New York Jurisdictional team, regardless of reporting relationship, to no more than one Director; and 2) filling the remaining two Director positions with executives from the other US jurisdictions or NG USA who do not have responsibilities for New York operations. Define the roles and responsibilities of the subsidiary boards to include review of operating and financial performance, review of relevant external auditor statements, approval of service levels and budgets (e.g., SLAs), and approval of specific plans impacting their service territory, such as rate filings, major capital projects, and significant customer programs.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Ronald Macklin, US General Counsel Ken Daly, President – New York Jurisdiction
<i>Team Lead(s):</i>	Timothy McAllister, Assistant General Counsel and Director Philip DeCicco, Assistant General Counsel and Director

Implementation Priority: III-1 High; III-2 Medium

Recommendation Accepted: III-1 Yes (with modifications); III-2 Yes (with modifications)

Current Status: Pending Review (III-1)/Pending Review (III-2)

NG USA Board of Directors

In the revised New York Gas Management Audit Implementation Plan, the Company proposed to reconstitute NG USA’s Board in a manner generally consistent with the recommendation:

- No more than three (3) directors will be members of the US management team;
- One director will be an independent director who is not an employee of the Company; and
- Other directors will be either NG UK or NG-plc executives, or other independent, qualified

individuals.

In May 2015, the Company appointed a three person board, consisting of two US senior management members, and one independent director (Thérèse Esperdy). Ms. Esperdy has served as a Non-executive Director of the Board of National Grid plc since March 2014 and currently chairs the Finance Committee. The Company has since appointed a third director (Cheri Warren) who is member of the US management team.

With regard to the recommendation that NG USA appoint additional NG UK directors, the Company has determined that appointing UK directors presents a number of logistical and other challenges, including potential adverse tax implications, that makes it impractical to implement this component of the recommendation. Accordingly, the Company does not intend to appoint additional UK directors to the NG USA Board at this time (discussed below).

In addition, the NG USA Board (and each of the New York Operating Companies' boards) has adopted terms of reference that clearly define the board's roles and responsibilities.

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Recruit/appoint new Board, including independent director	4/30/15	Independent Director Appointed - May 2015	In Progress
Adopt terms of reference to clearly define role	1/30/15	January 2015	Completed

Implementation Plan Update. In November 2016, the Company filed an amendment to its Implementation Plan to modify the implementation deliverables for the recommendation addressing the composition of National Grid's US holding company board. The Company believes the amendment, which will eliminate the original proposal to include non-US directors on the board, will promote efficient corporate governance and that the action items already implemented in this area, particularly the appointment of an independent director, have effectively addressed the audit recommendation. With this modification to the Implementation Plan, the Company will have fully implemented the recommendations regarding the NG USA board. **(Updated January 2017)**

New York Operating Companies' Board of Directors

For the New York Operating Companies' boards, following the release of the Audit Report, National Grid and Staff discussed maintaining a New York focus on these boards by appointing a majority of New York directors (notwithstanding the Audit Report recommendation to appoint non-New York managers). The Company believes it is important that the operating companies' directors are familiar with the unique operating, financial and regulatory challenges facing the New York businesses. Accordingly, as described in the revised New York Gas Management

Audit Implementation Plan, the Company appointed a majority of directors on the New York operating company boards who are members of the New York Jurisdictional management team.

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Reconstitute (as necessary) the BOD to include a majority of New York executives	4/30/15	May 2015	Completed
Adopt terms of reference to clearly define role	1/30/15	January 2015	Completed

Chapter III – Corporate Mission, Objectives, Goals and Planning

Recommendation III-3

Continue to evolve the Jurisdictional organization model to establish a clear command and control structure for the NY Jurisdictional President, as described by NG USA executives during the audit.

- Improvements should include direct organizational reporting relationships between the NY Jurisdictional President and the full-time dedicated, senior managers who are responsible for the core utility operations and performance of the NY utilities.
- The NY Jurisdictional President should have direct reporting and control over NY-dedicated support personnel that plan, execute, monitor and control activities in support of the NY jurisdiction and operating companies.
- As indicated by NG USA Executives, this evolution is not a major reorganization nor should it result in increased headcount, but rather a re-alignment of reporting responsibilities and clarification of roles and responsibilities.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Dean Seavers, President – NG USA Ken Daly, President – New York Jurisdiction
<i>Team Lead(s):</i>	Roger Young, SVP – US Human Resources

Implementation Priority: High

Recommendation Accepted: Yes

Current Status: Implemented

NY Jurisdiction Organization Design

In April 2015, the Company modified its jurisdictional model to enhance operational accountability to the NY Jurisdictional President. Specifically, as described in the revised New York Gas Management Audit Implementation Plan, key members of the NY Leadership Team now report directly to the New York Jurisdictional President. These direct reports, which currently include senior managers from Gas Operations, Electric Operations and Network Strategy, are accountable to the NY Jurisdictional President and their performance will be evaluated based on the success of the New York Operating Companies.

In addition to the realignment of key members of the New York Management Team, effective April 1, 2015, employees reporting to the Vice Presidents of New York Electric and Gas Operations moved to the NY Jurisdiction. As a result, more than 2,600 electric and gas operations personnel supporting the New York utilities now report under the NY Jurisdictional

President.

With regard to the New York regulatory function, the Company has reconsidered and determined that the NY Regulatory and Pricing officer should report directly to the Senior Vice President for US Regulation, and report to the NY Jurisdictional President in a matrix reporting relationship. This approach allows National Grid to better coordinate its regulatory strategy across the US business, while at the same time providing for a senior, dedicated New York regulatory officer to coordinate with the NY Jurisdictional President on significant regulatory matters.

Organization design work to strengthen the jurisdictional model is ongoing. Going forward, the Company will continue to review the jurisdictional model to identify if additional adjustments are appropriate and beneficial.

Cross-Jurisdictional Coordinating Review

To further allow the Jurisdictional Presidents to monitor and review functional performance by the service company, National Grid established a cross-jurisdictional coordinating review (“CJR”) process, with executive representation from the jurisdictions and US functions. The CJR involves an operating company by operating company performance review, including a review of performance against SLA metrics.

Execution of the Enhanced Jurisdictional Model

With more than a year’s experience, the enhanced jurisdictional model has proven successful. The NY Jurisdiction President has direct control over the core gas and electric field operations teams and there is greater alignment and transparency among the service company functions, which is evident in weekly calls and monthly performance meetings. The enhanced structure has also resulted in improved alignment in objective setting and the priorities of the New York Jurisdiction are clearly reflected across the organization.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Implement modifications to jurisdictional model	April 2015	April 2015	Completed

Chapter III – Corporate Mission, Objectives, Goals and Planning

Recommendation III-4

Establish a Chief Risk Officer within the NG USA organization, reporting to the President NGUSA, with responsibility and appropriate authority, for coordinating, reviewing and challenging the results of all the various risk assessment groups, including the CRT, the CET/SOX compliance, Ethics and Compliance, and IAD to identify risk trends, track and manage financial and operating risks with materiality below NG-plc levels, and monitor that the plans prepared by the risk owners are appropriate and represent the best cost solution. This individual needs sufficient authority to direct changes in response to risks, and needs to remain sufficiently independent of the operations that they are able to identify patterns, and challenge assumptions patterns with impartiality. This individual should also work to implement necessary changes in the NG USA internal controls processes so that, as part of the controls processes, sufficient attention is paid to findings that are material at lower reporting levels, and gaps/issues are brought to the attention of the relevant Jurisdictional President and the President, NG USA.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Ronald Macklin, US General Counsel (for Dean Seavers, President – NG USA and Alison Kay, Group General Counsel & Company Secretary)
<i>Team Lead(s):</i>	Ronald Macklin, US General Counsel

Implementation Priority: High

Recommendation Accepted: Yes (with modifications)

Current Status: Implemented

US Chief Risk and Compliance Officer

Consistent with NorthStar’s recommendation, National Grid’s US General Counsel was appointed the US Chief Risk and Compliance Officer. The US Chief Risk and Compliance Officer is responsible for coordinating, reviewing and challenging the results of the risk, compliance and ethics groups, reporting to US management and the NG USA BOD, where appropriate.

In addition, as described in the Implementation Plan, National Grid appointed a new Global Head of Assurance (with a reporting relationship to the US Chief Risk and Compliance Officer) who is primarily responsible for coordinating, reviewing and challenging the results of various risk assessment groups, including compliance and ethics. The Global Head of Assurance is also responsible for defining risks, providing assurance and ensuring consistency across all National

Grid businesses.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Effective Date of the US Chief Risk and Compliance Officer	April 2015	April 2015	Completed
Appoint Global Head of Assurance	April 2015	November 2014	Completed

Chapter III – Corporate Mission, Objectives, Goals and Planning

Recommendation III-5

Prepare a true strategic plan for NG USA’s New York operations to serve as a road map for investments, programs and operations in the state. The strategic plan should build on the state energy policy and Connect21 whitepapers and incorporate other PSC, state and federal energy and regulatory initiatives. The initial strategic plan should be presented to the NG USA BOD and the PSC within six months, and should be updated and presented annually thereafter.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Ken Daly, President – New York Jurisdiction
<i>Team Lead(s):</i>	Keri Sweet Zavaglia, Vice President – NY Performance & Strategy

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

Consistent with the audit recommendation, in 2015, the Company developed a preliminary business plan for the New York Operating Companies. As suggested by NorthStar, the business plan outlines the Company’s New York strategic priorities and growth plans.

The Company is now focused on enhancing the format, content and usability of its business plan and, therefore, is currently working to develop a new business plan consistent with the auditor’s recommendation. The business plan will incorporate the strategy in the Connect21 paper regarding the future of the utility industry, as well as the paper on New York State Energy Policy (including various REV initiatives). The business plan will also reflect National Grid USA’s annual priorities and goals to ensure alignment.

National Grid has enhanced the format, content and usability of its business plans, which were effective April 1, 2016. The Company has created one New York business plan with information specific to each operating company clearly defined. The plan was presented to the New York leadership team at its April performance meeting and will be distributed across the teams supporting the New York business. The intent of the plans is to reflect National Grid’s strategy and vision and describe the goals and priorities of the New York businesses and how they are consistent with and advance National Grid’s strategy. The plan describes how the goals and objectives will be achieved and identifies the metrics that will be used to measure performance. The intent of the plan was also to create a single source document for employees as a reference and guidance on National Grid and the New York operating company strategies. In preparing the plan, it was evident that this information was previously contained in numerous documents and not

readily accessible by employees. The Company has also taken care to reflect the input from Staff and NorthStar and is committed to continuous improvement and will refine and improve its plan each year.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Initial New York Business Plan	December 2015	April 2016	Completed

Chapter III – Corporate Mission, Objectives, Goals and Planning

Recommendation III-6

Conduct, or contract with qualified outside auditor for, an investigation into the cost impacts of the LIPA separation on remaining NY operating company ratepayers, and provide a report to the PSC staff within six months. The investigation should include:

- True stranded costs broken out by labor and non-labor sources, and by capital investments and operating charges
- Expected revenues by basis (e.g., real estate, IT) and the time period for the revenue agreement.
- Incremental costs, both labor and non-labor, and capital and on-going operating costs or benefits
- Allocated costs (labor and non-labor combined if necessary), and an estimate of the aggregate impact of the reallocation of these costs on the remaining NY utilities.

The investigation should include a broad review of activities and functions that were performed with, or for the benefit of LIPA, rather than relying solely on prior listings of impacted areas. Where applicable and reasonable, existing studies can be used as sources for the cost estimates, with adjustments clearly specified. The investigation seeks to define and document the costs associated with the separation for future use.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Sharon Partridge, Vice President – Financial Planning & Analysis & Decision Support David Doxsee, Vice President – Finance (New York)
<i>Team Lead(s):</i>	Chip Benson, Director – Finance Business Partners

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Pending Review

As described in the Implementation Plan, the Company updated its analysis of the stranded, incremental and re-allocated costs resulting from the loss of the of the LIPA management agreement. The Company's analysis includes an assessment of the following transition cost items:

(i) an accounting of stranded costs (capital and O&M) resulting from the LIPA transition broken out by labor, systems, facilities, etc.; (ii) any incremental costs (labor and non-labor) and capital and on-going operating costs or benefits incurred as a result of the loss of the LIPA agreement; (iii) an estimate of the aggregate impact of reallocated costs on the New York Operating Companies; and (iv) offsetting LIPA transition charges paid by PSEG-LI.

The Company provided its LIPA transition cost analysis to Staff in September 2015.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Form team to perform stranded cost analysis	November 2014	November 2014	Completed
Develop workplan	December 2014	December 2014	Completed
Submit report to Staff	June 2015	September 2015	Completed

Chapter IV – Capital and O&M Budgeting

Recommendation IV-1

Prepare a report for submittal to the PSC staff within six months that fully documents the capital and O&M costs associated with USFP, USFP Stabilization, Finance Remediation and other financial and IS system related initiatives so that ratepayers are protected from SAP-related costs in excess of levels agreed upon in the previous NMPC and KEDNY rate cases (and for KEDLI by default). At a minimum, NG USA should:

- Document and re-establish the original capital and O&M costs underlying the rate case level.
- Clearly and specifically define the distinctions (e.g., timing, scope and cost) between the original USFP project, the USFP Stabilization Project, other SAP/USFP-related projects, the Finance Remediation Project and other financial and IS system activities.
- Specify how the costs associated with each of these activities are being tracked, monitored and verified, including: the specific project or cost codes used for dedicated internal labor, part-time or as-needed internal labor, contractors, other direct, indirect and capital costs, and the procedures for review, verification, challenge and correction of costs.
- Explain and document the impact of back-filling positions assigned to these initiatives.
- Explain and document the sources of the increase in “other IS” capital and O&M expenditures (see Exhibit IV-11) to confirm the costs are not related to the USFP Stabilization initiatives.

The purpose of the report is to provide the PSC staff with contemporaneous documentation so the costs for fixing USFP/SAP will not be borne by ratepayers, and the costs of Finance Remediation and other IS issues can be appropriately assessed in future rate cases. National Grid would continue to have the right to justify costs for SAP enhancements and other initiatives for inclusion in rates as a part of the normal rate case process.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Vivienne Bracken, SVP – Shared Services
<i>Team Lead(s):</i>	Rachel Patton – Finance

Implementation Priority: High

Recommendation Accepted: Yes (with modifications)

Current Status: Pending Review

Consistent with NorthStar's recommendation, the Company prepared a report that identified the capital and O&M costs associated with USFP, USFP Stabilization, incremental Finance Remediation costs and the capital costs associated with other IS system-related initiatives. Specifically, the Company's report (i) identified the original capital and O&M costs associated with USFP as currently included in rates; (ii) identified actual O&M and capital costs associated with USFP, USFP Stabilization, and incremental Finance Remediation costs; (iii) explained the distinctions (*i.e.*, timing, scope and cost) among the original USFP project, the USFP Stabilization Project, and the Finance Remediation Project; and (iv) explained how the costs associated with each of these activities are being tracked, monitored and verified.

The Company submitted its USFP cost report to Staff in April 2015.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Submit USFP cost report to Staff	April 2015	April 2015	Completed

Chapter IV – Capital and O&M Budgeting

Recommendations IV-2 and XI-2

- Develop improved SLAs to govern the relationship between the jurisdictional operating companies and ServCo. For products and services provided to NYS utilities from the ServCo, SLAs must emulate commercial agreements and should include:
 - Improved dialogue among the various National Grid management teams.
 - Detailed metrics addressing product and service units, volumes provided, timeframe, quality and unit prices.
 - Tracking mechanisms including quantifiable and meaningful KPIs.
 - Standardized reports across all NG USA entities.
 - Enforcement via payment only for product and service units actually provided.
 - Jurisdictional management authority to terminate and change service providers.
- Continue to evolve the SLAs to include additional KPIs addressing each of the major functions performed, include measures of efficiency, cost-effectiveness and unit costs, provide greater budgetary detail, include financial penalties for failure to achieve performance targets, relate the service company employee performance evaluation process to the SLAs, require more frequent reporting, incorporate the results of the benchmarking exercises, and improve performance targets.

Implementation Priority: Medium

Recommendation Accepted: Yes (with modifications)

Implementation Plan Leads

<i>Executive Sponsor:</i>	Keri Sweet Zavaglia, Vice President – NY Performance & Strategy
<i>Team Lead(s):</i>	Don Wolf, Director – Service Company Peter Fitzgerald, Director – Financial Planning & Analysis

Current Status: Pending Review

Consistent with NorthStar’s recommendations, National Grid has continued to expand the command and control of the New York Jurisdictional President. With gas and electric field operations now reporting to the Jurisdictional President (see Recommendation III-3), the majority of core day to day business is within his control. Accordingly, the scope of Service Level Agreements (“SLAs”) is reduced as agreements are no longer required for those functions.

However, performance management of the service company functions remains a critical component for the success of each operating company. Historically, National Grid has relied extensively on its individual employee performance process to manage performance. The result

was inconsistent, resulting in recommendations from Staff and independent auditors to improve the process. In response, National Grid looked holistically at its performance management structure, identified opportunities for improvement and has implemented a rigorous new process.

Specifically, National Grid's executive leadership team now executes a monthly cadence process that demands service company accountability and includes review and discussion of extensive material, including data on functional performance measures and cost. Structured and documented action lists are maintained and reviewed to ensure items are addressed as expected. The cadence meetings include a comprehensive and thorough look at year to date and forecast performance. In addition, each jurisdiction hosts a monthly meeting to review and discuss the performance of each operating company. In New York, compliance, financial and other metrics are reviewed in detail. Importantly, extensive documentation is continuously updated to ensure current and transparent data is reviewed throughout the month to address issues, concerns and monitor leading indicators, where applicable. The focus is enhancing accountability and substantially improving reporting and the Company is confident it has a robust performance management structure in place.

This structure does not, however, obviate the need for SLAs. National Grid recognizes that improved SLAs remain an important tool for meaningful performance management. To that end, National Grid is further improving SLAs to govern the relationship between the jurisdictional operating companies and the service company. The documents are being prepared with careful detail to include the data that is used monthly to manage performance. In the past, National Grid has prepared SLAs that are technically compliant with external requirements, but not entirely effective as management tools. The fiscal year 2017 SLAs will include the cost and services provided by the service company functions to each operating company and the metrics identified by the jurisdictional president as most important to delivering the required services. The financial data will be consistent with the detail reviewed monthly by the jurisdictional president and a process is in place to continuously monitor all metrics. The comprehensive effort completed this past year to revise, refine and enhance key performance indicators continues to be leveraged and improved. Consistent with NorthStar's recommendation, the metrics continue to evolve to include service units, volumes, timeframe, quality and unit costs, where possible. Indeed, an extensive effort is underway to further identify unit cost metrics that will enhance the data reported monthly and enable transparency of various operations related activities. As additional unit cost metrics are developed, they will be incorporated in the reporting process. Templates for presenting compliance, financial and regulatory metrics ensure detail and standardize reporting, thereby facilitating informed and consistent review of performance.

In addition to providing enhanced transparency and rigor to the oversight of the quality and cost from service company functions, these changes also enable the successful and consistent execution of National Grid's individual employee performance management process. Employees' objectives are aligned to the priorities of each jurisdiction and individual actions required to achieve those objectives are identified at the beginning of the year. Each action is tied to a key performance indicator used by the business to measure the quality and cost of the service provided. The historic disconnect between individual metrics and those used by the business to measure the service provided has been eliminated. Accordingly, individual employee performance is directly linked to the performance of the service company function. Failure to achieve a performance

metric informs the individual employee rating, which drives each employee's incentive compensation. Failure to achieve a performance metric therefore has a direct financial consequence for employees, which is consistent with National Grid's overall performance management strategy of driving performance improvements through individual accountability and transparency of data.

FY17 SLAs have been executed and implemented. The Director, NY Performance and Strategy has been assigned to monitor and track performance and report progress in monthly performance meetings.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
FY16 SLAs	July 2015	July 1, 2015	Completed
FY17 SLAs	April 2016	April/May 2016	Completed

Chapter V– System Planning

Recommendation V-1

Develop an integrated natural gas system-wide plan. The system plan should include all reliability work, mandated replacements, growth projects and system planning work identifiable over a five-year period.

- The system plan should include all projects identified based on their relative merit and need dates. It should not be limited by budget amounts.
- The system plan should be updated annually.
- It should also include associated project cost estimates, risk scores and resource requirements.
- The integrated system plan should provide input to the Investment Planning process to create the Five-Year Investment Plan.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Ross Turrini, SVP – Gas Process and Engineering
<i>Team Lead(s):</i>	Laurie T. Brown, Director – Network Strategy, Gas Amy Smith, Director – Regulatory Support Reporting

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Pending Review

National Grid’s Network Strategy organization has restructured Gas System Engineering to provide for separate asset management and gas engineering functions. The new Asset Management Engineering group will act as the “asset owners” responsible for identifying future system reinforcement, reliability and special projects for the gas system.

National Grid’s Asset Management group has developed an integrated, five-year natural gas system-wide plan that includes all reliability work, mandated replacements, growth projects and system planning work identified through FY 2022. The plan includes estimates of each New

York operating company's labor requirements for major capital programs (*e.g.*, growth, leak prone pipe, public works) in these years. The labor estimates are based on an analysis of crew sizes and forecast work requirements/units in each category.

In addition to the five year plan, Asset Management will continue to prepare longer term (10 year) system plans as part of its Strategic Infrastructure initiative. The Company will share its five and ten year gas system plans with Staff when available.

Schedule

Major Activities and Milestones	Estimated Start Date	Estimated Completion Date	Actual Completion Date	Current Status
New structure separating the engineering and asset management functions			08/1/2014	Complete
Integrate Investment Planning Group into Gas Asset Management organization			09/1/2014	Complete
Develop and formalize an integrated 5 Year System Planning Process	10/04/2014	7/1/2016	7/15/2016	Completed

Chapter V – System Planning

Recommendation V-2

Update the companies' IMPs in § Part 192.911, including:

- An identification of all high consequence areas, in accordance with § 192.905.
- A baseline assessment plan meeting the requirements of § 192.919 and § 192.921.
- An identification of threats to each covered pipeline segment, which must include data integration and a risk assessment. An operator must use the threat identification and risk assessment to prioritize covered segments for assessment (§ 192.917) and to evaluate the merits of additional preventive and mitigation measures (§ 192.935) for each covered segment.
- A direct assessment plan, if applicable, meeting the requirements of § 192.923, and depending on the threat assessed, of §§ 192.925, 192.927, or 192.929.
- Provisions meeting the requirements of § 192.933 for remediating conditions found during an integrity assessment.
- A process for continual evaluation and assessment meeting the requirements of § 192.937.
- If applicable, a plan for confirmatory direct assessment meeting the requirements of § 192.931.
- Provisions meeting the requirements of § 192.935 for adding preventive and mitigation measures to protect the high consequence area.
- A performance plan as outlined in ASME/ANSI B31.8S, section 9 that includes performance measures meeting the requirements of § 192.945.
- Record keeping provisions meeting the requirements of § 192.947.
- A management of change process as outlined in ASME/ANSI B31.8S, section 11.
- A quality assurance process as outlined in ASME/ANSI B31.8S, section 12.
- A communication plan that includes the elements of ASME/ANSI B31.8S, section 10,

and that includes procedures for addressing safety concerns.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Ross Turrini, SVP – Network Strategy
<i>Team Lead(s):</i>	Michael Kern, Director – Gas Transmission Engineering

Implementation Priority: High

Recommendation Accepted: Yes

Current Status: Pending Review

The updated and consolidated Integrity Management Program (IMP) addressing the items identified in the Audit Report was submitted to Staff in January 2015.

Chapter V – System Planning

Recommendation V-3

Update procedural documentation/manuals per § 192.614 and § 192.615, including:

- Correct any documentation deficiencies in relation to § 192.614.
 - Include the identity, on a current basis, of persons who normally engage in excavation activities in the area in which the pipeline is located.
 - If the operator has buried pipelines in the area of excavation activity, provide for actual notification of persons who give notice of their intent to excavate of the type of temporary marking to be provided and how to identify the markings.
- Correct any documentation deficiencies in relation to § 192.615.
 - Provide information about the responsibility and resources of each government organization that may respond to a gas pipeline emergency.
 - Develop plan for how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

Implementation Plan Leads

<i>Executive Sponsor:</i>	Ross Turrini, SVP – Network Strategy
<i>Team Lead(s):</i>	Michael McCallan, Director – Emergency Planning Diane Benedetto, Manager – Damage Prevention

Implementation Priority: High

Recommendation Accepted: Yes

Current Status: Pending Review

National Grid reviewed and updated the procedural documentation/manuals to ensure compliance with 192.614, Procedure 070005-PL [Preparation of Gas Facility Records] and Procedure 0010015-PL [Gas Pipeline Public Awareness and Communication].

Schedule

Major Activities	Estimated Start Date	Estimated Completion Date	Actual Completion Date	Current Status
Review procedural documentation/manuals for compliance with 192.614 & 192.615	11/1/2014	12/31/2014	January 2015	Complete

If required, update procedural documentation/manuals	1/1/2015	3/31/2015	February 2015	Complete
Finalize revised Gas ERP	11/1/2014	12/31/2014	January 2015	Complete

Chapter VI – Project Management

Recommendation VI-1

Address deficiencies identified in the Project Management group's adherence to the Playbook project documentation requirements. This should include:

- Update the Project Management Documentation Policy to identify the requirements and responsibilities for records management on project-managed projects
- Continue periodic audits of project files by Internal Audit or an external auditor.

Implementation Leads

<i>Executive Sponsor:</i>	Cedric Williams, VP – Project Management & Complex Construction Gas Robert DeMrinis, VP – Maintenance & Construction (NY Gas)
<i>Team Lead(s):</i>	Timothy Moore, Director - Gas Project Management

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

Schedule

The Project Management Documentation Policy/Playbook was updated to include an audit schedule, supervisory control mechanisms and performance objectives in 2015.

Chapter VI – Project Management

Recommendation VI-2

Develop an estimating program for gas projects that is consistent with that used for NG USA's electric utilities.

Implementation Leads

<i>Executive Sponsor:</i>	Ross Turrini, SVP – Network Strategy
<i>Team Lead(s):</i>	Thomas Bennett, VP – Gas System Engineering Arthur Paul, Director – Project Engineering & Design

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Pending Review

National Grid is developing a Gas Estimating Department (*i.e.*, Estimating Center of Excellence or ECoE) within the Gas Systems Engineering Organization. This new group will support development of a consistent estimating end-to-end process including documentation of responsibilities and KPI's to measure performance. The scope of the Gas ECoE will include complex capital projects, as defined by the Gas Project Engineering & Design Playbook. This work includes, but is not limited to, pressure regulating stations, transmission pipeline projects, and bridge crossings. The number of projects this group will manage on an annual basis is estimated to be approximately 400 – 450 projects.

The Commission's May 19, 2016 Order in Case 15-M-0744 implemented a new gas estimating metric for NMPC, which will track and measure the Company's performance in this area. In response, Gas Project Estimating adjusted its scope, and staffing plan, to support non-complex project estimates that are now subject to the new estimating metric. The Company has hired five estimating employees to support the New York operating companies.

Gas Project Estimating has developed a charter and process documents for the department. A major revision to the gas estimating tool has been reviewed and completed, and the new version of the estimating tool was rolled out in 2016. Gas Project Estimating is currently performing project variance analysis and FY18 project estimating. **(Updated January 2017)**

Schedule

Major Activities	Estimated Completion Date (Updated)	Actual Completion Date	Current Status
Phase I - Establish Gas ECoE Group Charter Development End-to-End Estimating Process Review PE&D Playbook Review/Update RACI Development Staffing Department	Q1 – 2016	10/31/16	Complete
Phase II - ECoE Capability Build Estimator Training Estimating Tool Evaluation Estimating Tool Enhancements and Maintenance Future ECoE Estimating Software Review and Evaluation	Q3 – 2016	9/26/16	Complete
Phase III – Estimating Process Benchmarking Variance Analysis – FY16 Projects	Q3 – 2016	11/1/16	Complete
Phase IV - Implementation FY18 Projects Estimating KPI Tracking / Reporting Established	Q4 – 2016	11/14/16	Complete

Chapter VI – Project Management

Recommendation VI-3

Implement a WBS system to organize and manage gas projects as part of the implementation of Primavera P6.

Implementation Leads

<i>Executive Sponsor:</i>	Cedric Williams, VP – Project Management & Complex Construction Gas Robert DeMarinis, VP – Maintenance & Construction (NY Gas)
<i>Team Lead(s):</i>	William Kern, Manager – Long Term Resource Planning Timothy Moore, Director - Gas Project Management

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Pending Review

National Grid has implemented Primavera’s project management tool into the Gas organization. All complex gas projects have been built into Primavera.

Schedule

Major Activities	Estimated Completion Date	Actual Completion Date	Current Status
Create Gas Project Templates	January 2015	July 2015	Completed
Establish a Gas Library (Codes, Roles/Resources)	March 2015	August 2015	Completed
Build Pilot gas Projects into P6 <ul style="list-style-type: none"> Review logic and template for accuracy 	August 2015	August 2015	Completed
Training	May 2015	August 2015	Completed
Build remaining project managed gas projects into P6	August 2015	August 2015	Completed

Chapter VI – Project Management

Recommendation VI-4

Institute a process to track, monitor and report complex project status, including: budget variances, committed costs and actual costs to date, estimated cost at completion, projected year-end expenditures, schedule variance, pending and approved scope changes, and progress-to-date.

Implementation Leads

<i>Executive Sponsor:</i>	Cedric Williams, VP – Project Management & Complex Construction Gas Robert DeMarinis, VP – Maintenance & Construction (NY Gas)
<i>Team Lead(s):</i>	Timothy Moore, Director - Gas Project Management

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Pending Review

The Gas Project Management & Complex Construction organization has migrated all complex projects into the Primavera project management tool. This new tool will facilitate the tracking of schedules for project managed gas capital projects (discussed in the response to Recommendation VI-3).

Schedule

Major Activities	Estimated Start Date	Estimated Completion Date	Actual Completion Date	Current Status
Develop Complex Project Reports	3/01/15	12/31/15	March 2016	Completed
Schedule Monthly Complex Project Review Meetings	1/31/15	1/31/15	January 2015	Completed

Chapter VI – Project Management

Recommendation VI-5

Institute controls to ensure project change control logs are updated on a timely basis and that accurate change order information is contained in the Project Summary Reports. Include a review of the change order logs and the change order portion of the Project Summary Report as part of the periodic audits of project files recommended in Recommendation VI-1.

Implementation Leads

<i>Executive Sponsor:</i>	Cedric Williams, VP – Project Management & Complex Construction Gas
<i>Team Lead(s):</i>	Timothy Moore, Director - Gas Project Management

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

The Company has implemented various process improvements to ensure accurate recording of change controls for gas complex projects.

Schedule

The Company implemented the Project Management process improvements addressed in this recommendation in 2014.

Chapter VI – Project Management

Recommendation VI-6

Resolve data issues regarding the KPIs for materials services and the fleet metrics reports.

Implementation Leads

<i>Executive Sponsor:</i>	William Hilbrunner, Acting Vice President – Operations Support
<i>Team Lead(s):</i>	Craig Berlette, Director – Inventory Management

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

Inventory Management/Warehouse Management (IMWM) has completed its review of the Line and Order Fill Rate report as well as the Stock Availability report. Line and Order Fill Rate is now reported as a KPI and Stock Availability is used in reporting an Inventory Turns KPI. These KPIs are now fully implemented and no further action is required with regard to IMWM's KPIs.

Fleet KPIs include on-time completion of vehicle inspection reporting and performance of planned maintenance. These KPIs are now in place and no further action is required with regard to Fleet's KPIs.

Schedule

Completed.

Chapter VII – Work Management

Recommendation VII-1

Develop and implement, within the existing work management processes and systems, a program to track and manage crew and individual worker productivity.

Implementation Leads

<i>Executive Sponsor:</i>	Annette Saxman, VP – Gas Investment Resource and Rate Plan
<i>Team Lead(s):</i>	Patricia McVeigh - Director, Invest Planning Rate Case Support

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: In Progress

National Grid identified three major categories of work to fully implement this recommendation. First, the Company will need to develop a methodology to track non-productive work time. Second, the Company will need to link its systems to implement consistent and accurate reporting of productivity metrics. Third, as a longer term solution, the Company will need to refresh its mobile technology in the field for KEDNY and KEDLI, and deploy this technology for NMPC to implement productivity tracking.

Short Term Progress

The Company has developed daily and weekly individual worker productivity reporting for its Customer Meter Services function at the yard level. These reports measure and track individual worker productivity to the CMS business. Productivity metrics include:

Metric	Unit of Measure
Productive jobs per productive hours	Number of jobs
Shift start to onsite first job	Minutes
Average travel time per job	Minutes
Start Shift + Available + Idle + End of Day	Minutes
Last job to sign off/end of shift	Minutes
Minutes on job	Minutes
Unable To Complete (UTC) Rate	% of jobs

This methodology will be used to monitor productivity for major categories of Capital and O&M work.

The Company has also dedicated new Process and Performance personnel/resources focused on tracking and analyzing the Company's gas capital expenditures. Among other initiatives, this group will help develop more robust productivity reporting/metrics in the construction area.

At the same time, the Company is developing a methodology for tracking productivity/efficiency through an analysis of unit costs at the region (*e.g.*, upstate/downstate) and yard levels. Once developed, this unit cost data will be used to measure productivity and efficiency for main replacements and other construction work at the region/yard level.

For the longer term solution, the Company is completing the first phase of a multi-year business transformation program. This program will replace the core work and asset management systems with new, modern day applications. The benefits are reduced operational risk, improvements in compliance performance, as well as enhancing the customer experience. Additionally, the new solutions will support standardization of business processes that will drive improvements through enhanced visibility of the work with more efficient scheduling.

Implementation Plan Update

In November 2016, the Company filed a notice to update the Implementation Plan with regard to the deliverable and schedule for implementing this recommendation. Specifically, the Company proposed to modify its Implementation Plan to extend by six months (October 2017) the timeline for fully implementing the short term solutions for these recommendations. **(Updated January 2017)**

Schedule

National Grid estimates that the near-term implementation plans will be phase in by October 2017.

Chapter VII – Work Management

Recommendation VII-2

Develop a manpower planning program.

Implementation Leads

<i>Executive Sponsor:</i>	Annette Saxman, VP – Gas Investment Resource and Rate Plan,
<i>Team Lead(s):</i>	Patricia McVeigh - Director, Invest Planning Rate Case Support

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: In Progress

The ability to estimate the hours and costs associated with a work plan will improve the Company's manpower planning. The system enhancements set forth in the implementation plan for recommendation VII-1 may provide accurate productivity metrics, which can be used to improve the Company's manpower planning capabilities. Once the solution for recommendation VII-1 has been implemented, the Company will update its current excel-based work planning tools to address recommendation VII-2.

The implementation timeline for Recommendation VII-2 is consistent with the implementation of Recommendation VII-1, with short term deliverables currently expected to be place by October 2017.

Chapter VIII – Load Forecasting

Recommendation VIII-1

Establish a process to retain day-ahead forecasts of send out volumes, and of weather and other input assumptions for each of the operating companies. On a regular basis, conduct comparisons of forecast to actual send out volumes under forecast and actual weather conditions. Develop a process for assessing and reporting on the performance of the day-ahead model.

Implementation Leads

<i>Executive Sponsor:</i>	James Cross, VP – Customer Analytics & Risk Management
<i>Team Lead(s):</i>	Theodore Poe, Jr, Manager – Gas Forecasting & Analysis Elizabeth Arangio, Director – Gas Supply Planning Thomas Amerige, Director – Gas Control and Meter Data Services

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

The Company is capturing the daily results of its day-ahead forecast. Additionally, the Analytics group has implemented a newer high-dimensional data analysis and forecasting routine that is being tested side-by-side with the existing forecast.

Schedule

Gas Control, in consultation with the Gas Supply Planning and Analytics, Modeling and Forecasting groups, will continue to enhance its framework for day-ahead forecasting that will address these requirements. (Completed)

Chapter VIII – Load Forecasting

Recommendation VIII-2

Re-evaluate the residential forecasting model to identify opportunities to improve accuracy in forecasting during warm winters and to reduce variations from year to year in forecast results.

Implementation Leads

<i>Executive Sponsor:</i>	James Cross, VP - Customer Analytics & Risk Management
<i>Team Lead(s):</i>	Theodore Poe, Jr., Manager – Gas Forecasting & Analysis

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

The Company reviewed its residential forecasts for the New York Operating Companies as part of its annual planning cycle, updated its historical data to capture the most recent residential behavior, and is currently monitoring the data during this winter season.

Schedule

This review will take place over the next four to six months and is being factored into the 2015 Q2 Gas Load forecasting cycle. (Completed)

Chapter VIII – Load Forecasting

Recommendation VIII-3

Due to the complexity of the forecasting platform, improve reporting of forecast results and model performance on a level that is easily understood by upper management, internal customers and users, and outsiders. Examples include forecasts of number of customers by rate class, sales by rate class, separate reporting of firm vs non-firm customers, and reporting accuracy.

Implementation Priority: Low

Recommendation Accepted: Yes

Implementation Leads

<i>Executive Sponsor:</i>	James Cross, VP – Customer Analytics & Risk Management
<i>Team Lead(s):</i>	Theodore Poe, Jr., Manager – Gas Forecasting & Analysis

Current Status: Pending Review

The Company developed output reports from the Gas Load Forecasting process that can be easily understood by the various parties reviewing the forecast results. In 2015, an executive summary for management was developed and circulated. This report will now be part of the annual forecasting process.

Schedule

The Analytics, Modeling and Forecasting enhanced reporting format will be completed by the end of 2015. (Completed)

Chapter VIII – Load Forecasting

Recommendation VIII-4

Analyze the treatment of energy efficiency goals in the sales, send out and design day forecasting processes and models to identify opportunities to improve accuracy and minimize impacts of over-forecasting future savings. In collaboration with PSC staff, determine an appropriate approach for handling energy efficiency program goals and achieved savings in future modeling.

Implementation Leads

<i>Executive Sponsor:</i>	James Cross, VP – Customer Analytics & Risk Management
<i>Team Lead(s):</i>	Theodore Poe, Jr., Manager – Gas Forecasting & Analysis

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: Pending Review

Implementation of this recommendation requires the Company to work with internal parties and DPS Staff to explore options for handling treatment of energy efficiency program results and goals in the forecasting process, including investigating the impact of non-achievement of savings on gas procurement decisions.

In March 2015, the Company and Staff discussed whether the Company should consider the full impact of its energy efficiency goals (or some portion of the goals based on the Company's historic success rate) in the peak day gas forecast. The parties acknowledged that, by including the full amount of the efficiency goals, the Company could be understating its resulting peak day gas resource requirements. Accordingly, it was agreed that the Company will not deduct any impact for its energy efficiency goals over and above the success rate in its 2015 Q2 Gas Load Forecasting cycle.

The Company subsequently presented its plan to better address EE goals in the models at the annual Winter Supply review.

Schedule

Completed.

Chapter IX – Supply Procurement

Recommendation IX-1

Modify policies and procedures regarding the documentation and approval for the procurement of long-term supply and delivery commitments (longer than one year).

Implementation Leads

<i>Executive Sponsor:</i>	John Vaughn, VP – Energy Procurement Chris McConnachie, VP – US Treasury
<i>Team Lead(s):</i>	John Allocca, Director – Gas Contracting and Compliance Elizabeth Arangio, Director – Gas Supply Planning Alex Zhukovsky, Director – Quantitative Risk & Financial Reporting

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: In Progress

The Company has implemented the following improvements in this area:

1. Energy Procurement will document policies and procedures: The Company has reviewed and revised, as appropriate, its *Energy Procurement FERC Compliance & Contracting Standard Operating Procedures* to address this recommendation. **Completed. (Updated January 2017)**
2. Middle Office to finalize the EPRMC process: Completed.
3. Energy Procurement to comply with documented policies and procedures: Compliance with policies and procedures will begin immediately following finalization of the policies and procedures.
4. Middle Office to hold EPRMC meetings and provide support: Completed. EPRMC will meet at least once per month.

Chapter IX – Supply Procurement

Recommendation IX-2

As part of the annual gas supply plan submitted to the PSC, or in a separate filing, specifically document the five-year supply/demand balance and capacity plans. For capacity contracts that are up for renewal during the five-year planning horizon, provide a discussion of the current expectations regarding those plans. If the long-term supply portfolio review, including contracts not expected to be renewed, shows the need for new capacity to meet design day requirements, provide information on options being explored. Update information provided in previous plans regarding new capacity and capacity renewals.

Implementation Leads

<i>Executive Sponsor:</i>	John Vaughn, VP – Energy Procurement
<i>Team Lead(s):</i>	Elizabeth Arangio, Director – Gas Supply Planning Marybeth Carroll and Robert Moore, Managers – Gas Supply Planning

Implementation Priority: Medium

Recommendation Accepted: Yes

Proposal to Implement Recommendation

Current Status: Implemented

The Company initially met with Staff to discuss the five-year supply/demand balance and capacity information to be included in its annual gas supply reporting. The Company subsequently included this information in its response to Question 6 of the 2015-16 National Grid Winter Supply Review (Case 15-G-0213) and will continue to do so in future winter supply reviews.

National Grid is transitioning to a ten-year forecast and planning horizon, which will better position the Company to make long-term supply decisions, including the need for pipeline projects that require significant lead time to be placed in service.

The Company's Energy Procurement team met with DPS Staff on September 10, 2015 to present the status of each of the Audit Report recommendations for Chapter IX.

Schedule

Complete

Chapter IX – Supply Procurement

Recommendation IX-3

Add a representative from the Energy Procurement group to the NY Leadership Team as a regular full participant.

Implementation Leads

<i>Executive Sponsor:</i>	Ken Daly, President – New York Jurisdiction
<i>Team Lead(s):</i>	Elizabeth Arangio, Director – Gas Supply Planning

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Implemented

The Vice President of Energy Procurement joined the NY Leadership Team as of October 2014. The Vice President of Energy Procurement is responsible for both gas and electric procurement in New York and represents the energy/supply procurement functions for the gas and electric businesses on the NY Leadership Team.

Schedule

This recommendation has been implemented and is complete.

Chapter IX – Supply Procurement

Recommendation IX-4

Modify policies and procedures covering the monthly and daily procurement forecasting and “set up” processes for each of the operating companies.

Implementation Leads

<i>Executive Sponsor:</i>	John Vaughn, VP – Energy Procurement
<i>Team Lead(s):</i>	Elizabeth Arangio, Director – Gas Supply Planning Marybeth Carroll and Robert Moore, Managers – Gas Supply Planning

Implementation Priority: Low

Recommendation Accepted: Yes

Current Status: In Progress

The Company is enhancing its policies and procedures consistent with the recommendation, including hiring an additional FTE responsible for all analysis associated with daily and monthly setup plans and look-back review of plans based on actual weather and actual sendout.

Schedule

1. Hiring of FTE: The Company has hired a new FTE who will be responsible for analyzing and reviewing daily and monthly setup plans. **Completed (Updated January 2017).**
2. Consultations with Gas Control & Load Forecasting: Dependent on implementation of Recommendation VIII-1. **Completed.**
3. Development of new spreadsheet for daily and monthly set up for both DNY and UNY; the Company expects to develop and utilize new spreadsheets for daily and monthly set-up within the next three months. **Completed.**
 - The new Downstate NY spreadsheet has been in use since May 2015. The spreadsheet for Upstate NY is under development and will be in use no later than November 2015.
 - Gas Supply Planning, in conjunction with the development of its new spreadsheets, is now saving both the day-ahead setup, intraday setup, and final setup.
 - Gas Control is now retaining weather data and load forecasts for the same intervals.

4. Documentation of daily and monthly parameters/objectives/guidelines:
The Company expects to complete documentation of daily and monthly parameters within the next five to six months. **Completed.**
5. Schedule quarterly reviews for daily forecast and daily set-up plans:
Dependent on implementation of Recommendations VIII-1 and 2.
(Completed)
 - The Company has conducted four review meetings to date (two in 2015, two in 2016); two more are scheduled in 2016.

Chapter IX – Supply Procurement

Recommendation IX-5

Develop a gas supply performance review process, including a monthly metrics scorecard and associated reporting that assesses the overall performance of the Energy Procurement group in managing the gas supply portfolio.

Implementation Leads

<i>Executive Sponsor:</i>	John Vaughn, VP – Energy Procurement
<i>Team Lead(s):</i>	John Allocca, Director – Gas Contracting and Compliance Elizabeth Arangio, Director – Gas Supply Planning Mark Leippert, Director – Wholesale Gas Supply Steve McCauley, Director – Origination and Price Volatility Management Alex Zhukovsky, Director – Quantitative Risk & Financial Reporting

Implementation Priority: Medium

Recommendation Accepted: Yes

Current Status: Pending Review

The Company has developed four performance metrics for the gas supply function:

1. On an annual basis, the Company will forecast Gas Off-System Sales (OSS) Customer Savings Targets for Downstate NY and Upstate NY and measure actual performance against these targets.
2. The Company will provide a measure of the volatility of the hedge portfolio relative to the overall volatility in the natural gas markets.
3. The Company will provide a metric of supply cost as a ratio of the actual gas costs to a theoretical cost. The Company will compare the monthly ratio to the 12 month rolling average of the ratio.
4. The Company will provide a metric of the actual weighted average purchase cost compared against the weighted average market cost for gas purchases executed for the Downstate NY and Upstate NY gas customers.

Schedule

The Company's Energy Procurement team met with DPS Staff in September 2015 to present its implementation plans for the Audit Report recommendations for Chapter IX. The Company has updated the metrics based on feedback from that meeting, and the metrics are now in use.

Chapter IX – Supply Procurement

Recommendation IX-6

Conduct a thorough investigation of the allocation and assignment of costs, particularly labor costs, from Energy Procurement to the NY gas utilities to identify the reasons for the NY Gas utilities receiving an apparent disproportionate share of costs. Verify that costs charged to the NY gas utilities by other parts of the Customer functional areas, including the Analytics Modeling and Forecasting group that prepares the forecasts used for gas supply planning and procurement, and are appropriate and supportable. Modify cost assignments, time reporting and allocation procedures to resolve any identified inconsistencies. Document the results of the investigation and resulting recommendations to the PSC within six months.

Implementation Leads

<i>Executive Sponsor:</i>	John Vaughn, VP – Energy Procurement David Doxsee, Vice President – Finance (New York)
<i>Team Lead(s):</i>	Mark Leippert, Director – Wholesale Gas Supply Theodore Poe, Jr., Manager – Gas Forecasting & Analysis

Implementation Priority: High

Recommendation Accepted: Yes

Current Status: Pending Review

The Company performed a detailed review of non-gas operating expenses of the Energy Procurement group as well as the Analytics Modeling and Forecasting group. The Company submitted its final report to staff on June 24, 2015.

Schedule

Completed

Chapter XI – Performance Management

Recommendation XI-1

With the FY 2016 planning cycle (beginning in FY15), modify the performance management process to replace Elevate 2015 and better align NG-plc, NGUSA, NY jurisdiction, and NY Operating Company goals and objectives with a more robust set of performance metrics. The revised performance management program should address/include the following:

- NG-plc, US, NY and operating company priorities should be aligned but reflect individual priorities.
- All priorities and strategies should have defined performance measures and targets and be reported monthly, at a minimum. Ideally metrics would be at the jurisdiction and operating company level in addition to the US level. Gaps such as those illustrated in Exhibit XI-5 (of the Audit Report) should not exist.
- Metrics should include leading indicators and should be used to monitor performance and address performance issues.
- The revised SLAs performance measures should be included in the performance management system.
- Operating and process improvement team metrics should continue to be robust and not driven to the minimal level of aggregate detail currently represented by Elevate 2015.
- NY Jurisdictional performance should be routinely reported at an operating company level, and should include SLA performance.
- Any construct developed to communicate the Line of Sight to employees such as Elevate 2015 should be clearly defined, easy to communicate, tie to the NY/operating company objectives/priorities and be supported by metrics that actually measure performance against the stated ambition or objective.

Employee performance evaluation objectives and measures should:

- Be defined and objective.
- Involve quantified performance targets, wherever possible, and milestones or specific deliverables.
- Reflect US goals and objectives, NY, operating company and business unit priorities, along with relevant SLA targets.
- Consider the employee's job function and include performance objectives related to that job function.
- Not be artificially tied to broader US ambitions that are not as applicable to the employee's job.
- Include a manageable set of performance requirements. Too many performance requirements make objective performance measurement difficult and can result in a loss of focus.
- Provide objective explanations as to how various performance objectives are weighted or used in the rating determination.

Implementation Leads

<i>Executive Sponsor:</i>	Ken Daly, President – New York Jurisdiction
<i>Team Lead(s):</i>	Keri Sweet Zavaglia, Vice President – NY Performance & Strategy

Implementation Priority: Medium**Recommendation Accepted:** Yes (with modifications)**Current Status:** Pending Review

National Grid is committed to ensuring that the US priorities are designed to achieve the National Grid plc vision. For FY 2017, National Grid developed its Elevate 2018 strategy, which sets forth National Grid's ambitions and priorities and provides the framework for measuring performance. As discussed in the Audit Report, Elevate 2018 connects the Company's ambitions, priorities, metrics, SLAs, jurisdictional model, and business plans to provide clear alignment among NG plc, NG USA and the New York operating companies.

The US objectives were established by the jurisdictions based on key performance measures. The objectives represent the specific actions required to achieve the performance measures, thereby increasing clarity among employees of their role in delivering the objectives. By design, the New York operating companies' priorities are consistent with the US priorities and more specific.

In addition, consistent with NorthStar's recommendation, National Grid is strengthening its employee performance evaluation P4G processes. Discussions with senior leadership and the materials presented to managers across the organization clarified that employee objectives and measures of success must, among other items, (i) reflect US objectives, NY, operating company and business unit priorities, along with relevant SLA targets; (ii) consider the employee's job function and include performance objectives related to that job function; (iii) not be artificially tied to broader US ambitions that are not as applicable to the employee's job; and (iv) provide objective explanations as to how various performance objectives are weighted or used in the rating determination.

See the Company's response to Recommendations IV-2 and XI-2 regarding enhancements to the performance management process.

Schedule

Major Activities/ Milestones	Estimated Completion Date	Actual Completion Date	Status
Establish FY16 Objectives and Metrics	April 2015	Completed – FY16/17	Pending Review

Testimony of Keri Sweet Zavaglia

Exhibit __ (KSZ-3)

Implementation Status of Each Management Audit Recommendation

(March 29, 2017)

**Implementation Status — Individual Recommendations
(As of March 29, 2017)**

Chapter	#	Recommendation	Implementation Status
III	1	Reconstitute the NG USA Board of Directors.	Implemented
III	2	Reconstitute the Boards for KEDLI, KEDNY and NMPC.	Implemented
III	3	Continue to evolve the Jurisdictional organization model.	Implemented
III	4	Establish a Chief Risk Officer within NG USA.	Implemented
III	5	Prepare true strategic plans for National Grid’s New York operations.	Implemented
III	6	Investigate the cost impacts of the LIPA separation.	Implemented
IV	1	Prepare a report that fully documents costs associated with USFP.	Implemented
IV & XI	2	Continue to evolve the Service Level Agreements.	Implemented
V	1	Develop an integrated natural gas system-wide plan.	Pending Review
V	2	Update the Company’s Integrity Management Plan (IMP) to comply with § 192.911.	Pending Review
V	3	Update procedural documentation/manuals to comply with § 192.614 and § 192.615.	Pending Review
VI	1	Address deficiencies to the Playbook project documentation requirements.	Pending Review
VI	2	Develop an estimating program for gas projects.	Pending Review
VI	3	Implement a WBS system to organize and manage gas projects.	Pending Review
VI	4	Institute a process to track, monitor and report complex project status, including budget variances, committed costs and actual costs to date, estimated cost at completion, projected year-end expenditures, schedule variance, pending and approved scope changes, and progress-to-date.	Pending Review
VI	5	Institute controls to ensure the project change control logs are updated on a timely basis.	Pending Review
VI	6	Resolve data issues regarding the KPIs for materials services and the fleet metrics reports.	Pending Review

Chapter	#	Recommendation	Implementation Status
VII	1	Develop and implement, within the existing work management processes and systems, a program to track and manage crew and individual worker productivity.	In Progress
VII	2	Develop a manpower planning program.	In Progress
VIII	1	Retain day-ahead forecasts of send out and weather and other input assumptions, and conduct comparison of forecast to actual send out.	Implemented
VIII	2	Re-evaluate the residential forecasting model to identify opportunities to improve accuracy in forecasting during warm winters and to reduce variations from year to year in forecast results.	Implemented
VIII	3	Due to the complexity of the forecasting platform, improve reporting of performance on a level that is easily understood by upper management and outsiders.	Implemented
VIII	4	Analyze the treatment of energy efficiency goals in the sales, send out and design day forecasting processes and models.	Implemented
IX	1	Modify policies and procedures regarding the procurement of long-term supply and delivery commitments (longer than one year).	Pending Review
IX	2	As part of the annual gas supply plan submitted to the PSC, document the five-year supply/demand balance and capacity plans.	Implemented
IX	3	Add a representative from the Energy Procurement group to the NY Leadership Team.	Implemented
IX	4	Modify policies and procedures covering the monthly and daily procurement forecasting and “set up” processes for each of the operating companies.	Pending Review
IX	5	Develop a gas supply performance review process.	Implemented
IX	6	Conduct a thorough investigation of the allocation and assignment of costs from Energy Procurement to the NY gas utilities.	Pending Review
X		No recommendation	N/A
XI	1	Modify the performance management process to replace Elevate 2015 and better align NG-plc, NG USA, NY jurisdiction, and NY Operating Company goals and objectives.	Pending Review

Testimony of
Information Services Panel

Before the Public Service Commission

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID

Direct Testimony

of

Information Services Panel

Dated: April 28, 2017

Testimony of the Information Services Panel

Table of Contents

I.	Introduction and Qualifications	1
II.	Purpose of Testimony	9
III.	Services Provided by National Grid IS	9
IV.	IS Costs in the Historic Test Year and Rate Year Investment Goals.....	16
V.	Rate Year IS Capital Projects and Initiatives.....	20
	A. Technology Modernization	22
	B. System Modernization.....	25
	C. Cyber Security	32
	D. Physical Security	38
	E. Human Resources (“HR”) Simplification System	41
	F. DG Customer Information System (“CIS”) Solution	44
VI.	Rate Year IS Operating Costs	45

Testimony of the Information Services Panel

1 **I. Introduction and Qualifications**

2 **Q. Please introduce the members of the Information Services (“IS”)**
3 **Panel.**

4 A. The Panel consists of Anuraag Bhargava, Daniel J. DeMauro, Mukund
5 Ravipaty, and Aman S. Aneja.

6
7 **Q. Mr. Bhargava, please state your name and business address.**

8 A. My name is Anuraag Bhargava. My business address is 40 Sylvan Road,
9 Waltham, Massachusetts 02451.

10

11 **Q. By whom are you employed and in what capacity?**

12 A. I am employed by National Grid USA Service Company, Inc. (“National
13 Grid Service Company”), a subsidiary of National Grid USA (“National
14 Grid”), and currently hold the position of Senior Vice President and U.S.
15 Chief Information Officer. My responsibilities include leading and
16 continuously improving the performance of the IS organization,
17 overseeing internal IS workforce development, and partnering with the
18 business to develop, build, and implement new technologies and IS
19 strategies to support business initiatives and customer needs.

20

Testimony of the Information Services Panel

1 **Q. Please describe your educational background and business**
2 **experience.**

3 A. I received a Bachelor of Science in Mechanical Engineering from G.B.
4 Pant University in Pantnagar, India in 1992, and a Master of Business
5 Administration from Carnegie Mellon University in Pittsburgh,
6 Pennsylvania in 2000. From 1992 to 1998, I served as Senior Project
7 Engineer and Department IT Head for Larsen & Tourbro, an engineering
8 and construction firm, where I was responsible for the chemical, petro-
9 chemical, and cryogenics engineering departments. From 1999 to 2008, I
10 served as a Principal in the strategy practice group at global management
11 consulting firm, A.T. Kearney, Inc. As a Principal, I provided consulting
12 services related to corporate strategy, IT, supply chain, engineering, and
13 design to Fortune 500 companies. From 2008 to 2011, I served as Vice
14 President and Chief Information Officer at Electro-Motive Diesel, a diesel
15 locomotive manufacturing corporation. Specifically, I was responsible for
16 Electro-Motive Diesel's global supply chain and Information Technology
17 ("IT") organizations, and led many global corporate strategic initiatives.
18 From 2011 to 2014, I served as the Chief Operating Officer and Board
19 member for PeopleGuard LLC, a subsidiary of LakeEffect Ventures LLC,
20 which provided global security products and services. From 2011 to 2016,
21 I also served as Partner and Chief Technology Officer of LakeEffect

Testimony of the Information Services Panel

1 Ventures LLC, an equity group with worldwide interests in retail,
2 manufacturing, railroads, and mining. In May 2016, I joined National
3 Grid as Senior Vice President and U.S. Chief Information Officer, which
4 is my current role.

5

6 **Q. Mr. DeMauro, please state your name and business address.**

7 A. My name is Daniel J. DeMauro. My business address is 300 Erie
8 Boulevard West, Syracuse, New York 13202.

9

10 **Q. By whom are you employed and in what capacity?**

11 A. I am employed by National Grid Service Company, and currently hold the
12 position of Director, IS Regulatory. My current responsibilities include
13 oversight of IS activities in regulatory proceedings for all of National
14 Grid's New York electric and gas distribution operations, including
15 Niagara Mohawk Power Corporation ("Niagara Mohawk" or the
16 "Company").

17

18 **Q. Please describe your educational background and business**
19 **experience.**

20 A. I graduated from LeMoyne College in Syracuse, New York in 1983 with a
21 Bachelor of Science in Accounting. In 1986, I joined Niagara Mohawk as

Testimony of the Information Services Panel

1 an Accountant. In 1991, I became Plant Accounting Manager after
2 holding several other positions in the financial accounting department for
3 Niagara Mohawk and its successor company, National Grid. In 2006, I
4 became Director, Internal Audit U.S., for National Grid Service Company.
5 From 2007 through 2015, I held several positions in the accounting
6 department, including Director – Finance Integration, Director – Balance
7 Sheet Integrity, and Accounting Program Director. In these roles, I had
8 direct involvement with a number of accounting processes within the
9 Company, including oversight of the Fixed Asset Accounting, Cash
10 Accounting, Account Reconciliations and Revenue Accounting work
11 teams (Director – Balance Sheet Integrity). I was promoted to my current
12 position in January 2016.

13
14 **Q. Have you previously testified before a regulatory commission?**

15 A. Yes. I recently testified in a rate proceeding before the Massachusetts
16 Department of Public Utilities on behalf of the Massachusetts Electric
17 Company and Nantucket Electric Company, subsidiaries of National Grid.
18 This is my first time testifying before the New York State Public Service
19 Commission (“Commission”).
20

Testimony of the Information Services Panel

1 **Q. Mr. Ravipaty, please state your name and business address.**

2 A. My name is Mukund Ravipaty. My business address is 40 Sylvan Rd,
3 Waltham, Massachusetts 02451.

4
5 **Q. By whom are you employed and in what capacity?**

6 A. I am employed by National Grid Service Company, and currently hold the
7 position Director, Global Head Security Services, Design & Architecture.
8 My responsibilities include oversight of the development of cyber security
9 strategy and architecture to ensure National Grid cyber and security
10 protections are developed to keep pace with evolving threats, thereby
11 enabling and supporting resilient business operations and customer
12 service.

13

14 **Q. Please describe your educational background and business**
15 **experience.**

16 A. I received a Bachelor of Science in Computer Science from Andhra
17 University in India in 1998. I am currently pursuing a Master of Business
18 Administration at the Massachusetts Institute of Technology Sloan School
19 of Management. I have over 20 years of professional experience focused
20 exclusively on cyber security. Prior to National Grid, I worked across
21 multiple information security domains (e.g., security and risk

Testimony of the Information Services Panel

1 management, asset security, security assessment and testing, and identity
2 and access management) within the outsourcing, local government,
3 banking, utilities, telecoms, and new media and internet sectors.

4

5 **Q. Mr. Aneja, please state your name and business address.**

6 A. My name is Aman S. Aneja. My business address is 175 East Old
7 Country Road, Hicksville, New York 11801.

8

9 **Q. By whom are you employed and in what capacity?**

10 A. I am employed by National Grid Service Company, and currently hold the
11 position of Director, IS Relationship Management. My responsibilities
12 include providing overarching direction to the business and IS team to
13 manage demand and leverage IS technology to meet business goals and
14 objectives; monitoring the progress of IS delivery services to ensure
15 expected deliverables and results; and ensuring that key IS project risks
16 and issues are identified and addressed. I currently support the following
17 functions: Customer, U.S. Control Center Operations, Federal Energy
18 Regulatory Commission Jurisdiction, and Electric Systems Engineering.

19

Testimony of the Information Services Panel

1 **Q. Please describe your educational background and business**
2 **experience.**

3 A. In 1999, I received a Bachelor of Science in Computer Science from St.
4 John's University with a minor in Business. Prior to National Grid, I was
5 employed as Manager, Business Continuity Crisis Management, at
6 Goldman Sachs. I joined National Grid as a contract Project Manager in
7 February 2009. In September 2010, I joined National Grid as a full-time
8 employee in the position of Business Support Manager for Global Head of
9 Business Relationship Management. Between 2010 and 2014, I held
10 various positions in IS. In February 2014, I was promoted to Director, IS
11 Relationship Management, and have served in this role for the last three
12 years.

13

14 **Q. Does the Panel sponsor any exhibits as part of its testimony in this**
15 **proceeding?**

16 A. Yes. The Panel sponsors the following exhibits that were prepared or
17 compiled under our supervision and direction:

18 (i) Exhibit __ (ISP-1) presents the allocation codes used to determine
19 the forecast annual rent expense to Niagara Mohawk for IS
20 projects in the Rate Year (the twelve months ending March 31,
21 2019), Data Year 1 (the twelve months ending March 31, 2020),

Testimony of the Information Services Panel

- 1 and Data Year 2 (the twelve months ending March 31, 2021) (Data
2 Year 1 and Data Year 2 are collectively the “Data Years”);
- 3 (ii) Exhibit __ (ISP-2) presents the operating expenses incurred by
4 Niagara Mohawk for IS during the twelve months ended December
5 31, 2016 (“Historic Test Year”);
- 6 (iii) Exhibit __ (ISP-3) presents the IS capital projects and investments
7 planned for the Rate Year and Data Years;
- 8 (iv) Exhibit __ (ISP-4) summarizes the IS Technology Modernization
9 projects and customer benefits in the Rate Year and Data Years;
- 10 (v) Exhibit __ (ISP-5) summarizes National Grid’s cyber security IS
11 projects from January 2017 through the Data Years;
- 12 (vi) Exhibit __ (ISP-6) summarizes National Grid’s cyber security
13 protections for system modernization.
- 14 (vii) Exhibit __ (ISP-7) details the incremental run the business costs
15 and project operating expenses comprising investment plan
16 operating costs by project for the Rate Year and Data Years; and
- 17 (viii) Exhibit __ (ISP-8) presents the IS operating expenses for the
18 Historic Test Year as well as for the Rate Year and Data Years.
19

Testimony of the Information Services Panel

1 **II. Purpose of Testimony**

2 **Q. What is the purpose of the Panel's testimony?**

3 A. The purpose of the Panel's testimony is to describe National Grid's IS
4 function, specifically as it relates to Niagara Mohawk. The Panel will
5 explain the services provided by IS and describe how IS proposes to
6 provide these services. The Panel will describe the major IS investments
7 and initiatives during the Rate Year and Data Years, including investments
8 in technology modernization, system modernization, cyber security,
9 physical security, and a human resources information system. Finally, the
10 Panel will discuss the operating costs that National Grid and Niagara
11 Mohawk will incur in the Rate Year and Data Years for IS services.

13 **III. Services Provided by IS**

14 **Q. What services does IS provide?**

15 A. IS provides, maintains, and manages the computer hardware, computer
16 software, cyber security, telecommunications and other related
17 infrastructure, systems, and services across all of National Grid's service
18 territories. IS delivers three primary categories of services:

- 19 • Development/Delivery Services – identifying new computer and
20 communication technology trends and developing relevant
21 innovative solutions for the business.

Testimony of the Information Services Panel

- 1 • Support and Maintenance Services – ongoing support for business
- 2 applications and infrastructure.
- 3 • End User Services – products and services such as desktop and
- 4 email services, collaboration services, communications media, and
- 5 printer/fax support.
- 6

7 **Q. Please explain IS's approach to service delivery.**

8 A. National Grid's IS delivery model utilizes external partners, each of which

9 performs a specific IS function. The specialized IS functions are as

10 follows:

- 11 • Application development and maintenance: full range of
- 12 application service, including development of new applications as
- 13 well as day-to-day support of existing applications;
- 14 • Internet, collaboration, and e-mail: email, web conferencing,
- 15 instant messaging and collaboration tools, such as SharePoint,
- 16 operated on vendor-owned and hosted infrastructure;
- 17 • Networks and communications: managed single network service
- 18 that consolidates National Grid's Local Area Network ("LAN"),
- 19 Wide Area Network ("WAN"), telephony, and video and audio
- 20 conferencing;

Testimony of the Information Services Panel

- 1 • Data center and client services/enterprise services: data center
2 services (*e.g.*, servers, data storage); management of hardware,
3 software, and storage located in data centers providing security,
4 back-up capability, and disaster recovery services; and client
5 services, such as the provision and support of end user devices
6 (*e.g.*, laptops), and deployment and maintenance of the operating
7 systems and applications that run on those devices;
- 8 • Managed print: managed support service for a refreshed and
9 standardized fleet of print devices enabling increased security for
10 printing, copying, faxing and scanning;
- 11 • Service management integrator: coordinates the activities of all the
12 vendor partners to ensure they work collaboratively for effective
13 end-to-end delivery of services and manage the Service/Help Desk,
14 to assist employees experiencing problems with technological
15 devices (laptops, desktops, mobile telephones, *et cetera*), having
16 difficulty accessing the National Grid network, or needing
17 assistance in performing a specific computing function.

18

Testimony of the Information Services Panel

1 **Q. Please describe how IS identifies the projects and investments**
2 **necessary to serve Niagara Mohawk's customers.**

3 A. National Grid annually identifies investments that will be required over
4 the next three years. IS Business Relationship Managers work closely
5 with functional leadership and the jurisdictional presidents on an ongoing
6 basis to determine the IS needs of the business and the cost and timing for
7 the required investments. The investments are then prioritized against
8 overall expenditure targets. Project development follows a sanctioning
9 process for all U.S. IS investments.

10

11 **Q. How are the costs of IS projects and investments assessed to Niagara**
12 **Mohawk?**

13 A. IS capital projects and investments that are shared investments across
14 operating companies are implemented and owned by National Grid
15 Service Company, and allocated to Niagara Mohawk in the form of an
16 annual rent expense. Exhibit __ (ISP-1) provides the allocations utilized
17 to determine the forecast annual rent expense for the IS projects planned
18 for the Rate Year and Data Years.

19

Testimony of the Information Services Panel

1 **Q. How are the costs of IS capital projects amortized?**

2 A. The amortization period is determined by plant accounting rules that are
3 specific to each type of asset, and applied based on the replacement cycle
4 for the particular asset type. Recovery of hardware and equipment and
5 amortization of software intangible assets will approximate the useful life
6 of the new system, taking into consideration technological and functional
7 obsolescence and vendor support options. For example, based on
8 experience, National Grid typically amortizes software applications over
9 84 months reflecting expected releases of new versions by the vendor.
10 The exception is certain significant systems, such as SAP, which are
11 assigned a ten year life.

12
13 Assuming an asset is not prematurely retired, it would be retired when it is
14 fully recovered and the amortization expense (and thus the resulting rent
15 expense allocation from National Grid Service Company to the Company)
16 would cease at that point. In the rare instance where a software intangible
17 asset is impaired or otherwise prematurely retired before it is fully
18 recovered, the net book value of the asset is written off to expense and the
19 amortization expense would cease at that point. The write off expense is
20 charged to the Company using the same allocation percentages as the asset
21 was deployed for the benefit of the Company in the first place.

Testimony of the Information Services Panel

1 **Q. How does National Grid determine whether to purchase systems from**
2 **a third-party vendor as opposed to developing systems internally?**

3 A. During new software development, IS evaluates whether commercially
4 available vendor products are suitable for implementation as opposed to
5 developing and constructing the software internally. If vendor products
6 are deemed appropriate, both from a financial and practical perspective,
7 the Company enters into contracts to lease software as a service (“SaaS”)
8 from a vendor for specified period of time. The Company uses SaaS to
9 support various business needs and functions, such as recruitment,
10 employee management, development and training, finance, legal, and
11 regulatory. The Company currently has several SaaS contracts in place,
12 including Learning Link (an online training database for office and field
13 employees); DREAM (a web based docket management system used to
14 prepare and submit responses in regulatory proceedings); and the National
15 Grid Benefit Services Center (an online system for the administration of
16 healthcare and other employee benefits).

17
18 **Q. Please explain the benefits of SaaS.**

19 A. There are a number of customer benefits associated with SaaS, most
20 notably in terms of efficiency, cost effectiveness, accessibility, and
21 longevity. First, SaaS generally results in faster implementation because

Testimony of the Information Services Panel

1 the Company does not have to build IS infrastructure, but instead leases it
2 from third party providers that have already constructed and tested the
3 technology. The Company can also manage to a fixed budget over the
4 lease term rather than embark upon a potentially costly infrastructure
5 build. Under a SaaS approach, pursuant to the vendor contract, upgrades
6 and maintenance are typically the responsibility of the vendor, which
7 reduces the risk of obsolescence as well as the need to invest in major
8 program updates during the life of the contract. SaaS solutions can also be
9 more easily scaled for additional capacity as well as integrated with
10 existing solutions when required to enable growth. Finally, using SaaS
11 provides the Company with access to industry-leading expertise and
12 service levels when integrating the technology that may otherwise be
13 unavailable if the Company was implementing the technology on its own.

14

15 **Q. How are SaaS agreements treated for accounting and ratemaking**
16 **purposes?**

17 A. If National Grid prepays the cost for a fixed number of years, the expense
18 is amortized over the prepaid term and allocated to Niagara Mohawk as
19 rent expense. If National Grid does not prepay for the application, it treats
20 the costs as operating expense.

21

Testimony of the Information Services Panel

1 **Q. How do the services provided by IS benefit Niagara Mohawk and its**
2 **customers?**

3 A. IS services range from critical electric and gas transmission/distribution
4 support systems to standard office desktop applications. These services
5 underpin the safe, reliable, and secure physical and commercial operation
6 of Niagara Mohawk's electric and gas businesses. IS also provides a suite
7 of software applications that serves the needs of customers and allows for
8 the effective management and operation of Niagara Mohawk. National
9 Grid operates these applications on hardware systems that are centrally
10 located as well as distributed to employees in the form of personal
11 computers and other devices. IS also provides Niagara Mohawk with
12 asset and work management systems that provide the administrative
13 support required to manage electric and gas service.

14

15 **IV. IS Costs in the Historic Test Year and Rate Year Investment Goals**

16 **Q. What were Niagara Mohawk's IS costs for the Historic Test Year?**

17 A. Niagara Mohawk's IS costs for the Historic Test Year totaled \$103.8
18 million and consisted of \$73.1 million of operating expenses as set forth
19 on Exhibit __ (ISP-2) and \$26.3 million and \$4.3 million of service
20 company rents for the electric and gas businesses, respectively, as set forth

Testimony of the Information Services Panel

1 on Exhibit __ (RRP-11), the Workpapers to Exhibit __ (RRP-3), Schedule
2 9, Workpaper 1.

3
4 **Q. What are the goals of the IS capital investment and operating plans**
5 **for the Rate Year and Data Years?**

6 A. Substantial IS capital investment, as shown in Exhibit __ (ISP-3), is
7 needed for the Rate Year and Data Years to (i) address aged and
8 unsupported systems and infrastructure; (ii) reduce operational/cyber risk
9 and inefficiencies; (iii) support evolving customer and business demands,
10 and (iv) facilitate other key utility and market trends.

11

12 **Q. Please explain the significance of each of these goals.**

13 A. *Replacement of Aged and Unsupported Systems and Infrastructure*

14 Currently, IS manages a number of disparate and aged assets with varying
15 degrees of vendor support. IS must undertake significant investment
16 beginning in fiscal year (“FY”) 2018 to modernize aged technology and
17 infrastructure to maintain service levels, support day-to-day business
18 requirements, meet new business requirements, obtain necessary hardware
19 and required patches in the marketplace, and develop and test new IS
20 projects.

21

Testimony of the Information Services Panel

1 *Reduction in Operational/Cyber Risk and Inefficiencies*

2 A significant update to IS systems and technologies is required to reduce
3 the operational and cyber risk and inefficiencies resulting from the aged
4 technologies discussed above. Specifically, National Grid must address
5 the risks that existing systems may experience (i) unplanned downtime
6 disruptive to business operations; (ii) a lack of robust vendor support that
7 provides monitoring capability or resiliency to stop cascading failures; and
8 (iii) the inability to perform standard upgrades and rationalize and/or
9 remediate old applications.

10

11 *Meeting Evolving Customer and Business Demands*

12 Customers are increasingly interested in managing their energy
13 consumption, connecting with the Company on social media and other
14 interaction channels, accessing their energy usage data and analytics, and
15 using applications with more functionality and accessibility through
16 multiple devices, including mobile devices.

17

18 Similarly, employees, whether they are field workers, customer service
19 agents, or back office workers, are requiring increased connectivity
20 through multiple devices; the ability to relay real-time information in the
21 form of pictures, videos, and telemetry; greater opportunities for internal

Testimony of the Information Services Panel

1 and external collaboration; and access to increased bandwidth and cloud
2 services to improve customer service. At the same time, National Grid's
3 business units are demanding capabilities to support evolving business and
4 regulatory demands (e.g., system modernization and Utility of the Future
5 functionality).

6 7 *Addressing Other Key Utility and Market Trends*

8 Increased use and expectations on use of cloud computing and SaaS
9 solutions internally as well as by customers and business partners require
10 upgraded IS infrastructure. Fully supported and upgraded infrastructure
11 and software is also required to accommodate more sophisticated data
12 management and analytics platforms increasingly utilized in the market
13 and sought by customers and the business.

14
15 **Q. How does IS plan to address these strategic goals in the Rate Year and**
16 **Data Years?**

17 A. National Grid IS's approach to achieving these goals consists of (i)
18 significant infrastructure and application investments (with accompanying
19 operations and maintenance ("O&M") expenditures to develop the
20 solutions) over the next few years, including the Rate Year and Data
21 Years; and (ii) increased operational support and maintenance of IS

Testimony of the Information Services Panel

1 investments and vendor contracts, implementation of vendor sourcing
2 strategy activities, and refinements to its service delivery model to
3 establish strategic, internal expertise, support and capabilities to better
4 meet customer and business needs.

5 6 **V. Rate Year IS Capital Projects and Initiatives**

7 **Q. How are IS capital investments presented in these rate filings?**

8 A. Exhibit __ (ISP-3) lists the IS capital investment projects included in the
9 Rate Year and Data Years. The exhibit breaks out the projects by program
10 (e.g., cyber security, FY 2018 plan, NY REV/grid modernization projects,
11 Gas Business Enablement). Although a number of Company witnesses
12 discuss the need for various IS investments, the costs of all IS capital
13 investment projects included in the Rate Year and Data Years are
14 supported by this Panel and are included in Exhibit __ (ISP-3). Exhibit __
15 (RRP-3), Schedule 9, Page 7, to the Revenue Requirements Panel's
16 testimony further breaks out the IS investments reflected in these rate
17 filings..

18
19 The following Company witnesses discuss various IS capital investments:

- 20 • Electric Customer Panel (Residential Solar Marketplace, E-Commerce
21 Marketplace, and Demand Response Management System);

Testimony of the Information Services Panel

- 1 • Electric Infrastructure and Operations Panel (supervisory control and
2 data acquisition system (“SCADA”) system and a Demand
3 Management System for Control Center operators and Distributed
4 Generation Interconnection Online Application Portal);
- 5 • Gas Infrastructure and Operations Panel (Gas Business Enablement);
- 6 • Shared Services Panel (Call Center Customer Contact Center/SDC
7 Technology Upgrade Implement Solution and proposed system
8 changes for recent orders in the Low Income proceeding, Case 14-M-
9 0565);
- 10 • Outdoor Lighting Panel (Outdoor Lighting Inventory Portal); and
- 11 • Advanced Metering Infrastructure Panel

12
13 This Panel discusses the need for and benefits of the following IS
14 investments:

- 15 • Technology Modernization
- 16 • Projects to Support System Modernization
- 17 • Cyber Security
- 18 • Physical Security
- 19 • HRIS

20

Testimony of the Information Services Panel

1 **Q. What are the projected total rent expenses for IS projects and**
2 **investments to Niagara Mohawk in the Rate Year and Data Years?**

3 A. In the Historic Test Year, Niagara Mohawk's existing IS service company
4 rent expense balance was \$26.283 million for electric and \$4.262 million
5 for gas. The rent expense to Niagara Mohawk's electric and gas business
6 in the Rate Year and Data Years is shown in the Revenue Requirement
7 Panel's Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3),
8 Schedule 9, Workpapers 3, 6 and 9. As shown in Exhibit RRP-3,
9 Schedule 9, Page 6, the Company is forecasting IS rent expense of
10 \$39.530 million and \$8.788 million in the Rate Year for the electric and
11 gas business, respectively, of which \$24.051 million and \$4.255 million,
12 respectively, represents the portion of Historic Test Year rent expense
13 continued into the Rate Year. The level of Rate Year IS investment is
14 projected to continue into the Data Years.

15

16 **A. Technology Modernization**

17 **Q. Please describe the IS Technology Modernization Program.**

18 A. The IS Technology Modernization Program is a multi-year investment
19 program that will (i) upgrade aged IS infrastructure to address reliability
20 concerns, sustain high operational efficiency and ensure business
21 continuity; (ii) modernize critical applications to improve health and

Testimony of the Information Services Panel

1 availability, deliver new capabilities, and simplify application landscape;
2 and (iii) update operational technology networks to enable distribution
3 automation, monitoring, and metering. Specifically, the IS Technology
4 Modernization Program will deliver the following benefits:.

- 5 • With respect to applications, the program will:
 - 6 ○ upgrade applications at end of life to current and
 - 7 supported versions;
 - 8 ○ retire at risk applications;
 - 9 ○ consolidate core systems to simplify application
 - 10 landscape;
 - 11 ○ develop architecture that allows reuse and easy
 - 12 application “plug-in”;
 - 13 ○ develop new tools to manage applications and automate
 - 14 business process monitoring;
 - 15 ○ roll out agile development practices at scale for
 - 16 effective and timely delivery; and
 - 17 ○ and reduce cyber risk through upgrades to operating
 - 18 systems and/or applications
 - 19
- 20 • With respect to infrastructure, the program will:
 - 21 ○ remediate high risk, failure-prone assets to ensure
 - 22 business continuity;
 - 23 ○ improve network capabilities to enable cloud and
 - 24 mobile adoption, improve cyber-security, and ease
 - 25 maintainability;
 - 26 ○ modernize the end user environment to provide new
 - 27 and flexible collaboration capabilities (internally and
 - 28 externally); and
 - 29 ○ adopt strategic data centers to mitigate risk and enable
 - 30 robust, scalable infrastructure solutions.
 - 31
- 32 • With respect to operational technology networks, the program
- 33 will:
 - 34 ○ improve asset management and operation; and
 - 35 ○ enable operational effectiveness through retirement of
 - 36 dated assets as well as enhanced connectivity,

Testimony of the Information Services Panel

1 monitoring, automation, and improved procurement
2 processes.
3

4 Initiatives proposed as part of the IS Technology Modernization Program
5 are also necessary to enable and support the capabilities for the Gas
6 Business Enablement Program, system modernization, and the upgrade
7 work required for customer experience solutions, including Outage
8 Management System (“OMS”) server upgrades, Customer Service System
9 billing upgrades, and online self-service portals and updates to National
10 Grid’s work management systems, Storms and Maximo, for customers to
11 request Distributed Generation (“DG”) interconnections and new electric
12 and gas connections.
13

14 **Q. What projects are included in the IS Technology Modernization**
15 **Program?**

16 A. The capital projects included in the IS Technology Modernization
17 Program for the Rate Year and Data Years, and their benefits, are
18 described in Exhibit __ (ISP-4).
19

Testimony of the Information Services Panel

1 **Q. What costs are associated with the IS Technology Modernization**
2 **Program?**

3 A. The costs of IS Technology Modernization include a \$125.935 million
4 capital investment. As shown in Exhibit __ (RRP-11), the Workpapers to
5 Exhibit __ (RRP-3), Schedule 9, Workpaper 3, Niagara Mohawk's rent
6 expense forecast for these investments is \$1.548 million for its electric
7 business and \$0.297 million for its gas business in the Rate Year. Exhibit
8 __ (RRP-11), the Workpapers to Exhibit __ (RRP-3), Schedule 9,
9 Workpapers 6 and 9 also show the forecast rent expense for the projects to
10 Niagara Mohawk in the Data Years.

11

12 **B. System Modernization**

13 **Q. Please describe the System Modernization projects.**

14 A. The Company proposes to implement five additional, interconnected IS
15 projects needed to support evolving business and customer needs, and
16 system modernization. The five projects are (1) Cloud Computing and
17 Data Lake; (2) Information Management and Advanced Analytics; (3)
18 Enterprise Service Bus ("ESB") Architecture and Application
19 Programming Interface (API) Integration Services; (4) Plant Information
20 ("PI") Historian; and (5) Load and DER Forecasting (also referred to as
21 Acquisition of Remote Sensing – New York).

Testimony of the Information Services Panel

1 **Q. Please describe the Cloud Computing and Data Lake project.**

2 A. To support grid modernization, the Company needs to enhance its data
3 management capabilities and make data more accessible to both customers
4 and employees. To that end, the Cloud Computing and Data Lake project
5 will establish a scalable, cloud-based repository for National Grid's data.
6 The repository will not only include internal data, such as asset and meter
7 information, but also external data, such as weather and real estate
8 information. The repository will provide employees with greater
9 capability to analyze data, create a holistic customer view, and provide
10 data accessibility to customers and third parties. Once implemented, the
11 cloud based repository will reduce computing time, allow for scalability,
12 enable the Company to respond to various business and customer
13 demands, and allow for the timely delivery of software applications and
14 other business capabilities. Because the Cloud Computing and Data Lake
15 is required to host the Information Management and Advanced Analytics
16 platform (discussed below) in the cloud, the project will be placed in-
17 service by March 31, 2021.

18

Testimony of the Information Services Panel

1 **Q. What are the costs associated with the Cloud Computing and Data**
2 **Lake project?**

3 A. The costs of the Cloud Computing and Data Lake project include a \$2.54
4 million capital investment for the costs associated with hosting a
5 dashboard environment (production, development, quality assurance). As
6 shown in Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3),
7 Schedule 9, Workpaper 9, Niagara Mohawk's rent expense forecast for
8 these investments is \$0.327 million for its electric business and \$0.015
9 million for its gas business in Data Year 2.

10

11 **Q. Please describe the Information Management and Advanced**
12 **Analytics project.**

13 A. The Information Management and Advanced Analytics platform will
14 provide next level capability and algorithms for data processing and trend
15 analysis to identify potential opportunities to add value, ranging from
16 expense reduction to customer satisfaction, for both the Company and its
17 customers. Specifically, the platform will analyze data from internal
18 operating systems and third party data providers, and provide holistic
19 output that the Company can use for advanced data processing and
20 analytics to support integrated DER planning and load forecasting
21 hosting capacity analysis, and the integration of DER into real-time

Testimony of the Information Services Panel

1 operations. The program is projected to be in-service by March 31,
2 2021.

3
4 **Q. What are the costs of the Information Management and Advanced**
5 **Analytics platform?**

6 A. The costs of the Information Management and Advanced Analytics
7 project include a \$19.875 million capital investment for the purchase of
8 software licenses and costs associated with data import, data quality and
9 dashboard development. As shown in Exhibit __ (RRP-11), Workpapers
10 to Exhibit __ (RRP-3), Schedule 9, Workpaper 9, the rent expense for
11 this investment in Data Year 2 is \$0.939 million for the electric business
12 and \$0.045 million for the gas business.

13
14 **Q. Please describe the ESB Architecture and API Integration Services**
15 **project.**

16 A. A number of IS systems are being deployed or enhanced to support the
17 Company's portfolio of system modernization projects. Data will need
18 to be exchanged between these systems to optimize performance and
19 encourage synergies. The Company's current systems cannot support the
20 required data exchange, and thus the Company needs to implement two
21 main enabling components – (1) a new Distribution ESB and (2)

Testimony of the Information Services Panel

1 configuration of various integrations to connect programs and software –
2 to allow internal systems to communicate and transfer data, automate and
3 manage business processes, and enable real-time and batch integration.
4 This project is expected to be in-service by March 31, 2021.

5

6 **Q. What are the costs of the ESB Architecture and API Integration**
7 **Services project?**

8 A. The costs of the ESB Architecture and API Integration Services project
9 include a \$15.956 million capital investment for software costs and
10 installation of the software in the development, testing, production, and
11 disaster recovery environments. As shown in Exhibit __ (RRP-11),
12 Workpapers to Exhibit __ (RRP-3), Schedule 9, Workpaper 9 Niagara
13 Mohawk's rent expense forecast for this investments beginning in Data
14 Year 2 is \$0.723 million for the electric business and \$0.066 million for
15 the gas business.

16

17 **Q. What is the PI Historian project and when will it be implemented?**

18 A. The PI Historian project will implement a dedicated, real-time data
19 historian database that will retrieve and record data from process control
20 systems into a compressed time series database to enable efficient data
21 storage and fast retrieval. The PI Historian project will support grid

Testimony of the Information Services Panel

1 modernization, system modernization and the deployment of the new
2 Distribution Supervisory Control and Data Acquisition (“DSCADA”)
3 system, and is expected to be placed in service by September 30, 2018.
4

5 **Q. What are the costs of the PI Historian project?**

6 A. The costs of the PI Historian project will include \$11.43 million in capital
7 investment related to a one-time licensing fee for the PI software and
8 hardware and application installation costs. As shown in Exhibit __
9 (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule 9, Workpaper 3,
10 Niagara Mohawk’s rent expense forecast for these investments is \$0.474
11 million for its electric business in the Rate Year. Exhibit __ (RRP-11),
12 Workpapers to Exhibit __ (RRP-3), Schedule 9, Workpapers 6 and 9 also
13 shows the forecast rent expense for the capital expenditures needed to
14 support the project in the Data Years.
15

16 **Q. Please describe the Load and DER Forecasting project.**

17 A. This project will create an image data library of customer buildings and
18 Company assets in Niagara Mohawk’s service territory. Flyovers of the
19 Company’s service territory will be conducted to capture data that is more
20 current and detailed than what is publicly available and currently
21 accessible to National Grid. The flyovers will provide updated imagery on

Testimony of the Information Services Panel

1 asset condition and building characteristics such as square footage and
2 roof pitch. This imagery will provide the Company with a better
3 understanding of current DER penetration and how DER could be used by
4 customers in the future, improve the Company's existing customer and
5 asset data, and improve grid operation, planning and management. The
6 imagery will be acquired in FY18, and, once complete will be maintained
7 by the Company in the cloud environment for future analytics.

8

9 **Q. What are the costs associated with the Load and DER Forecasting**
10 **project?**

11 A. The costs of Load and DER Forecasting project include an \$8.632 million
12 capital investment for costs associated with the flyovers and creation of
13 the image inventory. As shown in Exhibit __ (RRP-11), Workpapers to
14 Exhibit __ (RRP-3), Schedule 9, Workpaper 3, Niagara Mohawk's rent
15 expense forecast for these investments is \$1.345 million for its electric
16 business and \$0.499 million for its gas business in the Rate Year. Exhibit
17 __ (RRP-11), Workpapers to Exhibit _ (RRP-3), Schedule 9, Workpapers
18 6 and 9 also shows the forecast rent expense for the capital expenditures
19 needed to support the project in the Data Years.

20

Testimony of the Information Services Panel

1 **C. Cyber Security**

2 **Q. How is Niagara Mohawk addressing cyber security threats?**

3 A. In 2010, National Grid established the Digital Risk and Security
4 organization within the IS organization to protect National Grid's energy
5 networks, IS systems, and confidential company and customer information
6 from cyber security threats. Digital Risk and Security addresses known
7 threats, evaluates emerging threats against National Grid's control
8 environment, and reviews and evolves its program of cyber security
9 initiatives to proactively identify and protect National Grid from emerging
10 threats.

11

12 The Cyber Security 1 Program (INVP 3614) has been developed to
13 enhance National Grid's cyber capabilities, outlining a multi-year
14 investment strategy targeted to better keep pace with the escalating threats.

15 The intention of the Cyber Security 1 Program is to deliver an additional
16 set of safeguards within the National Grid digital environment to address
17 key areas of threat identified as high risk including:

- 18 • **Unauthorized Access / Insider Attack:** This includes threats to
19 National Grid facilities, personnel, systems and data due to
20 unauthorized access or from a trusted source within the National
21 Grid security perimeter.
- 22 • **System Availability / Malfunction:** These are threats to National
23 Grid systems or data due to system malfunction.

Testimony of the Information Services Panel

- 1 • **Malware / Virus Attack:** These include threats to National Grid
2 systems or data from an indirect attack via malware or virus
3 infestation.
- 4 • **Advanced Persistent Threat / External Attack:** This includes
5 threats to National Grid facilities, personnel, systems or data via a
6 directed attack by an outside party from outside the security
7 perimeter with the intent of causing damage or destruction.
- 8 • **Data Leakage / Loss:** These include a threat to National Grid data
9 confidentiality and integrity when sensitive data is disclosed to
10 unauthorized personnel either by malicious intent or an inadvertent
11 mistake.
- 12 • **Regulatory Non-Compliance:** These are threats of fine or
13 sanction resulting in monetary loss or negative reputational impact.
14

15 **Q. What is National Grid's plan to address cyber security in the Rate**
16 **Year and Data Years?**

17 A. National Grid's approach to cyber security must evolve constantly to keep
18 pace with the changing threats. Digital Risk and Security's approach to
19 cyber security is a holistic one, intended to span from global enterprise IT
20 security down through the more challenging arena of Niagara Mohawk's
21 SCADA system. Digital Risk and Security's strategy is organized around
22 strategic goals of enabling and safeguarding the business, positioning
23 cyber measures as a true first, second, and third line of defense, and
24 establishing a risk management and governance framework to
25 communicate cyber risk and prioritize projects.

26

Testimony of the Information Services Panel

1 As shown in Exhibit __ (ISP-3) and Exhibit __ (ISP-5), National Grid will
2 deliver a number of projects after the Historic Test Year but prior to the
3 Rate Year from (1) the original scope of the Cyber Security 1 Program and
4 (2) an expanded and re-sanctioned November 2016 scope of the Cyber
5 Security 1 Program to include a single view of business and Critical
6 Network Infrastructure (“CNI”) network operations in a central location.
7 Specifically, in November 2016, National Grid IS re-sanctioned the Cyber
8 Security 1 Program after being advised by U.S. and U.K. governmental
9 agencies of a real threat of a malicious cyber attack against energy
10 networks and a further review of the overall design of National Grid’s
11 security solutions.

12
13 Beginning May 2017 and continuing into the Rate and Data Years,
14 National Grid’s cyber strategy will include initiatives and investments
15 needed to ensure the continued and evolving protection of the Company’s
16 cyber and information assets (“Cyber Security 2 Program,” INVP 3683).
17 The Cyber Security 2 Program will provide National Grid with the ability
18 to support new business capabilities as they are introduced, such as system
19 modernization, as well as provide the capability to perform fully
20 automated state security monitoring with real time remediation. A
21 definition phase of the Cyber Security 2 Program is currently in process

Testimony of the Information Services Panel

1 with an expected completion in Spring 2017. The program of work will
2 assess the level of capability needed, finalize costs, implement a
3 prioritized set of investments, set a delivery plan, and ensure the scope of
4 work aligns with the goals and objectives of Digital Risk and Security's
5 cyber strategy as discussed earlier.

6
7 **Q. Please explain how National Grid's planned cyber security**
8 **investments for the Rate Year and Data Years support the Company's**
9 **system modernization and distributed platform investments.**

10 A. The convergence of information and operational technology, and
11 evolution of the utility into an interconnected system of systems is
12 presenting unprecedented cyber security challenges. The Cyber Security 2
13 Program, as well as system modernization cyber security safeguards, were
14 developed to address those challenges, enabling the modernization of the
15 system while enhancing cyber security capabilities and protections to
16 address the threats that have been introduced from the new utility digital
17 landscape.

18
19 System modernization will advance the integration of DER both in front
20 of and behind the meter, the development of the Company's DSP, and a
21 myriad of customer energy products and services. These initiatives will

Testimony of the Information Services Panel

1 provide the Company a host of opportunities to improve the way it
2 operates, but consequently, introduce new channels through which
3 vulnerabilities can be exploited and potentially hinder safe, secure, and
4 reliable operation. As a result, the Company has developed a framework,
5 including a range of cyber security capability investments, to address the
6 new challenges introduced by system modernization. A risk-based, end-to-
7 end, “defense-in-depth” approach utilizing repeatable security processes
8 with a series of defense capabilities has been developed to proactively
9 identify and mitigate cyber security risks and strengthen the
10 confidentiality, integrity, and availability of smart grid infrastructure, data,
11 and processes.

12
13 The system modernization capabilities have minimal overlap with
14 capabilities set forth by the Cyber Security 1 and Cyber Security 2
15 Programs as modernization introduces new objectives and complexities,
16 such as increased third party and customer interactions, that were not
17 previously taken into account during definition of the Cyber Security 1
18 and Cyber Security 2 Programs. Where overlap may occur, investments
19 will be reassessed to leverage potential synergies in capability, cost, and
20 delivery. Timing of modernization investments will also play a role, as

Testimony of the Information Services Panel

1 delivery of capability in the Cyber Security 2 Program cannot be further
2 deferred without introducing additional security risk.

3

4 **Q. What cyber security projects is National Grid planning for the Rate**
5 **Year and Data Years?**

6 A. A description of each of National Grid's forecast cyber security projects
7 for (i) the period between the Historic Test Year and the Rate Year, (ii) the
8 Rate Year and (iii) the Data Years, is contained in Exhibit __ (ISP-5). The
9 cyber security investments for system modernization capabilities are
10 detailed in Exhibit __ (ISP-6).

11

12 **Q. What are the projected costs of the cyber security projects National**
13 **Grid has planned for the Rate Year and Data Years?**

14 A. The cyber security projects, including those supporting system
15 modernization, are forecast to require \$97.597 million in capital
16 investment, as shown in Exhibit __ (ISP-3). As shown in Exhibit __
17 (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule 9, Workpaper 3,
18 Niagara Mohawk's rent expense forecast for the projects is \$1.391 million
19 for its electric business and \$0.267 million for its gas business in the Rate
20 Year. Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule

Testimony of the Information Services Panel

1 9, Workpapers 6 and 9 also show the forecast rent expense for the projects
2 to Niagara Mohawk for the Data Years.

3

4 **D. Physical Security**

5 **Q. What is the purpose of National Grid's physical security investments?**

6 A. National Grid operates electric and gas energy infrastructure that could be
7 subject to physical attack. Physical security threats include the risk that
8 unauthorized individuals will attempt to enter the Company's facilities
9 with the intent of vandalizing property, equipment or facilities, theft of
10 tangible or intellectual property, or damage of critical equipment.
11 National Grid's physical security measures are intended to mitigate the
12 risk of such threats by deploying enhanced security systems across
13 company networks and facilities to detect and deter physical attacks.

14

15 **Q. Please describe the physical security counter measures in place for**
16 **Niagara Mohawk.**

17 A. Over the past several years, as a result of heightened understanding of
18 evolving physical security risks, National Grid has significantly increased
19 its deployment of physical security assets, such as facility access card
20 readers, security cameras, and alarm systems, to meet regulatory
21 requirements, enhance customer and employee safety, and safeguard

Testimony of the Information Services Panel

1 assets. In 2013, National Grid created a centralized organization to
2 address physical security issues, the Physical Security Control Center
3 (“Security Control Center”). The Security Control Center operates around
4 the clock to monitor physical security incidents and provide immediate
5 operations and emergency response for all National Grid facilities,
6 including those of Niagara Mohawk. National Grid monitors 241 sites in
7 total, of which 84 are Niagara Mohawk sites. The staff of the Security
8 Control Center disseminates security information and notifications,
9 monitor cameras and receives and responds to alarms. National Grid has,
10 and is continuing to increase, the number of sites monitored by the
11 Security Control Center.

12
13 **Q. What incremental physical security projects and expenses is the**
14 **Company planning for the Rate Year and Data Years?**

15 A. As shown in Exhibit __ (ISP-3), the Physical Security Control Center is
16 planning incremental projects, commencing after the Historic Test Year
17 and continuing into the Rate Year and Data Years, to implement:

- 18 • scheduled replacement of end of life security equipment at several
19 Niagara Mohawk facilities;
- 20 • improvements to the access management system at the Kensington
21 and Albany facilities and other facilities;

Testimony of the Information Services Panel

- a build out of an alternate Security Control Center; and
- an upgrade of National Grid's video management system used for recording, viewing and video analytics for intrusion detection at critical and non-critical facilities.

These projects are forecast to cost \$5.713 million in capital expense, as shown in Exhibit __ (ISP-3). As shown in Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule 9, Workpaper 3, Niagara Mohawk's rent expense forecast for these investments is \$0.194 million for its electric business and \$0.037 million for its gas business in the Rate Year. Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule 9, Workpapers 6 and 9 also show the forecast rent expense for the projects to Niagara Mohawk for the Data Years.

In addition, the Physical Security Control Center is planning a project for break/fix and scheduled replacement of end of life security systems at Niagara Mohawk bulk power stations and transmission control centers. Exhibit__(RRP-11), Workpapers to Exhibit (RRP-7) Schedule 1, Workpaper 9 (work order 90000180238) includes the costs of the improvements to Niagara Mohawk of \$0.200 million in the Rate Year, \$0.200 million in Data Year 1 and \$0.228 million in Data Year 2.

Testimony of the Information Services Panel

1 **E. Human Resources (“HR”) Simplification Program**

2 **Q. Please describe the HRIS Simplification Program.**

3 A. The HRIS Simplification Program (“HRIS Program”) is a global program
4 that will leverage new, cloud-based technologies to significantly improve
5 HR systems, processes, and data. The program is intended to provide
6 simple, intuitive, and user friendly human resources tools and processes.
7 Specifically, the program will implement SAP SuccessFactors, a cloud-
8 based human resources platform, and reconfigure core HR processes to
9 align with industry best practices.

10

11 **Q. Why is National Grid implementing the HRIS Program?**

12 A. HRIS Program implementation will (i) eliminate present and potential
13 future issues with the existing HR systems; (ii) serve as the foundation for
14 future system upgrades; and (iii) provide numerous benefits and
15 capabilities unavailable in existing systems.

16

17 The Company currently utilizes the SAP Human Capital Management
18 (“HCM”) framework to provide HR services. The HCM framework does
19 not support an integrated HR framework, results in data duplication and
20 process inefficiencies, and requires intensive resources for maintenance.
21 Transitioning away from the HCM framework will modernize the

Testimony of the Information Services Panel

1 technology, allow for integration across multiple platforms, and resolve
2 data integrity issues. Additionally, SAP is no longer developing software
3 for the HCM framework, and plans to end its support in 2025, encouraging
4 migration to the SuccessFactors. The migration to SuccessFactors under
5 the HRIS Program allows National Grid to proactively replace the HCM
6 framework before it becomes obsolete and more expensive to maintain.
7 Finally, implementation of SuccessFactors will replace several systems
8 currently used by HR, and thus reduces the number of software upgrades
9 that would have been required for those systems.

10
11 The timing of HRIS Program implementation, more specifically SAP
12 SuccessFactors, is critical as it will serve as the foundation for the
13 transition of other back office systems, for example finance and payroll, to
14 a cloud-based environment. Further, implementing SAP SuccessFactors
15 now reduces the risk associated with transitioning multiple back office
16 systems (HR and Payroll) at the same time.

17
18 **Q. What are the benefits of the HRIS Program?**

19 **A.** The HRIS Program will result in certain benefits and efficiencies that will
20 help HR and the business operate more efficiently. These benefits and
21 efficiencies can be grouped into four general categories:

Testimony of the Information Services Panel

- 1 • **Data Integrity** – The program will provide a single, reliable
2 source of data for incorporation into business processes.
- 3 • **Simplification** – The program will automate and simplify HR
4 processes, thereby reducing the amount of time and resources
5 spent on those processes.
- 6 • **Workforce Planning** – The program will allow the Company
7 to respond to and anticipate changing workforce trends and
8 engage new candidates in a timely fashion.
- 9 • **Accessibility** – The program will provide real-time access to
10 information from any location, including mobile devices.

11

12 The HRIS Program will also deliver tangible benefits to the business
13 resulting from the reduction of manual employee inputs, administrative
14 tasks, HR interfaces, and software costs associated with the existing HR
15 systems. The total annual savings for the program are estimated at \$1.164
16 million. These total savings have been applied against the total
17 incremental run the business costs as shown in Exhibit __ (ISP-7) and
18 discussed below.

19

Testimony of the Information Services Panel

1 **Q. What is the implementation date of the HRIS Program?**

2 A. The HRIS Program is scheduled in service by May 2018.

3

4 **Q. What are the costs to Niagara Mohawk associated with the HRIS**
5 **Program?**

6 A. The HRIS Program will be owned by National Grid plc, and thus Niagara
7 Mohawk will not see an increase in its rent expense associated with the
8 asset. However, once the HRIS Program is in service, there will be annual
9 costs to run the program and support the business, including license and
10 maintenance fees as well as vendor payments for the cloud operating
11 infrastructure. Niagara Mohawk's allocated share of these costs have been
12 included in the incremental project operating expenses discussed below as
13 shown in Exhibit __ (ISP-8).

14

15 **F. DG Customer Information System ("CIS") Solution**

16 **Q. Please describe the DG CIS project.**

17 A. The DG CIS project involves the re-design of the Company's customer
18 system platform, CSS, to an adaptable model supported by more current
19 technologies and skillsets. The Company's customer systems are
20 increasingly difficult to support, lack flexibility in new businesses, and
21 require far too long to adapt to new business processes. The evolution of

Testimony of the Information Services Panel

1 DG will lead to new forms of energy trading, commerce, and information
2 exchange across smart meters, appliances, and network devices. The
3 Company must implement a new customer system solution that will
4 handle new DG customer processes from enrollment through the meter to
5 cash process cycle and will enable the future energy marketplace. The DG
6 CIS project will also facilitate complete or targeted movement of customer
7 businesses to the new platform allowing planned retirements. The
8 Company expects the DG CIS project to be in-service in March 2020.

9
10 **Q. What costs are associated with the DG CIS project?**

11 A. National Grid is in the early planning stages of this project. The Company
12 plans on utilizing the capital forecast for Regulatory Mandates as shown in
13 Exhibit __ (ISP-3) for the planning work on the DG CIS project.

14
15 **VI. Rate Year IS Operating Costs**

16 **Q. What is the forecast of Niagara Mohawk's total IS operating costs for**
17 **the Rate Year and Data Years as compared to the Historic Test Year?**

18 A. As set forth on Exhibit __ (ISP-8), National Grid's IS operating costs,
19 excluding the operating costs associated with the Gas Business
20 Enablement Program and the system modernization investments, are
21 projected to increase from \$233.4 million in the Historic Test Year to

Testimony of the Information Services Panel

1 \$273.3 million in the Rate Year, \$283.2 million in Data Year 1, and
2 \$272.3 in Data Year 2. Adjusting for inflation, total IS operating costs
3 increase by \$28.3 million in the Rate Year and \$3.2 million in Data Year
4 1, decreasing by \$16.9 million in Data Year 2. As shown in Exhibit __
5 (ISP-8), Niagara Mohawk's allocated share of these incremental operating
6 expenses for its electric business, including the impact of inflation, is
7 \$6.76 million in the Rate Year and \$0.77 million in Data Year 1 with a
8 decrease of \$4.04 million in Data Year 2. Niagara Mohawk's allocated
9 share of these incremental operating expenses for its gas business,
10 including the impact of inflation, is \$1.30 million in the Rate Year and
11 \$0.15 million in Data Year 1 with a decrease of \$0.78 million in Data Year
12 2. Increases in operational costs and investment plan costs are driving the
13 increase in forecasted IS operating costs for the Rate and Data Years as
14 shown in Exhibit __ (ISP-8) and discussed more fully below.

15
16 **Q. What are the significant elements of the increases in National Grid's**
17 **IS operational costs between the Historic Test Year and the Rate Year**
18 **and Data Years?**

19 **A.** As set forth on Exhibit __ (ISP-8), the primary areas where National Grid
20 projects an increase in IS operational costs are as follows:

Testimony of the Information Services Panel

1 Commercial Management – The Commercial Management area is
2 responsible for the negotiation of Master Service Agreements and the
3 management of enterprise software purchasing and licensing agreements
4 with significant IS vendors such as SAP, Microsoft and Oracle.
5 Additional operating costs will be incurred in this area to strengthen the
6 oversight of third party agreements, to assess and manage existing external
7 providers and to manage the renegotiation of IS contracts that are expiring
8 over the next few years.

9
10 Application maintenance costs – These are the costs of support from IBM
11 and Wipro for all the applications National Grid has developed for internal
12 use. Newly released applications are added to the inventory of supported
13 applications as they are placed in service under fixed priced contracts with
14 annual price reviews. These costs are increasing because of the continued
15 need to operate and maintain multiple complex systems such as SAP; the
16 need to support new capabilities in FY17 and FY18 (*e.g.*, Energy
17 Management System (“EMS”), OMS and system modernization); and the
18 evolving need to match technical capabilities of solutions with ever-
19 changing technology options (*e.g.*, technology modernization).

20

Testimony of the Information Services Panel

1 Critical Network Infrastructure (“CNI”) operations – CNI operations
2 involve the administration of systems that permit Niagara Mohawk to
3 operate its energy grids, including the Company’s critical electric and gas
4 management systems, its OMS, EMS and its distribution management
5 system. The Company’s recent re-investments in the EMS and OMS in
6 February 2015 and November 2015, respectively, are enabling increased
7 capabilities and monitoring that require incremental support from the CNI
8 area.

9
10 Enterprise Service Delivery – This includes the management and oversight
11 of internal operations of IS infrastructure, including user service and
12 support, vendor management for application maintenance,
13 Email/SharePoint services, Data Centers and user desktops and laptops.
14 Costs are increasing in this area due to the need to manage increased
15 application maintenance (described above), and to ensure new applications
16 operate properly in the increasingly complex technology environment –
17 cyber security, cloud capability, integration with new application
18 investments.

19
20 Cyber security – As discussed earlier, cyber security is a constantly
21 evolving area that requires increased vigilance and support for changing

Testimony of the Information Services Panel

1 threats. Additional operational support costs will be required to manage
2 the security toolsets in place to monitor, detect, and mitigate cyber
3 security threats; and for governance, risk and compliance and program
4 administration activities to work closely with the business to identify and
5 address emerging cyber risks to systems supporting the electric and gas
6 networks.

7
8 Physical security – As also discussed earlier, physical security manages
9 and implements physical measures at the Company’s business sites, office
10 buildings and operational facilities. Incremental costs are required for
11 monitoring and controlling access. In addition, increased operational costs
12 for physical security break/fixes are expected in the Rate Year compared
13 to the Historic Test Year, which experienced a milder than usual winter.

14
15 Administrative – Additional incremental costs are required to manage the
16 sanctioning process resulting from increased demand for IS services;
17 conduct program assurance activities to implement common and best
18 practices; manage projects and oversee development of applications; and
19 manage and develop the overall cyber security strategy. Many of the
20 existing vendor contracts that support the current IS delivery model are up
21 for renewal over the next few years and National Grid has determined that

Testimony of the Information Services Panel

1 greater internal attention is also needed to assist with the negotiation and
2 administration of new vendor agreements in an increasingly complex
3 technological environment.

4
5 In addition, National Grid will make some refinements to its service
6 delivery model to build and partner internal skills and expertise with
7 business areas in the prioritization and delivery of strategic investments.
8 This will result in greater internal technical expertise and control over
9 vendors, accelerate IS project delivery due to improved coordination
10 between IS and the business functions, and enable the needed IS support
11 of system modernization.

12
13 The remaining IS operational costs are projected to either grow at rates
14 less than or equal to inflation or to decline slightly.

15
16 **Q. What is the projected increase in IS operating expenses associated**
17 **with investment plan costs?**

18 A. Investment plan costs are costs associated with particular projects that
19 have not yet been placed in service and include (i) project operating
20 expenses (“Project OpEx”) that may not be capitalized under applicable
21 accounting rules (*i.e.*, O&M incurred to support investment planning

Testimony of the Information Services Panel

1 during the startup stage and post application development); and (ii) costs
2 incurred to operate and maintain projects after they are placed in service
3 such as license fees, maintenance costs and other operating costs (“run the
4 business costs”).

5
6 Excluding the impact of the incremental project operating expenses of Gas
7 Business Enablement and system modernization projects, the investment
8 plan costs are expected to increase from \$11.8 million in the Historic Test
9 Year to \$42.7 million and \$46.0 million in the Rate and Data Year 1,
10 respectively. As shown in Exhibit __ (ISP-7), these increases are
11 primarily related to the capital investments for Technology Modernization
12 and the cyber security investments discussed above. Project operating
13 costs are expected to decrease to \$27.7 million in Data Year 2 as a result
14 of the conclusion of the three year implementation of Technology
15 Modernization commencing in FY18. In addition, the reduced Data Year
16 2 costs reflect the return to more typical levels of investment after a period
17 of significant investment and a tailing off of the initial project operating
18 costs (*i.e.*, startup, requirements) near the end of the typical three year
19 planning horizon for the IS investment plan.

20

Testimony of the Information Services Panel

1 **Q.** **Does this conclude your testimony?**

2 **A.** **Yes.**

Testimony of the Information Services Panel

Index of Exhibits

Exhibit__ (ISP-1)	Allocations codes used to determine the forecast annual rent expense to Niagara Mohawk for IS projects
Exhibit__ (ISP-2)	Operating Expenses
Exhibit__ (ISP-3)	IS capital projects and investments
Exhibit__ (ISP-4)	IS Technology Modernization projects and customer benefits
Exhibit__ (ISP-5)	National Grid's cyber security IS projects
Exhibit__ (ISP-6)	National Grid's cyber security projections for system modernization
Exhibit__ (ISP-7)	Forecast of Purchased Gas Expense Rate Year and Data Years
Exhibit__ (ISP-8)	IS operating expenses for the Historic Test Year, Rate Year and Data Years

Testimony of the Information Services Panel

Exhibit __ (ISP-1)

Allocations codes used to determine the forecast annual rent expense
to Niagara Mohawk for IS projects

Niagara Mohawk Power Corporation d/b/a National Grid
ISP-1 Allocations used for IS Project:

SAP Alloc. Code	Description	Allocation Basis	NMPC - ELEC/NMPC - GAS/NMPC - TRANS/NMPC Total	ALL OTHER CO TOTAL
C-113	NMPC Electric and NMPC Gas	C - Number of Customers via Count of Meters Installed	72.91%	0.00%
C-170	NMPC-E&G, KEDNY, KEDLI	C - Number of Customers via Count of Meters Installed	40.06%	100.00%
C-175	All Retail Companies:	C - Number of Customers via Count of Meters Installed	14.88%	45.06%
C-195	NIMO & KEDLI	C - Number of Customers via Count of Meters Installed	8.65%	68.07%
C-198	All Electric Distributor	C - Number of Customers via Count of Meters Installed	21.56%	20.53%
C-210	All Gas Retails	C - Number of Customers via Count of Meters Installed	0.00%	52.29%
G-012	All Companies (largest set)	G - General Allocator, 3-Point Formula	16.89%	83.11%
G-020	Parents: Retail, TRAN, Hydros, NG LNG Reg, KS GEN, GW, PJ, Metrowest, Wayfinder, Transgas, KEDC, KS	G - General Allocator, 3-Point Formula	6.11%	100.00%
G-077	Legacy NG Retails, NMPC-T, NEP-T, Hydros	G - General Allocator, 3-Point Formula	4.58%	71.55%
G-113	NMPC Electric and NMPC Gas	G - General Allocator, 3-Point Formula	7.38%	54.66%
G-114	Niagara Mohawk (Else, Gas and Trans)	G - General Allocator, 3-Point Formula	9.98%	100.00%
G-138	All Retail, NMPC-T, NEP-T, KS Generation, GW and Port Jefferson	G - General Allocator, 3-Point Formula	20.54%	0.00%
G-148	Retails, Transmission	G - General Allocator, 3-Point Formula	15.97%	100.00%
G-149	All Retails, TRAN, Hydros, NG LNG Reg, KS Generation, GW and Port Jefferson	G - General Allocator, 3-Point Formula	4.73%	70.66%
G-160	Legacy NG Retail, TRAN, Hydros, NG LNG Reg, KS Generation, GW and Port Jefferson	G - General Allocator, 3-Point Formula	4.83%	69.97%
G-170	NMPC-E&G, KEDNY, KEDLI	G - General Allocator, 3-Point Formula	4.61%	71.36%
G-175	All Retail Companies:	G - General Allocator, 3-Point Formula	7.15%	55.98%
G-179	Legacy NG Retail Companies:	G - General Allocator, 3-Point Formula	10.92%	45.59%
G-181	Niagara Mohawk Electric and Transmission	G - General Allocator, 3-Point Formula	5.73%	72.44%
G-186	NMPC-E&T, MECO-E&T, Nantucket, NECO-E&T, and NEP-T	G - General Allocator, 3-Point Formula	9.55%	55.27%
G-198	All Electric Distributor	G - General Allocator, 3-Point Formula	30.74%	100.00%
G-207	Niagara Mohawk Gas, KEDNY and KEDLI	G - General Allocator, 3-Point Formula	41.93%	58.27%
G-210	All Gas Retails	G - General Allocator, 3-Point Formula	0.00%	100.00%
G-220	Transmission, excl Hydr	G - General Allocator, 3-Point Formula	19.47%	80.53%
G-327	All Retail and Trans segments, NEP-T, Hydro:	G - General Allocator, 3-Point Formula	12.44%	87.56%
G-352	All Retail, All TRAN, KS Generation, GW and Port Jefferson	G - General Allocator, 3-Point Formula	0.00%	51.88%
G-376	All Retail excl NMPC-E, plus NMPC-T, NECO-T and KS Generation	G - General Allocator, 3-Point Formula	4.82%	70.07%
G-432	NMPC-T, NECO-T, NEP-T, KS Generation	G - General Allocator, 3-Point Formula	6.41%	71.26%
G-750	NMPC - Internal allocation negotiated with NYPS	G - General Allocator, 3-Point Formula	6.09%	85.76%
H-173	All Retail Companies:	G - General Allocator, 3-Point Formula	35.13%	64.87%
H-171	Reservoir Woods	H - Number of Bills Rendered	83.00%	100.00%
J-063	NMPC-E&T, MECO-E&T, Nantucket, NECO-E&T, and NEP-T	J - Number of Bills Rendered	19.12%	73.81%
U-186		U - RTU's	16.66%	77.18%
			9.74%	83.83%
			2.55%	100.00%
			0.00%	38.38%

Testimony of the Information Services Panel

Exhibit __ (ISP-2)

Operating Expenses

Niagara Mohawk Power Corporation d/b/a National Grid
CY16 IS Operating Expenses (\$Millions) for NMPC

<u>Operational Cost</u>	<u>CY16 (HTY)</u>
Commercial Management	6.3
Cyber Security	2.3
Physical Security	3.1
Apps Maintenance	4.5
CNI Ops	15.4
Data Centers	8.0
Verizon	10.3
Email & Xerox	2.2
Enterprise Service Delivery	4.8
Admin	6.4
Subtotal Operational Cost	63.3
<u>Investment Plan</u>	
IS Base	5.4
Investment Plan	5.4
CTA (IS Transformation)	4.4
Total IS Opex to NMPC	73.1

Testimony of the Information Services Panel

Exhibit __ (ISP-3)

IS capital projects and investments

Niagara Mohawk Power Corporation d/b/a National Grid
ISP-3 Information Services (IS) Capital Projects

In-flight projects										Inception To Date +				FY20		FY21		Total US CapEx	
Investment Name										FY18				CAPEX		CAPEX		Spend	
Programs										Amortization				Period		Period		Period	
Bill Pool										In Service Date				Period		Period		Period	
INVP #										Period				Period		Period		Period	
G020										G020				G020		G020		G020	
INVP 3614D1	Eni Network Security	Cyber Security	3614D1	G020	6/30/17	84	-	-	-	9,478,590	-	-	-	-	-	-	-	9,478,590	-
INVP 3614B7	CNI Network Security	Cyber Security	3614B7	G020	12/31/17	84	-	-	-	4,829,586	-	-	-	-	-	-	-	4,829,586	-
INVP 3614E4	US CNI Security I&E	Cyber Security	3614E4	G020	12/31/17	84	-	-	-	1,207,045	-	-	-	-	-	-	-	1,207,045	-
INVP 4144	Double File Mgmt DB	IT	4144	G020	3/31/17	84	-	-	-	421,173	-	-	-	-	-	-	-	421,173	-
INVP 4373	US CNI Security Upgrade	Cyber Security	4373	G020	2/28/17	84	-	-	-	254,000	-	-	-	-	-	-	-	254,000	-
INVP 3955	EJ Ward Upgrade	Admin Replacement	3955	G235	2/28/17	84	-	-	-	646,004	-	-	-	-	-	-	-	646,004	-
INVP 4188	Active Systems Sanitize	IT	4188	G148	3/31/17	84	-	-	-	782,710	-	-	-	-	-	-	-	782,710	-
INVP 4280	US VSTIG Bandwidth Ph.2	FY18 Plan	4280	G020	3/31/17	84	-	-	-	1,998,645	-	-	-	-	-	-	-	1,998,645	-
INVP 4307	US Win 7 Refresh Ph.3	FY18 Plan	4307	G020	3/31/17	84	-	-	-	11,562,999	-	-	-	-	-	-	-	11,562,999	-
INVP 4364	Wireless Network	FY18 Plan	4364	G020	3/31/17	84	-	-	-	2,303,959	-	-	-	-	-	-	-	2,303,959	-
S005242	M112 Systemic Improvement	FY18 Plan	N/A	G020	3/31/17	120	-	-	-	8,000,000	-	-	-	-	-	-	-	8,000,000	-
INVP 4289	US Network Improvement	FY18 Plan	4289	G020	3/31/17	84	-	-	-	978,717	-	-	-	-	-	-	-	978,717	-
INVP 2577C	AccPM Software Upgrade	FY18 Plan	2577C	G112	4/7/17	84	-	-	-	2,087,188	-	-	-	-	-	-	-	2,087,188	-
INVP 4631	Box Enablement	FY18 Plan	4631	G020	4/30/17	84	-	-	-	254,000	-	-	-	-	-	-	-	254,000	-
INVP 4170	Time Transformation	FY18 Plan	4170	G020	5/1/17	84	-	-	-	3,917,000	-	-	-	-	-	-	-	3,917,000	-
INVP 4420	US CNI OMS/Facility Infrastructure Upgrade	FY18 Plan	4420	G198	5/1/17	84	-	-	-	1,366,563	-	-	-	-	-	-	-	1,366,563	-
INVP 4274	VSTIG Hardware Refresh	FY18 Plan	4274	G020	5/31/17	84	-	-	-	608,000	-	-	-	-	-	-	-	608,000	-
INVP 4464	Data Visualization	FY18 Plan	4464	G020	7/31/17	84	-	-	-	4,440,000	-	-	-	-	-	-	-	4,440,000	-
INVP 4461	Unit51 Interface Migration	FY18 Plan	4461	G020	9/1/17	84	-	-	-	1,386,701	-	-	-	-	-	-	-	1,386,701	-
INVP 4287	Active Directory Upgrade	FY18 Plan	4287	G020	9/30/17	84	-	-	-	804,825	-	-	-	-	-	-	-	804,825	-
INVP 4386	US CNI Systems Replacement Delivery	FY18 Plan	4386	G148	9/30/17	84	-	-	-	3,070,943	-	-	-	-	-	-	-	3,070,943	-
INVP 4386	US MDS - Enterprise Edition (EE)	FY18 Plan	4386	G148	3/31/18	84	-	-	-	506,000	-	-	-	-	-	-	-	506,000	-
INVP 4390	Plastic Fusion II	FY18 Plan	4390	G207	3/31/18	84	-	-	-	1,462,000	-	-	-	-	-	-	-	1,462,000	-
INVP 4397	Arriba TLS and CI Update	FY18 Plan	4397	G020	3/31/18	120	-	-	-	24,205,719	-	-	-	-	-	-	-	24,205,719	-
INVP 4398	Storm/School Upgrade	FY18 Plan	4398	G160	12/15/18	84	-	-	-	9,523,867	-	-	-	-	-	-	-	9,523,867	-
INVP 3737	US CNI GMS SCADA Upgrade &	FY18 Plan	3737	G210	3/31/20	84	-	-	-	16,555,091	-	-	-	-	-	-	-	16,555,091	-
INVP 3882	NTS Pipeline Safety CMS	Other Mandates	3882	G207	3/17/17	84	-	-	-	1,308,000	-	-	-	-	-	-	-	1,308,000	-
INVP 3851	Consolidated Voice Recorder for US Electric Control Rooms.	Physical Security	3851	G181	3/31/17	84	-	-	-	1,234,000	-	-	-	-	-	-	-	1,234,000	-
Physical Security Replacements - FY17		Physical Security	N/A	G020	3/31/17	84	-	-	-	906,050	-	-	-	-	-	-	-	906,050	-
Physical Security Replacements - FY18		Physical Security	N/A	G020	3/31/18	84	-	-	-	950,000	-	-	-	-	-	-	-	950,000	-
Physical Security Replacements - FY19		Physical Security	N/A	G114	3/31/18	84	-	-	-	490,000	-	-	-	-	-	-	-	490,000	-
Physical Security Replacements - FY20		Physical Security	N/A	G020	3/31/19	84	-	-	-	825,000	-	-	-	-	-	-	-	825,000	-
Physical Security Replacements - FY21		Physical Security	N/A	G114	3/31/19	84	-	-	-	275,000	-	-	-	-	-	-	-	275,000	-
Physical Security Replacements - FY22		Physical Security	N/A	G020	3/31/20	84	-	-	-	835,000	-	-	-	-	-	-	-	835,000	-
Physical Security Replacements - FY23		Physical Security	N/A	G114	3/31/20	84	-	-	-	282,000	-	-	-	-	-	-	-	282,000	-
Physical Security Replacements - FY24		Physical Security	N/A	G020	3/31/21	84	-	-	-	860,000	-	-	-	-	-	-	-	860,000	-
Physical Security Replacements - FY25		Physical Security	N/A	G114	3/31/21	84	-	-	-	290,000	-	-	-	-	-	-	-	290,000	-
Physical Security Replacements - FY26		Physical Security	N/A	G225	3/31/21	84	-	-	-	1,629,117	-	-	-	-	-	-	-	1,629,117	-
Physical Security Replacements - FY27		Physical Security	4437	G020	7/31/17	84	-	-	-	92,005	-	-	-	-	-	-	-	92,005	-
Physical Security Replacements - FY28		Physical Security	4124	C198	8/31/17	84	-	-	-	3,594,165	-	-	-	-	-	-	-	3,594,165	-
Physical Security Replacements - FY29		Physical Security	3839A	C170	10/31/17	84	-	-	-	5,356,231	-	-	-	-	-	-	-	5,356,231	-
Physical Security Replacements - FY30		Physical Security	4411A+B	C198	11/30/17	84	-	-	-	3,347,611	-	-	-	-	-	-	-	3,347,611	-
Physical Security Replacements - FY31		Physical Security	4383	C170	12/31/17	84	-	-	-	551,447	-	-	-	-	-	-	-	551,447	-
Physical Security Replacements - FY32		Physical Security	4448	5220G	12/31/17	84	-	-	-	2,207,590	-	-	-	-	-	-	-	2,207,590	-
Physical Security Replacements - FY33		Physical Security	4448	C195	12/31/17	84	-	-	-	2,489,410	-	-	-	-	-	-	-	2,489,410	-
Physical Security Replacements - FY34		Physical Security	4411C	C198	4/30/18	84	-	-	-	698,000	-	-	-	-	-	-	-	698,000	-
Physical Security Replacements - FY35		Physical Security	4411D	C210	10/31/18	84	-	-	-	36,000	-	-	-	-	-	-	-	36,000	-

	Investment Name	Programs	INVP #	Bill Pool	In Service Date	Amortization Period	Inception To Date + FY18	FY19 CAPEX	FY20 CAPEX	FY21 CAPEX	Total US CapEx Spend
Planned Projects	Cloud Security	Cyber Security	3683	G020	5/1/17	84	1,460,000	-	-	-	\$1,460,000
	Risk Based Authentication - 2FA token alternative	Cyber Security	3683	G020	6/1/17	84	235,080	-	-	-	\$235,080
	Threat Behavior Modeling	Cyber Security	3683	G020	8/1/17	84	800,000	-	-	-	\$800,000
	Identity & Access Management Role Base Access Management (RBAC)	Cyber Security	3683	G020	10/1/17	84	1,650,000	-	-	-	\$1,650,000
	Enhanced DLP Gateway and Endpoint	Cyber Security	3683	G020	12/1/17	84	2,238,480	-	-	-	\$2,238,480
	US US CNI Intrusion Detection Prevention Phase 1	Cyber Security	3683	G020	3/3/18	84	550,000	-	-	-	\$550,000
	Identity & Access Management: Fine Grain Access Management	Cyber Security	3683	G020	3/3/18	84	1,650,000	-	-	-	\$1,650,000
	Stig. Scaling Upgrades	Cyber Security	3683	G020	8/1/18	84	1,000,000	-	-	-	\$1,000,000
	OT/TOT Discovery and Implementation Phase 1	Cyber Security	3683	G020	10/1/18	84	3,300,000	2,200,000	-	-	\$5,500,000
	Security Research Lab	Cyber Security	3683	G020	10/1/18	84	325,000	-	-	-	\$325,000
	US CNI Security Enhancements Phase 1	Cyber Security	3683	G020	11/1/18	84	-	1,650,000	-	-	\$1,650,000
	Identity & Access Management: Privileged Access Management	Cyber Security	3683	G020	3/3/19	84	-	-	1,740,000	-	\$1,740,000
	Domain Based Security Phase 1	Cyber Security	3683	G020	3/3/19	84	-	-	800,000	-	\$800,000
	Security Incident Event Management Phase 4	Cyber Security	3683	G020	5/1/19	84	633,150	-	-	-	\$1,266,300
	Big Data Security Analytics Phase 1	Cyber Security	3683	G020	5/1/19	84	2,310,776	-	-	-	\$4,621,552
	US CNI Intrusion Detection Prevention Phase 2	Cyber Security	3683	G020	3/1/20	84	800,000	-	-	-	\$800,000
	US CNI Intrusion Detection Prevention Phase 3	Cyber Security	3683	G020	3/1/20	84	-	-	300,000	-	\$300,000
	US CNI Intrusion Detection Prevention Phase 4	Cyber Security	3683	G020	5/1/20	84	-	-	-	500,000	\$500,000
	Security Incident Event Management Phase 5	Cyber Security	3683	G020	5/1/20	84	-	-	-	1,740,000	\$1,740,000
	Domain Based Security Phase 2	Cyber Security	3683	G020	5/1/20	84	-	-	-	733,150	\$733,150
Domain Based Security Phase 3	Cyber Security	3683	G020	3/31/21	84	-	-	-	3,000,000	3,000,000	
Security Incident Event Management (SIEM) 6	Cyber Security	3683	G020	5/1/21	84	-	-	-	-	733,150	\$733,150
Big Data Security Analytics - Phase 2	Cyber Security	3683	G020	5/1/21	84	-	-	-	3,466,164	\$5,776,940	
OT/TOT Discovery and Implementation: Phase 2	Cyber Security	3683	G020	10/1/21	84	-	-	-	3,769,230	\$7,000,000	
US CNI Security Enhancements - Phase 2	Cyber Security	3683	G020	11/1/21	84	-	-	-	2,640,000	\$3,960,000	
Data Visualization	Cyber Security	3683	G020	12/1/21	84	-	-	-	-	1,000,000	\$1,000,000
HANA License Costs	Cyber Security	3683	G020	12/1/21	84	-	-	-	-	-	\$1,000,000
Microsoft ELA Renewal	Cyber Security	3683	G020	3/31/17	84	-	-	-	-	-	\$3,500,000
Mobile Device Refresh - FY17	Cyber Security	3683	G020	3/31/17	84	-	-	-	-	-	\$1,900,000
Mobile Device Refresh - FY18 Plan	Cyber Security	3683	G020	3/31/17	84	-	-	-	-	-	\$4,546,000
US Video Conferencing upgrade for RW	Cyber Security	3683	G020	3/31/17	84	-	-	-	-	-	\$2,100,000
Hix DC Improvement Server Refresh	Cyber Security	3683	G020	3/31/17	84	-	-	-	-	-	\$1,330,000
Mobility - (MDM) Mobile Device	Cyber Security	3683	G020	6/1/17	84	-	-	-	-	-	\$1,000,000
Changes to ACIS for PMC C Civil Vendor Billing.	Cyber Security	3683	G020	7/1/17	84	-	-	-	-	-	\$1,000,000
US Control-Data System Operating Procedure (SOP) Upgrade	Cyber Security	3683	G020	7/31/17	84	-	-	-	-	-	\$1,162,000
Emergency Alerts - Application Upgrade Project	Cyber Security	3683	G020	8/2/17	84	-	-	-	-	-	\$82,000
WiFi for Fleet Services Diagnostic Laptops	Cyber Security	3683	G020	10/2/17	84	-	-	-	-	-	\$42,000
Gas Service Database - UNY	Cyber Security	3683	G020	10/2/17	84	-	-	-	-	-	\$42,000
Gas Service Database - DNY (LI and NYC)	Cyber Security	3683	G020	10/31/17	84	-	-	-	-	-	\$1,000,000
Substation Monitoring/Doble ARMS	Cyber Security	3683	G020	11/1/17	84	-	-	-	-	-	\$775,000
Gas Capital Investment Planning Tool	Cyber Security	3683	G020	11/1/17	84	-	-	-	-	-	\$838,000
Computable Enhancements to Support Inspection Types	Cyber Security	3683	G020	12/4/17	84	-	-	-	-	-	\$325,000
Travel & Expense Management (T&E) and Global Master Service Provider (MSP) Strategy	Cyber Security	3683	G020	1/1/18	84	-	-	-	-	-	\$300,000
Agentic System Substitution/Upgrades - FY18	Cyber Security	3683	G020	3/1/18	84	-	-	-	-	-	\$622,000
US Mobile Device Refresh	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$572,000
US SAP: Infrastructure Landscape	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 2	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 3	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 4	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 5	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 6	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 7	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 8	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 9	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 10	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 11	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 12	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 13	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 14	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 15	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 16	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 17	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 18	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 19	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 20	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 21	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 22	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 23	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 24	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 25	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 26	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 27	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 28	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 29	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 30	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 31	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 32	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 33	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 34	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 35	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 36	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 37	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 38	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 39	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 40	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 41	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 42	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 43	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 44	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 45	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 46	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 47	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 48	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 49	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 50	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 51	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 52	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 53	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 54	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 55	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 56	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 57	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 58	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 59	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 60	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 61	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 62	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 63	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 64	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 65	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 66	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 67	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 68	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 69	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 70	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 71	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 72	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 73	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 74	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 75	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 76	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 77	Cyber Security	3683	G020	3/31/18	84	-	-	-	-	-	\$450,000
US CNI Security Enhancements Phase 78	Cyber Security	3683	G020</								

199

Investment Name	Programs	INVP #	Bill Pool	In Service Date	Amortization Period	Inception To Date + FY 18	FY 19 CAPEX	FY 20 CAPEX	FY 21 CAPEX	Total US CapEx Spend
SAP and Application Integration Development- Release 3-1	GBE- Information Services Enabling		G210	3/1/20	120	-	-	\$5,915	-	\$55,915
Test Automation Implementation	GBE- Information Services Enabling		G210	3/1/20	120	-	-	1,031,843	-	\$1,031,843
Development Operations & BPA Enablement-4	GBE- Information Services Enabling		G210	12/1/20	120	490,349	1,034,882	763,643	288,018	\$2,577,052
SAP and Application Integration Development- Release 1-4	GBE- Information Services Enabling		G210	3/1/21	120	-	-	-	2,176,436	\$2,176,436
Development Operations & BPA Enablement-4	GBE- Information Services Enabling		G210	3/1/21	120	-	-	-	600,000	\$600,000
Development Operations & BPA Enablement-4	GBE- Information Services Enabling		G210	3/1/21	120	-	-	-	2,326,606	\$2,326,606
Development Operations & BPA Enablement-4	GBE- Information Services Enabling		G210	3/1/21	120	-	-	-	952,793	\$952,793
Development Operations & BPA Enablement-4	GBE- Information Services Enabling		G210	3/1/18	120	1,648,919	-	-	-	\$1,648,919
Development Operations & BPA Enablement-4	GBE- Information Services Enabling		G210	3/1/18	120	1,988,277	-	-	-	\$1,988,277
Development Operations & BPA Enablement-4	GBE- Portfolio Office		G210	3/1/19	120	-	2,144,482	-	-	\$2,144,482
Development Operations & BPA Enablement-4	GBE- Portfolio Office		G210	3/1/19	120	-	3,964,632	-	-	\$3,964,632
Development Operations & BPA Enablement-4	GBE- Portfolio Office		G210	3/1/20	120	-	-	2,161,221	-	\$2,161,221
Development Operations & BPA Enablement-4	GBE- Portfolio Office		G210	3/1/20	120	-	-	2,824,290	-	\$2,824,290
Development Operations & BPA Enablement-4	GBE- Regulatory and Compliance		G210	3/1/21	120	-	-	-	1,855,901	\$1,855,901
Development Operations & BPA Enablement-4	GBE- Regulatory and Compliance		G210	9/1/19	120	750,000	1,500,000	750,000	-	\$3,000,000
Development Operations & BPA Enablement-4	GBE- Supply Chain		G210	3/1/19	120	-	565,045	-	-	\$565,045
Development Operations & BPA Enablement-4	GBE- Supply Chain		G210	3/1/20	120	-	-	235,258	-	\$235,258
Development Operations & BPA Enablement-4	GBE- Work Management		G210	12/1/17	120	3,004,085	-	-	-	\$3,004,085
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/18	120	234,013	-	-	-	\$234,013
Development Operations & BPA Enablement-4	GBE- Work Management		G210	7/1/18	120	7,001,291	17,676,960	1,801,402	-	\$26,479,653
Development Operations & BPA Enablement-4	GBE- Work Management		G210	11/1/18	120	-	-	-	-	\$1,658,439
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/19	120	-	1,658,439	-	-	\$1,658,439
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/19	120	2,366,167	-	-	-	\$2,366,167
Development Operations & BPA Enablement-4	GBE- Work Management		G210	10/1/19	120	1,372,110	-	-	-	\$1,372,110
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/19	120	1,372,110	-	-	-	\$1,372,110
Development Operations & BPA Enablement-4	GBE- Work Management		G210	10/1/19	120	1,101,154	8,895,256	10,288,028	-	\$20,374,438
Development Operations & BPA Enablement-4	GBE- Work Management		G198	10/1/19	120	641,390	4,786,753	5,539,707	-	\$10,978,850
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/20	120	-	-	595,004	-	\$595,004
Development Operations & BPA Enablement-4	GBE- Work Management		G210	6/1/20	120	-	-	915,441	1,031,426	\$1,946,867
Development Operations & BPA Enablement-4	GBE- Work Management		G210	9/1/20	120	-	1,832,544	7,167,604	10,718,366	\$19,718,534
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/21	120	-	-	-	155,062	\$155,062
Development Operations & BPA Enablement-4	GBE- Work Management		G210	5/1/21	120	-	-	-	1,708,505	\$1,708,505
Development Operations & BPA Enablement-4	GBE- Work Management		G210	6/1/21	120	-	-	-	3,134,061	\$3,134,061
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/1/22	120	-	-	346,828	2,984,574	\$3,331,402
Development Operations & BPA Enablement-4	GBE- Work Management		G210	3/31/19	84	1,200,000	800,000	-	-	\$2,000,000
Development Operations & BPA Enablement-4	Growth Play Book- CXT	4426	C175	6/1/19	84	1,000,000	6,000,000	1,500,000	-	\$8,500,000
Development Operations & BPA Enablement-4	Growth Play Book- Finance	4427	C175	6/1/19	84	-	1,540,000	-	-	\$1,540,000
Development Operations & BPA Enablement-4	Growth Play Book- Finance	4217	G020	3/31/19	84	-	4,643,000	-	-	\$4,643,000
Development Operations & BPA Enablement-4	Growth Play Book- Finance	4563	G020	3/31/19	84	-	1,315,000	-	-	\$1,315,000
Development Operations & BPA Enablement-4	NY REV/grd modernization	4730	5210E	5/31/17	36	3,429,633	-	-	-	\$3,429,633
Development Operations & BPA Enablement-4	NY REV/grd modernization	4730	C113	9/31/18	84	8,652,000	-	-	-	\$8,652,000
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704K	G	9/31/18	84	-	11,427,818	-	-	\$11,427,818
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704D	C113	3/31/19	84	-	915,837	-	-	\$915,837
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704I	5210E	3/31/19	84	-	1,580,151	-	-	\$1,580,151
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704A	5210E	3/31/19	84	-	1,764,000	-	-	\$1,764,000
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704A	C113	3/31/20	84	-	5,319,147	2,756,391	-	\$8,075,538
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704C	C113	3/31/20	84	-	3,072,759	-	-	\$3,072,759
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704I	5210E	3/31/20	84	-	1,409,719	-	-	\$1,409,719
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704O	5210E	3/31/20	84	-	500,000	1,100,000	-	\$1,600,000
Development Operations & BPA Enablement-4	NY REV/grd modernization	DRMS for C&I Demand Response (Renewal)	5210E	5/1/20	12	-	-	-	1,200,000	\$1,200,000
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704F	5210E	9/30/20	84	-	9,120,628	5,714,643	-	\$14,835,271
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704G	5210E	3/31/21	84	-	9,345,188	12,966,609	6,917,501	\$29,229,298
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704I	5210E	3/31/21	84	-	-	-	1,962,336	\$1,962,336
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704J	5210E	3/31/21	84	-	1,690,216	2,765,598	490,757	\$4,946,571
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704L	5210E	3/31/21	84	-	3,762,093	6,155,240	1,092,530	\$11,009,664
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704L	5210E	3/31/21	84	-	1,720,346	1,009,376	649,100	\$3,378,822
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704L	5210E	3/31/21	84	-	8,395,335	4,528,129	3,169,136	\$16,096,601
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704M	C113	3/31/21	84	-	2,111,345	-	-	\$2,111,345
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704M	5210E	3/31/21	84	-	3,531,272	-	-	\$3,531,272
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704N	C113	3/31/21	84	-	6,514,334	3,195,298	1,931,430	\$11,641,062
Development Operations & BPA Enablement-4	NY REV/grd modernization	4704N	5210E	3/31/21	84	-	9,771,502	4,792,946	2,747,131	\$17,311,579
Development Operations & BPA Enablement-4	Other Mandates	4400	G020	12/31/17	84	1,126,000	-	-	-	\$1,126,000
Development Operations & BPA Enablement-4	Other Mandates		G020	3/31/18	84	5,071,622	-	-	-	\$5,071,622
Development Operations & BPA Enablement-4	Other Mandates	4479	G020	5/1/18	84	2,455,000	545,000	-	-	\$3,000,000
Development Operations & BPA Enablement-4	Other Mandates		G020	3/31/19	84	-	18,595,000	-	-	\$18,595,000
Development Operations & BPA Enablement-4	Other Mandates		G020	3/31/20	84	-	-	20,000,000	-	\$20,000,000
Development Operations & BPA Enablement-4	Other Mandates		G020	3/31/21	84	-	-	-	20,000,000	\$20,000,000

Investment Name	Programs	INVP #	Bill Pool	In Service Date	Amortization Period	Inception To Date + FY 18	FY 19 CAPEX	FY 20 CAPEX	FY 21 CAPEX	Total US CapEx Spend
CPE Buyback	Tech. Modernization	4684	G020	3/31/17	84	5,140,000	-	-	-	\$5,140,000
Active Directory Improvements	Tech. Modernization	4489	G020	11/30/17	84	275,000	-	-	-	\$275,000
Application Performance Management (APM)	Tech. Modernization	4490	G020	1/31/18	84	375,000	-	-	-	\$375,000
RAS/VPN Re-Platform/Mobile	Tech. Modernization	4269	G020	3/16/18	84	600,000	-	-	-	\$600,000
US Network Programme	Tech. Modernization	4496	G020	3/31/18	84	3,025,000	-	-	-	\$3,025,000
US VSTIG Programme	Tech. Modernization	4498	G020	3/31/18	84	2,700,000	-	-	-	\$2,700,000
US Wireless Programme	Tech. Modernization	4499	G020	3/31/18	84	1,500,000	-	-	-	\$1,500,000
US VSTIG Programme	Tech. Modernization	4493	G020	3/31/18	84	1,450,000	-	-	-	\$1,450,000
US Wireless Programme	Tech. Modernization	4493	G020	3/31/18	84	450,000	-	-	-	\$450,000
BSA Re-platforming	Tech. Modernization	4270	G020	3/31/18	84	280,000	-	-	-	\$280,000
Cloud Broker - Hybrid Enablement	Tech. Modernization	3899	G020	3/31/18	84	250,000	-	-	-	\$250,000
Office 2010 Upgrade	Tech. Modernization	4265	G020	3/31/18	84	800,000	-	-	-	\$800,000
Citrix Infrastructure Upgrade (Xenapp and NetScaler)	Tech. Modernization	4279	G020	3/31/18	84	500,000	-	-	-	\$500,000
Business Innovation Projects 1	Tech. Modernization	4707	G020	3/31/18	84	3,368,613	-	-	-	\$3,368,613
Data Security	Tech. Modernization	4710	G020	3/31/18	84	1,575,000	-	-	-	\$1,575,000
Orchestration and Self Service	Tech. Modernization	4726	G020	3/31/18	84	750,000	-	-	-	\$750,000
Virtual Desktop - DaaS	Tech. Modernization	4727	G020	3/31/18	84	550,000	-	-	-	\$550,000
SCL connections	Tech. Modernization	4495	G020	3/31/18	84	100,000	-	-	-	\$100,000
US SAP: Dynamic Storage Tiering	Tech. Modernization	4560	G020	7/5/18	84	-	1,355,000	-	-	\$1,355,000
ICE Replacement	Tech. Modernization	4491	G020	10/31/18	84	3,316,000	-	-	-	\$3,316,000
US Network Programme	Tech. Modernization	4496	G020	3/31/19	84	-	2,075,000	-	-	\$2,075,000
US VSTIG Programme	Tech. Modernization	4498	G020	3/31/19	84	-	1,700,000	-	-	\$1,700,000
US Wireless Programme	Tech. Modernization	4499	G020	3/31/19	84	-	1,500,000	-	-	\$1,500,000
Data Visualisation Expansion	Tech. Modernization	4496	G020	3/31/19	84	-	2,800,000	-	-	\$2,800,000
US VSTIG Programme	Tech. Modernization	4493	G020	3/31/19	84	-	2,000,000	-	-	\$2,000,000
US Wireless Programme	Tech. Modernization	4493	G020	3/31/19	84	-	1,000,000	-	-	\$1,000,000
US VSTIG Programme	Tech. Modernization	4493	G020	3/31/19	84	-	500,000	-	-	\$500,000
Mobile Broadband POC	Tech. Modernization	4723	G020	3/31/19	84	-	300,000	-	-	\$300,000
FY19 Edge Projects	Tech. Modernization	4717	G020	3/31/19	84	-	1,000,000	-	-	\$1,000,000
Digital Asset Management (DAM)	Tech. Modernization	4711	G020	3/31/19	84	-	500,000	-	-	\$500,000
Business Innovation Projects 1	Tech. Modernization	4707	G020	3/31/19	84	-	3,973,236	-	-	\$3,973,236
Business Innovation Projects 2	Tech. Modernization	4728	G020	3/31/19	84	-	3,368,613	-	-	\$3,368,613
EUC, network, and data center strategy	Tech. Modernization	4715	G020	3/31/19	84	771,429	-	-	-	\$1,542,858
Data Security	Tech. Modernization	4710	G020	3/31/19	84	-	1,575,000	-	-	\$1,575,000
FY19 Data Centre Projects	Tech. Modernization	4716	G020	3/31/19	84	-	2,000,000	-	-	\$2,000,000
13/27 Interfaces - 525 FTS, 340 RDX, 245 MQSI, 253 JCAPS, 44 PM4D, 7 VB	Tech. Modernization	4706	G020	3/31/19	84	2,600,000	-	-	-	\$2,600,000
US Video Conference Programme	Tech. Modernization	4497	G020	6/1/19	84	200,000	1,550,000	100,000	-	\$1,650,000
US VSTIG Programme	Tech. Modernization	4563	G020	3/31/20	84	-	200,000	2,000,000	-	\$2,200,000
US VSTIG Programme	Tech. Modernization	4496	G020	3/31/20	84	-	3,495,000	5,328,000	-	\$8,823,000
US VSTIG Programme	Tech. Modernization	4498	G020	3/31/20	84	-	-	700,000	-	\$700,000
US VSTIG Programme	Tech. Modernization	4499	G020	3/31/20	84	-	-	1,500,000	-	\$1,500,000
Monitoring and Alerting	Tech. Modernization	4261	G020	3/31/20	84	-	-	1,000,000	-	\$1,000,000
Service Now - Release 3	Tech. Modernization	4261	G020	3/31/20	84	400,000	-	-	-	\$3,400,000
FY20 Edge Projects	Tech. Modernization	4720	G020	3/31/20	84	-	-	2,000,000	-	\$2,000,000
FY20 Network Projects	Tech. Modernization	4721	G020	3/31/20	84	-	-	4,000,000	-	\$4,000,000
EMM Licenses	Tech. Modernization	4713	G020	3/31/20	84	-	-	660,000	-	\$1,320,000
Business Innovation Projects 2	Tech. Modernization	4708	G020	3/31/20	84	-	-	3,973,236	-	\$3,973,236
Business Innovation Projects 3	Tech. Modernization	4728	G020	3/31/20	84	-	-	3,979,236	-	\$3,979,236
Data Security	Tech. Modernization	4710	G020	3/31/20	84	-	-	1,575,000	-	\$1,575,000
Hardware and Software Upgrades	Tech. Modernization	4722	G020	3/31/20	84	500,000	6,000,000	1,000,000	-	\$7,500,000
Data Centre Consolidation efforts	Tech. Modernization	4709	G020	3/31/20	84	2,000,000	-	-	-	\$4,000,000
FY20 Data Centre Projects	Tech. Modernization	4719	G020	3/31/20	84	-	-	4,000,000	-	\$4,000,000
Enterprise Data Management Platform	Tech. Modernization	4582	G020	6/1/20	84	-	2,500,000	-	-	\$4,750,000
Business Innovation Projects 2	Tech. Modernization	4708	G020	3/31/21	84	-	-	1,230,000	-	\$4,491,484
Business Innovation Projects 3	Tech. Modernization	4728	G020	3/31/21	84	-	-	-	-	\$4,491,484

Testimony of the Information Services Panel

Exhibit __ (ISP-4)

IS Technology Modernization projects and customer benefits

TECHNOLOGY MODERNIZATION INVESTMENTS

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
Business Innovation Projects 4707 4708 4728	April 2018 April 2019 April 2020	<p>The Business Innovation Projects will deliver the following:</p> <ul style="list-style-type: none"> • Big Data Analytics – Set up data lake and Company-wide analytics capability • Data cleansing for reporting and data standards compliance; enable Business Message Standards (BMS) to enable safe and secure e-commerce • Data visualization and online interactive dashboards for quick decision making • Process and workflow automation with robotics • Customer Relationship Management (CRM) and Software as a Service (“SaaS”) capability for future customer experience program • CIS system upgrade pilots • Rate engine upgrades • Call center capability enhancements for chat, automated agents, and multichannel problem solving capability • Consumer document management and process simplification • Engineering systems upgrades • Network and connectivity upgrades for field force, yards and trucks • Mobile device capability enhancements with mobile access for applications • Increased collaboration with Office 365, Box and One Drive, a work anywhere, anytime, any device • Video collaboration for office workers, field force and flexible workers/ contractors

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4564 - US SAP: Enhancement Pack 9 Upgrade	March 2020	<p>The Upgrade Project will apply the latest SAP service packs for Enterprise Central Component (ECC) , Supplier Relationship Management (SRM) , Process Integration (PI) , Portal, Business Planning and Consolidation (BPC) and Solution Manager to ensure that the SAP application stays within current vendor support and mitigates the risk of system failure by remaining current every two years on the SAP core application.</p> <ul style="list-style-type: none"> • More reliable procurement, vendor management, inventory management, general ledger, financial reporting, system monitoring, and interface integration, closing and business reporting processes. • More stable and reliable core SAP solution, reduced On-line Service System OSS messages and associated OSS note patches, opportunity for the elimination of custom code included in upgrade pack and faster SAP vendor resolution times for production problems and situations.
4499 – US Wireless Program	April 2018 April 2019 April 2020	<ul style="list-style-type: none"> • The US Wireless Program consists of the following projects: <ul style="list-style-type: none"> • Wireless Bridge Replacements • Wireless LAN Expansion • Wireless LAN Mgmt. Tools • Wireless Network Expansion • This program will expand the current coverage and capacity of the Wireless Local Area Network (WLAN) at various National Grid sites that have been identified as a priority. In addition, this implementation will strengthen the resilience of the WLAN by providing additional corporate and guest network Data Center infrastructure. • National Grid yards have become dependent on the use of WLANs for communications to their vehicles, and many of these WLAN access points are no longer supported and are at risk of failure.
4710 – Data Security	April 2018 April 2019 April 2020	<ul style="list-style-type: none"> • This project is based around a move to protect data through information rights management and advanced cyber protection both for end points and cloud services. The project will be delivered using Microsoft Secure Productive Enterprise Plan E5, another SAAS based subscription product.

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4491 – Office 365 (ICE Replacement)	October 2018	<ul style="list-style-type: none"> • This investment is required to replace the current instant messaging, collaboration, and email (ICE) services with a set of similar, or enhanced, services provided by Office 365. The current ICE platform cannot support the business demand due to limitations in the current functionality and the inability of the current service to be upgraded. • Enhanced storage capability – Office 365 uses cloud based storage, giving ability to share large files securely, benefitting email and SharePoint services. • Network File Share – E3 license option gives potential to unlimited storage, increasing collaboration • Archiving solution – Global information records management (GIRM) has requirements to archive the information as per data protection act and regulations. Office 365 E3 licenses provide user friendly and common solution for archiving • Mobility – Office 365 is designed to support mobility whether by smartphone, tablet or PC • External collaboration – Office 365 is designed to support external collaboration across all services • Social collaboration – The social collaboration features of Office 365 ensure employees feel more involved leading to improvements in employee engagement • Agile Task Management – Office 365 has an internal planner service which eliminates the need to purchase an agile task management solution (e.g. Trello) • Future desktop office upgrades – E3 licenses come with Pro Plus, helping mitigate future upgrade costs of Office 2010 • Potential for future capabilities – Office 365 has many additional features which can be implemented to add further value as required

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4496 – US Network Program	April 2018 April 2019 April 2020	<ul style="list-style-type: none"> • The US Network Program consists of the following projects: <ul style="list-style-type: none"> • Network Data Center • Network Improvement Utilization Monitoring with NG Portal • Network Mgmt. Portal • Network Technology Refresh • Network Transformation Completion - CEMS • Provision of a fit for purpose network - Legacy network infrastructure no longer meets the functional requirements of business users. • Provision of a fully supported reliable network - Removes reliance on aged infrastructure that doesn't meet specifications and is no longer supported, ensuring that the network continues to be reliable and fit for purpose.
4722 - Hardware & Software Upgrades	April 2020	<ul style="list-style-type: none"> • This project will perform necessary upgrades for hardware refresh and testing for hardware refresh and hardware and software implementation.
FY19 Data Center Projects & FY 20 Data Center Projects 4716 4719	April 2019 April 2020	<ul style="list-style-type: none"> • Replacement of legacy aging equipment that are running critical applications in legacy data centers. • In addition, the expectation is that there will be some services retained in these data centers using the aged infrastructure.

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4498 – US VSTIG Program	April 2018 April 2019 April 2020	<ul style="list-style-type: none"> • The US VSTIG Program consists of the following projects: <ul style="list-style-type: none"> • US DMZ Risk Avoidance • VSTIG Hardware Refresh • VSTIG Infrastructure Refresh • VSTIG Inter-Regional Load Balance • VSTIG Log Logic Refresh • VSTIG Upgrade • This program will upgrade the network infrastructure and bandwidth of the Internet gateway (VSTIG – Verizon Telecommunications Secure Internet Gateway). This will mitigate the existing risk associated with the amount of bandwidth already in use and provide room for growth for new services and future projects which have a requirement to use additional bandwidth that cannot be provided due to current network hardware limitations and bandwidth utilization in the existing VSTIG. • This program is an enabler for projects that require additional bandwidth. Mitigates risk of poor performance of internet connections as network reaches full capacity. Mitigates of risk of internet service failure as a result of VSTIG data center failure.
FY 19 Network Projects & FY 20 Network Projects 4718 4721	April 2019 April 2020	<ul style="list-style-type: none"> • The hardware and software that make up the legacy network services is now experiencing asset health related issues, which have an operational and business risk of hardware/service failure, performance deterioration and potential of business service interruption. These projects will address these issues.
4706 - 1327 Interfaces - 523 FTS, 340 RDX, 245 MQSI, 253 JCAPS, 44 PM4D, 7 VB	April 2019	<ul style="list-style-type: none"> • The primary driver for this project is to mitigate the risks associated with continuing to be reliant on out of support infrastructure. These risks are : <ul style="list-style-type: none"> • Increased security risk as out of support infrastructure will not receive security patches. • The new technology will provide improvements in data and file transfer. • The strategy roadmap for middleware that supports file transfers is SAP PI and Oracle Fusion. Work is required to migrate interfaces from legacy services to strategic services and decommission the legacy services.

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4606 – Data Visualization Expansion	April 2019	<ul style="list-style-type: none"> • This investment will expand the use of tableau across more use cases across business areas and identify requirements for reporting, configuring and building reports. • Provides data, visualizations and analytics to provide invaluable insights for both operational and strategic decision making in how we use our resources. • Creates the ability to discover hidden savings potential by visualizing consumption data of many different resources.
4562 - US SAP: Business Warehouse (BW) Consolidation to HANA Enterprise Cloud (HEC)	April 2019	<ul style="list-style-type: none"> • This investment is to consolidate National Grid Business Intelligence (BI) / Business Warehouse (BW) to HANA Enterprise Cloud (HEC).: • Consolidates the reporting solutions onto a single platform to reduce costs, including infrastructure hosting and application support costs. • Simplifies the reporting solution for the business users. • Increases cross functional reporting capabilities.
4261 – Service Now – Release 3	April 2020	<ul style="list-style-type: none"> • Ongoing improvements to SMI (Service Management Integration) processes, including the extension of channels available for contacting help desk and resolving issues. • Improves reliability of support processes. Improving management of IS related issues.
4497 – US Video Conference Program	June 2019	<ul style="list-style-type: none"> • The US Video Conference Program consists of the following projects: <ul style="list-style-type: none"> • Cisco Collaboration Meeting Rooms (CMR) Implementation • Collaboration Room Upgrade • Legacy IP Unit Upgrades • Legacy ISDN Unit Upgrades • Syracuse A39/40 Upgrades • Room Upgrades <p>This program proposes that NG review the VC support provided by Verizon and make improvements in delivery and end to end reporting.</p>

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4582 – Enterprise Data Mgmt. Platform	June 2020	<ul style="list-style-type: none"> • Evaluation, selection and provision of an Enterprise Data Management platform that will provide Data Quality Management (DQM), Export Transport and Load (ETL), and Master Data Management (MDM) services. • This platform will provide US enterprise services for customer, GAs, and electric business domains. • This project will implement the data management platform in four major stages: building initial platform and data management tools; building ETL tool; building MDM hub; and integrating hub with National Grid systems and master records within the hub. • For business benefits to be realized, subsequent applications such as GBE, will integrate and utilize the platform. Future analytic systems and BI tools will integrate with the platform to realize the benefits of more accurate and complete reporting.
4560 - US SAP: Dynamic Storage Tiering	July 2018	<ul style="list-style-type: none"> • The HANA reporting environment is currently constrained, due to infrastructure and licensing agreements to 2 TB of in-memory storage. This investment is to implement dynamic tiering, which would allow HANA to scale so that it can handle the increasingly growing data volumes from Enterprise Central Component (ECC), Powerplan and other source systems. This project will provide options for storing data based on access, frequency of use and cost. • Optimizing the storage use • Increasing usage of HANA platform for business analytics and reporting • Performance improvement • Allowing non-SAP data storage in HANA for cross-functional reporting

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4493 – Monitoring and Alerting	April 2018 April 2019 April 2020	<ul style="list-style-type: none"> • Build a centralized (NG owned) Application Performance Monitoring (APM) platform to collect, present and store data from an end user experience. • Step-change reduction in incident MTTR (Mean Time To Recover) • Earlier detection of performance issues • Fewer false alarms • Faster identification of fault domain (server/citrix/network etc.) • Faster diagnosis of faults • Real-time dashboards shared will build transparency, show good performance, and true scale of slowdowns/outages • Ability to trace individual user performance history will allow validation of anecdotes
4709 – Data Center Consolidation Efforts	April 2020	<ul style="list-style-type: none"> • Some physical legacy data centers have to be retained while remediation work is carried out on these applications (retained apps). Once all retained applications are remediated and moved to the new data center, the legacy data centers will need to be decommissioned.
4715 – EUC, Network and Data Center Strategy	April 2019	Piece of strategy work to assess the current state and plan against the demands to determine whether the IS strategies and plans support achievement of those business strategies.
FY 19 & FY 20 Edge Projects 4717 4720	April 2019 April 2020	<ul style="list-style-type: none"> • As we use more cloud based services that dictate the pace of change, we will need new capability to manage this impact on National Grid. This includes services to manage the change as well as reduce complexity in estate to reduce impact of changes. As we move to any device working in the cloud, our focus will change from end points and applications to data and the need to protect the data regardless of where it resides. • Includes providing end user devices to employees, and refresh and management of existing devices in new ways to react to the merging of mobile and PC worlds.

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4265 – Office 2010 Upgrade	April 2018	<ul style="list-style-type: none"> • Upgrade of Office 2010 software will bring improved features, improved security, and support for real time collaboration of documents as well as better cloud integration.
4726 – Orchestration and Self Service	April 2018	<ul style="list-style-type: none"> • The provisioning of strategic cloud provider(s) will reduce the number of cloud-hosting environment that will need integration. • time to market, cost and complexity for enterprise services such as the Strategic Analytics Platform, Mobile Application Development Environment, etc. • Creates the strategy that will build the processes used by these cloud services, along with the ability to self-provision resources.
4727 – Virtual Desktop - DaaS	April 2018	<ul style="list-style-type: none"> • To implement a desktop as a service (DaaS) offering that is a virtual desktop infrastructure (VDI) hosted by a third-party cloud service provider. DaaS utilizes a multi-tenancy architecture, which means that a single instance of an application is served to multiple users, referred to as "tenants." The service provider is responsible for managing the cloud and the underlying infrastructure. The level of service will vary depending on the company needs.
4269 – RAS/VPN Re-Platform/Mobile	March 2018	<ul style="list-style-type: none"> • The original Juniper Remote Access SSL VPN (RAS) deployed by Verizon is now five years old and doesn't support some of the latest mobile capability or integrate easily with other technologies that have been implemented (Cisco ISE). This Project proposes to replace the existing RAS VPN solution with a more modern platform that has improved mobile VPN capability and improved integration with National Grid technologies. • Enables better mobile support - Mobile VPN capability to support deployment and use of mobile applications • Improves user experience with additional VPN connection modes • Integration with Identity Services Engine (ISE)

Project/INVP #	In Service Date(s)	Description of Project/Customer Benefits
4713 – EMM Licenses	April 2020	The Enterprise Mobile Management System (EMM) project will secure corporate data and information stored on mobile devices, mainly by ensuring that policies are enforced on the device. This project will procure the necessary licenses to manage these mobile devices.
4684 – CPE Buyback	March 2017	<ul style="list-style-type: none"> • The project will purchase the Cisco assets that are currently leased from Verizon. • Facilitates revisions to supplier arrangements/renegotiations as Verizon contract expires <ul style="list-style-type: none"> ○ Opens opportunity to coordinate Cisco to support future services and innovation.
All Other – 11 Tech Mod investments with an NMPC Allocation impact of less than \$0.1M each	Various	<ul style="list-style-type: none"> • Includes the following projects <ul style="list-style-type: none"> • Active Directory Improvements • Application Performance Management (APM) • Citrix Infrastructure Upgrade (Xenapp and NetScaler) • Cloud Broker - Hybrid Enablement • Digital Asset Management (DAM) • Improving End User Experience- Cloud based DMZ Service Platform • IS Tools • Mobile Broadband POC • MWORK and Netmotion Risk Avoidance • RSA Re-platform • SCI connections

Testimony of the Information Services Panel

Exhibit __ (ISP-5)

National Grid's cyber security IS projects

CYBER SECURITY IS INVESTMENTS

Cyber Security Investments Prior to Rate Year (After Historic Test Year)

Project/INVP #	In Service Date	Program	Description of Project/Customer Benefits
Enterprise Network Security	June 2017	Cyber Security 1 Program (Original Scope)	Implementation of an automated and centralized Enterprise Network Security providing National Grid with analytical information and capability to identify areas of risks that require action and adequately protect business operations from threats.
CNI Network Security	December 2017	Cyber Security 1 Program (Original Scope)	CNI (Critical Network Infrastructure) Network Security will reinforce and strengthen security capabilities of current US CNI environments to mitigate external and internal threats to CNI operations.
CNI SIEM	December 2017	Cyber Security 1 Program (Original Scope)	CNI SIEM will incorporate logs from critical applications in the CNI environment into the Cyber Security Operations center and deliver threat correlation and security analytics capabilities to enhance protection of assets in the CNI environment.
Security Services Network (SSN)	December 2017	Cyber Security 1 Program (Re-sanctioned Scope)	The SSN will deliver a secured network segment comprising of different network zones to ensure that the security solutions are provisioned in accordance with industry best practice and National Grid policies and standards. This network will facilitate management of the security solutions, securing and segregating CNI security information on its own network.
Migration of Enterprise Network Security (ENS) capabilities to SSN	December 2017	Cyber Security 1 Program (Re-sanctioned Scope)	This project will enable Enterprise Network Security tools and solutions to be expanded to collect the CNI network security data and be migrated on to the SSN.
Cloud Security	May 2017	Cyber Security 2 Program	The project will deliver an enterprise capability to gain visibility into the use and risk of cloud services, detect threats, and seamlessly enforce security, compliance, and governance policies. This solution will provide enterprise business capabilities to help identify and understand cyber risk of all cloud services in use; ensure authorized users can access data stored in the cloud; monitor cloud activity, detect compromised user accounts and insider threats; avoid costly fines and reduce reputational risk by continuously monitoring cloud data usage.

Project/INVP #	In Service Date	Program	Description of Project/Customer Benefits
Threat Behavior Modeling	August 2017	Cyber Security 2 Program	The project will introduce user behavior analytics that will allow National Grid the capability to find unknown and hidden threats using data science, machine learning, behavior base lining, peer group analytics and advanced correlation. The capability will enable for better detection and response to variances in baseline activity, allowing for increased focus and remediation of potential attacks.
Risk Based Authentication – 2FA token alternative	June 2017	Cyber Security 2 Program	The project will enhance the capability of providing strong Risk-Based authentication using a token-less, mix and match hardware and software authenticator solution. It will introduce a new method of authentication based on a risk profile associated with a given transaction ensuring users are who they say they are and are accessing systems and information associated with their profile.
Identity & Access Management: Role Based Access Management	October 2017	Cyber Security 2 Program	Role Based Access Management (RBAC) will reduce the complexity and cost of security administration in large networked applications by grouping access into functional roles. RBAC will facilitate the management of users and their access roles in a controlled, automated and effective manner, allow for access to be limited to system applications to only authorized users and will simplify identity and access control compliance by managing access based on a user's role, rather than on an individual, user-by-user basis.
Enhanced DLP Gateway and Endpoint	December 2017	Cyber Security 2 Program	Data Loss Prevention (DLP) will enable National Grid's businesses to detect sensitive data in the organization and then be able to identify, implement, and enforce policies for protecting the data without forcing any modifications to the data. It will limit the way that an authorized user who has access to data is able to use the data. Implementation of such technology provides the business with the ability to manage and reduce the risk of information loss.

Rate Year (Cyber Security 2 Program) Investments

Project/INVP #	In Service Date	Description of Project/Customer Benefits
CSP 2: US CNI Intrusion Detection / Prevention Phase 1	April 2018	This project will ensure adequate security protection to cyber assets supporting critical reliability functions and processes across National Grid US CNI environments. The Intrusion Detection Solution (IDS) will provide the ability to monitor the host, network and/or application for malicious activity, signaling if an attack or unauthorized activity is occurring. In addition to monitoring traffic, data can be analyzed to assist in preserving the integrity of data. The solution will provide the US CNI businesses with the capability to detect abnormal patterns that deviate from normal behavior or use known patterns of unauthorized behavior to predict and detect similar attacks.
CSP 2: Identity & Access Management: Fine Grained Access Management	April 2018	Fine Grained Access Management is a more detailed level of authorization, primarily controlled by the respective application. It takes into account the protected resources and its configured policies, as well as information that may include resource-specific and user attributes and the context of the request. This will allow for better controls around user access, enforce controls on all types of business resources or assets, create role and access control policies to define constraints regarding which users are assigned roles and access to software components, distribute policies to integrated applications, and specify who can do what to which resource, when it can be done, and how.
CSP 2: vStig Scaling Upgrades	August 2018	This project will provide necessary updates to National Grids perimeter network environment, Verizon Strategic Internet Gateway (vSTIG). The updates will include enhancements to existing security capabilities that protect against an ever-changing threat landscape focused on the perimeter network. This capability will provide the US business the ability to protect its assets from any outside malicious cyber threat through the digital network overlay.
CSP 2: IT/OT Discovery and Implementation Phase 1	October 2018	This project will explore the information technology (IT) and operational technology (OT) environments to assess how best to ensure that OT systems are managed effectively, investigating the convergence, alignment, and integration with IT systems. The project will allow National Grid to assess the current risks around operational technology and be an enabler for further dialogue with the business, around best approaches to manage the growing operational technology estate and associated risks and issues. This project will ultimately allow National Grid the capabilities to discover Smart/IT/OT computing and other devices across the National Grid environment in a centralized location, allowing the business to gain a full inventory of devices/applications/technologies, determine risks associated with those components, identify relevant controls, and management of devices/applications /technologies through their lifecycle.
CSP 2: Security Research Lab	October 2018	This project will implement a National Grid Security Research Lab with a dedicated environment to performing testing and research on new technologies being introduced to the National Grid environment. The project will enable applied research focused on cyber threats and countermeasures, secure multi-level information sharing, resilient command and control network architectures, reverse engineering, information operations and exploitation, high performance computing, and data analytics. This project will ensure new technologies introduced into the National Grid environment do not introduce new vulnerabilities, as well as provide actionable information to address emerging threats.

CSP 2: US CNI Security Enhancements Phase 1	November 2018	The CNI Security enhancements are intended to help National Grid's Critical National Infrastructure businesses and support its continual efforts to maintain the safety and reliability of their operations by enhancing and building on its security and resilience within the infrastructure. These enhancements will help mitigate external and internal evolving security threats to National Grid CNI operations; ensure adequate security protection to cyber assets supporting critical reliability functions and processes; provides the ability for the business to scale and help minimize potential loss of an operations service; and potentially reduce financial penalties and reputational damage due to security breaches
---	---------------	---

Data Year (Cyber Security 2 Program) Investments

Project/INVP #	In Service Date	Description of Project/Customer Benefits
CSP 2: Identity & Access Management: Privileged Access Management	April 2019	Privileged Access Management (PAM) will provide discovery, authentication, authorization, password management with scheduled changes, auditing and compliance reporting capabilities for privileged account users. The PAM solution will allow for privileged National Grid user accounts across CNI and business systems and applications to exist in a small and controlled number. The accounts will be managed by the PAM solution, which will temporarily provision and de-provision privileged access to users and provide a detailed audit trail of privileged user actions
CSP 2: Domain Based Security Phase 1	April 2019	This project will implement a Domain-based approach to information assurance for the identification, analysis, and documentation of security issues in the enterprise. The approach describes the requirements for security in the organization, taking into account the business that needs to be supported. Security Policy Domains will establish a set of entities, physical and logical, that are subject to a common security policy and also allow each business unit to adopt a risk-based approach to the implementation of information security controls. The first phase of the project will focus on conducting risk-assessments on the different business lines, review of current policy framework, and develop more personalized, business specific policies based on business risk appetite and tolerance.
CSP 2: Security Incident Event Management Phase 4	May 2019	This project will build on the existing SIEM infrastructure implemented as part of the Cyber Security 1 Program. The initiative will focus on identification and prioritization of additional application, system, and device logs from across National Grid into the Cyber Security Operations center to contribute to the holistic, single-pane of glass view of the company's networks. SIEM 4 will deliver integration/onboarding of a subset of the identified cyber assets, with SIEM 5 delivering the rest. The project will deliver enhanced monitoring and provide log auditing and review and incident response. The project will ensure alignment with cyber security best practices and provide the CSOC and Network teams

		with actionable information to allow faster response to security incidents.
CSP 2: Big Data Security Analytics Phase 1	May 2019	This project will introduce the new business capability focused on Big Data Security Analytics. This initiative will provide the capability to examine large volumes of security related data from various sources – including traditional security sources such as log or audit files, images, social data, sensors, etc. This project will provide real-time analysis, providing prediction and mitigation means to uncover hidden threats, detect attack patterns and trends, identify suspicious anomalies, and aid in the removal of security threats.
CSP 2: US CNI Intrusion Detection / Prevention Phase 2	April 2020	This project will introduce an Intrusion Protection Solution that will operate the process of performing intrusion detection, with the added capability of attempting to prevent detected possible incidents. This capability will reduce business impact of potential intrusions by initiating timely and appropriate responses to attacks, improve the effectiveness of existing preventative controls by improving the response time to major critical events and continue compliance with laws and regulations. This project will be managed and staffed internally, and will be integrated with Cyber Security Operations Center.
CSP 2: Identity & Access Management Phase: Shared Area Access Management	April 2020	Shared Area Access Management – Project to extend the IAM solution to administer access to the various shared files areas that exist across National Grid.
CSP 2: Domain Based Security Phase 2	April 2020	The second phase of this project will build upon the efforts delivered by Domain Based Security Phase 1. Leveraging the risk assessments and resulting policies developed for National Grid, this phase will implement the specific information security controls (such as network segregation) identified by the policy and risk for each business.
CSP 2: Security Incident Event Management Phase 5	May 2020	This project is the second phase of SIEM 4 highlighted above. SIEM 5 will build on onboarding the next phase of identified application, system, and device logs from SIEM 4. The project will deliver enhanced monitoring, help manage users and service privileges, directory services and other system configuration changes; as well as provide log auditing and review and incident response. The project will ensure alignment with cyber security best practices and provide the CSOC and Network teams with actionable information to allow faster response to security incidents.

Testimony of the Information Services Panel

Exhibit __ (ISP-6)

National Grid's cyber security projections for system modernization

SYSTEM MODERNIZATION CYBER SECURITY CAPABILITIES

	Customer							Grid Mod			Telecom		Data Analytics	
	CSS Changes	Head End / MDMS	Energy Monitoring Portal	Green Button Connect	E-Commerce Marketplace	Customer Load Management	DG IOAP	DMS/DSCADA	System Data Portal	GIS Data Enhancements	Telecoms	ESB & API Integration	Plant Information Historian	Data Lake & Adv. Analytics
Network Security Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Identity & Access Management Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Host and Endpoint Security Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Security Policy Management Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Change & Configuration Management Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Application Security Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Remote Access Services		X						X			X			X
Threat and Vulnerability Management Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Security Operations Center Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Security Awareness & Training Services	X	X	X	X	X	X	X	X						
Third Party Assurance Services		X	X	X	X						X		X	X
Data Security Services	X	X	X	X	X	X								
Cryptography Services	X	X	X	X	X	X								
Privacy Services	X	X	X	X	X	X	X							X

Network Security Services

The protection of the organization's critical network infrastructure (e.g., core switches, routers, proxy gateways, etc.) against cyber-attacks. includes limiting vulnerabilities in the network infrastructure and preventing unauthorized access, misuse, modification or denial of a network resource or network itself.

Data Security Services

Provides protection of data from accidental or intentional but unauthorized modification, destruction or disclosure through the use of data protection solutions and other safeguards to ensure that confidentiality and integrity is maintained.

Identity & Access Management Services

Services provide the management of individual identities, and their authentication, authorization, and privileges/permissions within or across system and enterprise boundaries, with the goal of

increasing security and productivity while decreasing cost, downtime and repetitive tasks. Ensure that only authorized entities can access resources in the enterprise.

Security Operations Control Center Services

Provides remediation support and consultation to mitigate threats and respond to attacks. Staffed by experienced, well- trained and well-equipped security professionals. Enables faster, accurate detection and response to security incidents to protect assets.

Host & Endpoint Security Services

Monitor the state of endpoints for threat indicators, investigate events to determine severity. New smart grid technologies, and particularly smart meters, smart appliances, and similar types of endpoints, create new privacy and security risks and concerns.

Security Policy Management Services

Managing and updating policies which are required for successful implementation of security strategies within National Grid. Essential to provide management direction and support for information security in accordance with business requirements and relevant laws and regulations.

Cryptography Services

Strengthen the confidentiality and integrity of sensitive information during use, transmission, and storage. Forms the foundation of securing data in transit (secure communications) and data at rest (secure storage).

Change & Configuration Management Services

Processes by which the organization manages and documents all configuration changes to the Smart Grid information system.. Ensures that the Smart Grid's information system configuration – and the cybersecurity program in general – can only undergo approved and tested changes.

Security Awareness & Training Services

Reduce the risk of a human error resulting in security breach by ensuring that customers, employees, contractors and third party users are aware of information security policies, threats and concerns as well as their responsibilities and liabilities.

Application Security Services

Embedded within software development processes to protect the various applications that might be vulnerable to a wide variety of threats. Security measures to minimize the likelihood that unauthorized code will be able to manipulate applications to access, steal, modify or delete sensitive data.

Third Party Assurance Services

Ensure that third parties protect information under their control from unauthorized access, copying, modification, inappropriate disclosure, or loss by having information privacy protections in policies, procedures, and practices relating to data security and to disclosure and accuracy of data disclosed to the Third Party's Contracted Agents, or to other Third Parties.

Remote Access Services

Access to Smart Grid information system by a user (or process acting on behalf of a user) communicating through an external, non-organization controlled network (e.g., the Internet).

Privacy Services

Accountabilities, policies, procedures and business practices, and a fabric of technical and operational controls to manage data privacy related risks more effectively.

Testimony of the Information Services Panel

Exhibit __ (ISP-7)

Forecast of Purchased Gas Expense Rate Year and Data Years

Niagara Mohawk Power Corporation d/b/a National Grid
Incremental Operating Expenses (Opex)

Program/Release Description	Investment Name	INVP	12-Months Ending March 31, 2019	12-Months Ending March 31, 2020	12-Months Ending March 31, 2021	Total OPEX Spend
Cyber Security	IT/OT Discovery and Implementation Phase 1	3683	\$500,000	\$0	\$0	\$500,000
Cyber Security	Identity & Access Management: Privileged Access Management	3683	\$640,000	\$0	\$0	\$640,000
Cyber Security	Domain Based Security Phase 1	3683	\$200,000	\$0	\$0	\$200,000
Cyber Security	Security Incident Event Management Phase 4	3683	\$12,500	\$0	\$0	\$12,500
Cyber Security	Big Data Security Analytics Phase 1	3683	\$100,000	\$0	\$0	\$100,000
Cyber Security	Situation Intelligence & Cyber Intelligence: Phase 2	3683	\$120,000	\$0	\$0	\$120,000
Cyber Security	US CNI Intrusion Detection/Prevention Phase 2	3683	\$60,000	\$100,000	\$0	\$160,000
Cyber Security	Identity & Access Management: Shared Area Access Management	3683	\$0	\$640,000	\$0	\$640,000
Cyber Security	Security Incident Event Management (SIEM) Phase 1	3683	\$0	\$12,500	\$0	\$12,500
Cyber Security	Security Incident Event Management (SIEM) Phase 2	3683	\$0	\$0	\$12,500	\$12,500
Cyber Security	Big Data Security Analytics - Phase 2	3683	\$0	\$100,000	\$100,000	\$200,000
Cyber Security	IT/OT Discovery and Implementation: Phase 2	3683	\$0	\$500,000	\$500,000	\$1,000,000
Cyber Security	Data Visualization	3683	\$0	\$0	\$100,000	\$100,000
FY18 Plan	Gas Service Database - UNY	3949	\$15,000	\$0	\$0	\$15,000
FY18 Plan	INVP 3932 Call Center Customer Contact Center/SDC Technology Upgrade Implement Solution	3932	\$547,000	\$0	\$0	\$547,000
FY18 Plan	INVP 3737 US CNI GMS SCADA Upgrade &	3737	\$317,000	\$236,000	\$0	\$553,000
FY18 Plan	CRIS Data Archival	4485	\$200,000	\$0	\$0	\$200,000
FY18 Plan	General Ledger Interface CRIS SAI	4486	\$180,000	\$20,000	\$0	\$200,000
FY18 Plan	Informatica Upgrade/Microstrategy Replacement Program	4469	\$15,000	\$0	\$0	\$15,000
FY18 Plan	Cisco Prime	4679	\$0	\$2,000,000	\$0	\$2,000,000
FY18 Plan	Aged Printer refresh	4689	\$0	\$4,000,000	\$0	\$4,000,000
FY18 Plan	RSA Token refresh	4683	\$0	\$660,000	\$0	\$660,000
FY18 Plan	STORMS Capital Cost Estimates	4467	\$194,000	\$0	\$0	\$194,000
FY18 Plan	INVP 4408 Doc Mgmt Systems Replacement Delivery	4408	\$19,380	\$0	\$0	\$19,380
FY18 Plan	INVP 4398 Storms/ISched Upgrade	4398	\$72,000	\$0	\$0	\$72,000
FY18 Plan	US MDS-Energy Accounting System (EAS) migration to Wholesale Settlement Application (WSA)	4481	\$265,000	\$0	\$0	\$265,000
FY18 Plan	Gas Service Database - DNY (LI and NYC)	3948	\$25,000	\$0	\$0	\$25,000
FY18 Plan	Contractor Management Modernization	4151	\$825,000	\$1,290,000	\$1,215,000	\$3,330,000
FY18 Plan	Substation Monitoring-DobleARMS	3982	\$5,000	\$0	\$0	\$5,000
FY18 Plan	Customer Bill Redesign	4704Q	\$190,318	\$0	\$0	\$190,318
FY18 Plan	US CNI-EMS Lifecycle Hardware and Software Upgrade	4568	\$100,000	\$0	\$0	\$100,000
Growth Play Book	Customer Experience Transformation-Communication Preference Manager	4426	\$704,000	\$0	\$0	\$704,000
Growth Play Book	US SAP: Business Planning	4217	\$280,000	\$0	\$0	\$280,000
Growth Play Book	US SAP: FERC on Hana (FOH)	4563	\$280,000	\$290,000	\$260,000	\$830,000
Growth Play Book	Governance Risk & Compliance (GRC) Optimization/Upgrade	4222	\$160,000	\$140,000	\$0	\$300,000
Other Mandates	Regulatory Mandates - FY19		\$6,000,000	\$0	\$0	\$6,000,000
Other Mandates	Regulatory Mandates - FY20		\$0	\$6,000,000	\$0	\$6,000,000
Other Mandates	Regulatory Mandates - FY21		\$0	\$0	\$6,000,000	\$6,000,000
Other Mandates	US Control-Gas Electronic Bulletin Board (EBB) Upgrade	4479	\$193,000	\$0	\$0	\$193,000
PSC Mandate	INVP 4411D New Gas Connections	4411D	\$136,000	\$0	\$0	\$136,000
Tech. Modernization	US SAP: Enhancement Pack 9 Upgrade	4564	\$2,427,000	\$592,000	\$0	\$3,019,000
Tech. Modernization	Enterprise Data Management Platform	4582	\$450,000	\$450,000	\$450,000	\$1,350,000
Tech. Modernization	US Network Program	4496	\$410,000	\$0	\$0	\$410,000
Tech. Modernization	US Network Program	4496	\$0	\$70,000	\$0	\$70,000
Tech. Modernization	US VSTIG Program	4498	\$50,000	\$0	\$0	\$50,000
Tech. Modernization	US Wireless Program	4499	\$50,000	\$0	\$0	\$50,000
Tech. Modernization	US Wireless Program	4499	\$0	\$50,000	\$0	\$50,000
Tech. Modernization	Data Visualization Expansion	4606	\$810,000	\$0	\$0	\$810,000
Tech. Modernization	US SAP: Business Warehouse (BW) Consolidation to HANA Enterprise Cloud (HEC)	4562	\$810,000	\$0	\$0	\$810,000
Tech. Modernization	US Video Conference Program	4497	\$590,000	\$10,000	\$0	\$600,000
Tech. Modernization	US SAP: Dynamic Storage Tiering	4560	\$464,000	\$0	\$0	\$464,000
Tech. Modernization	Monitoring and Alerting	4493	\$50,000	\$0	\$0	\$50,000
Tech. Modernization	Monitoring and Alerting	4493	\$0	\$50,000	\$0	\$50,000
Tech. Modernization	Service Now - Release 3	4261	\$20,000	\$0	\$0	\$20,000
Tech. Modernization	IS Tools	4513	\$400,000	\$0	\$0	\$400,000
Tech. Modernization	MWORK and Netmotion Risk Avoidance	4725	\$20,000	\$0	\$0	\$20,000
Tech. Modernization	Improving End User Experience- Cloud based DMZ Service Platform	4723	\$50,000	\$0	\$0	\$50,000
Tech. Modernization	Mobile Broadband POC		\$20,000	\$0	\$0	\$20,000
Tech. Modernization	FY20 Edge Projects	4720	\$0	\$1,000,000	\$0	\$1,000,000
Tech. Modernization	Business Innovation Projects 1	4707	\$794,647	\$0	\$0	\$794,647
Tech. Modernization	Business Innovation Projects 2	4708	\$673,723	\$0	\$0	\$673,723
Tech. Modernization	Business Innovation Projects 2	4708	\$0	\$794,647	\$0	\$794,647
Tech. Modernization	Business Innovation Projects 2	4708	\$0	\$0	\$898,297	\$898,297
Tech. Modernization	Business Innovation Projects 3	4728	\$673,723	\$0	\$0	\$673,723
Tech. Modernization	Business Innovation Projects 3	4728	\$0	\$794,647	\$0	\$794,647
Tech. Modernization	Business Innovation Projects 3	4728	\$0	\$0	\$898,297	\$898,297
Tech. Modernization	EUC, network, and data center strategy	4715	\$771,429	\$0	\$0	\$771,429
Tech. Modernization	Data Security	4710	\$675,000	\$0	\$0	\$675,000
Tech. Modernization	Data Security	4710	\$0	\$675,000	\$0	\$675,000
Tech. Modernization	Orchestration and Self Service	4726	\$750,000	\$750,000	\$0	\$1,500,000
Tech. Modernization	Hardware and Software Upgrades	4722	\$750,000	\$0	\$0	\$750,000
Tech. Modernization	Data Centre Consolidation efforts	4709	\$250,000	\$250,000	\$0	\$500,000
Tech. Modernization	Virtual Desktop - DataS	4727	\$500,000	\$500,000	\$0	\$1,000,000
Tech. Modernization	FY19 Data Center Projects	4716	\$250,000	\$0	\$0	\$250,000
Tech. Modernization	FY20 Data Center Projects	4719	\$0	\$500,000	\$0	\$500,000
Tech. Modernization	1327 Interfaces - 523 FTS, 340 RDX, 245 MQSI, 253 JCAPS, 44 PM4D, 7 VB	4706	\$300,000	\$0	\$0	\$300,000
Tech. Modernization	INVP4605 - IS Sourcing Renewal	4605	\$464,000	\$3,850,000	\$0	\$4,314,000
Tech. Modernization	EMM Phase2		\$200,000	\$200,000	\$0	\$400,000
Tech. Modernization	Azure Core Service Enablement		\$250,000	\$250,000	\$0	\$500,000
Total OPEX			\$26,278,720	\$26,774,794	\$10,434,094	\$63,487,608

Niagara Mohawk Power Corporation d/b/a National Grid
Incremental Run the Business (RTB) Operating Expenses

Program/Release Description	Description Of Run the Business (RTB) Costs	INVP	For 12-Months Ending	For 12-Months Ending	For 12-Months Ending	Total RTB
			March 31, 2019	March 31, 2020	March 31, 2021	
FY18 Plan	INVP 2577C ArcFM Software Upgrade	2577C	\$325,000	\$325,000	\$325,000	\$975,000
FY18 Plan	INVP 3737 US CNI GMS SCADA Upgrade &	3737	\$174,000	\$611,000	\$1,032,000	\$1,817,000
FY18 Plan	INVP 4045 Double Pole Mgmt DB	4045	\$32,000	\$32,000	\$32,000	\$96,000
FY18 Plan	INVP 4398 Storms/ISched Upgrade	4398	\$294,000	\$294,000	\$294,000	\$882,000
FY18 Plan	INVP 3486 US MDS-Iron Enterprise Edition (IEE)	3486	\$27,000	\$27,000	\$27,000	\$81,000
FY18 Plan	INVP 3932 Call Center Customer Contact Center/SDC Technology Upgrade Implement Solution	3932	\$642,000	\$642,000	\$642,000	\$1,926,000
FY18 Plan	INVP 4390 Plastic Fusion II	4390	\$264,000	\$264,000	\$270,000	\$798,000
FY18 Plan	INVP 4408 Doc Mgmt Systems Replacement Delivery	4408	\$440,000	\$1,351,000	\$440,000	\$2,231,000
FY18 Plan	INVP 4170 Time Transformation	4170	\$522,000	\$522,000	\$522,000	\$1,566,000
FY18 Plan	INVP 4420 US CNI OMSFocalPoint Infrastructure Upgrade	4420	\$90,000	\$90,000	\$90,000	\$270,000
FY18 Plan	INVP 4464 Data Visualization	4464	\$506,000	\$506,000	\$506,000	\$1,518,000
FY18 Plan	INVP 4631 Box Enablement	4631	\$572,000	\$572,000	\$572,000	\$1,716,000
FY18 Plan	US Mobile Device Refresh	4395	\$300,000	\$300,000	\$300,000	\$900,000
FY18 Plan	HRIS Simplification Program	4144	\$2,400,000	\$2,400,000	\$2,400,000	\$7,200,000
FY18 Plan	HRIS Simplification Program (Customer Benefits)		(\$1,164,360)	(\$1,164,360)	(\$1,164,360)	(\$3,493,080)
FY18 Plan	Informatics Upgrade/Microstrategy Replacement Program	4469	\$443,000	\$443,000	\$443,000	\$1,329,000
FY18 Plan	US MDS-Energy Accounting System (EAS) migration to Wholesale Settlement Application (WSA)	4481	\$275,000	\$275,000	\$275,000	\$825,000
FY18 Plan	Ageing System Stabilization/Upgrades - FY18	4389	\$200,000	\$200,000	\$200,000	\$600,000
FY18 Plan	CRIS Data Archival	4485	\$0	\$35,000	\$35,000	\$70,000
FY18 Plan	General Ledger Interface CRIS SAP	4486	\$2,000	\$6,000	\$6,000	\$14,000
FY18 Plan	Substation Monitoring-DobleARMS	3982	\$80,000	\$80,000	\$80,000	\$240,000
FY18 Plan	Gas Capital Investment Planning Tool	4466	\$112,000	\$112,000	\$112,000	\$336,000
FY18 Plan	US Control-Gas System Operating Procedure (SOP) Upgrade	4480	\$36,000	\$36,000	\$36,000	\$108,000
FY18 Plan	Computapole Enhancements to Support Inspection Types	4462	\$50,000	\$50,000	\$50,000	\$150,000
FY18 Plan	Changes to ACIS for PMCC Civil Vendor Billing	4487	\$29,000	\$29,000	\$29,000	\$87,000
FY18 Plan	Cascade Electric Application Upgrade Project	3986	\$15,000	\$15,000	\$15,000	\$45,000
FY18 Plan	Gas Service Database - UNY	3949	\$40,000	\$40,000	\$40,000	\$120,000
FY18 Plan	Gas Service Database - DNY (LI and NYC)	3948	\$15,000	\$15,000	\$15,000	\$45,000
FY18 Plan	Contractor Management Modernization	4151	\$0	\$0	\$750,000	\$750,000
FY18 Plan	WiFi for Fleet Services Diagnostic Laptops	3956	\$40,000	\$40,000	\$40,000	\$120,000
FY18 Plan	US CNI-EMS Lifecycle Hardware and Software Upgrade	4568	(\$2,000)	(\$2,000)	\$0	(\$4,000)
FY18 Plan	Travel & Expense Management (T&E) and Global Master Service Provider (MSP) Strategy	4578	\$350,000	\$350,000	\$350,000	\$1,050,000
FY18 Plan	Network Transformation Completion - CEMS	4647	\$27,200	\$27,200	\$27,200	\$81,600
FY18 Plan	Cisco Prime	4679			\$216,000	\$216,000
FY18 Plan	RSA Token refresh			\$250,000	\$0	\$250,000
FY18 Plan	Microsoft EEA Renewal	4642	\$900,000	\$900,000	\$900,000	\$2,700,000
FY18 Plan	US Video Conferencing upgrade for RW	4632	\$30,000	\$30,000	\$30,000	\$90,000
FY18 Plan	INVP4298-NY REV Clifton Park Demo Information	4298	\$52,400	\$52,400		\$104,800
FY18 Plan	INVP4394-NE Gas Leak Recheck (next Phase)	4394	\$75,000	\$75,000	\$75,000	\$225,000
FY18 Plan	Voice Recording	4473	\$300,000	\$300,000	\$300,000	\$900,000
FY18 Plan	New Medical System	3718	\$105,000	\$105,000	\$105,000	\$315,000
FY18 Plan	FERC Wholesale Customer System	4214	\$142,000	\$142,000	\$142,000	\$426,000
FY18 Plan	Nightcrawler Asset Update	4554	\$2,000	\$2,000	\$2,000	\$6,000
FY18 Plan	MaaS 360 Payoff	4682	(\$16,800)	(\$16,800)	(\$16,800)	(\$50,400)
Growth Play Book	US SAP: Business Planning	4217	\$0	\$0	\$20,000	\$20,000
Growth Play Book	US SAP: FERC on Hana (FOH)	4563	\$0	\$0	\$510,000	\$510,000
Growth Play Book	Governance Risk & Compliance (GRC) Optimization/Upgrade	4222	\$0	\$40,000	\$0	\$40,000
Other Mandates	US Control-Gas Electronic Bulletin Board (EBB) Upgrade	4479	\$779,000	\$779,000	\$779,000	\$2,337,000
PSC Mandate	INVP 4124 Auto Remote Net Meter	4124	\$30,000	\$30,000	\$30,000	\$90,000
PSC Mandate	INVP 4411D New Gas Connections	4411D	\$324,000	\$403,000	\$400,000	\$1,127,000
Tech. Modernization	US SAP: Enhancement Pack 9 Upgrade	4564	\$0	\$178,000	\$0	\$178,000
Tech. Modernization	ICE Replacement	4491	(\$1,380,200)	(\$1,499,000)	(\$1,533,000)	(\$4,412,200)
Tech. Modernization	US Network Program	4496	\$1,155,000	\$0	\$0	\$1,155,000
Tech. Modernization	US Network Program	4496	\$0	\$1,155,000	\$0	\$1,155,000
Tech. Modernization	US VSTIG Program	4498	\$120,000	\$0	\$0	\$120,000
Tech. Modernization	US VSTIG Program	4498	\$0	\$120,000	\$0	\$120,000
Tech. Modernization	US Wireless Program	4499	\$165,000	\$0	\$0	\$165,000
Tech. Modernization	US Wireless Program	4499	\$0	\$260,000	\$0	\$260,000
Tech. Modernization	Data Visualization Expansion	4606	\$640,000	\$640,000	\$640,000	\$1,920,000
Tech. Modernization	US SAP: Business Warehouse (BW) Consolidation to HANA Enterprise Cloud (HEC)	4562	\$11,000	\$43,000	\$43,000	\$97,000
Tech. Modernization	US Video Conference Program	4497	\$520,000	\$370,000	\$0	\$890,000
Tech. Modernization	US SAP: Dynamic Storage Tiering	4560	\$177,000	\$236,000	\$236,000	\$649,000
Tech. Modernization	Monitoring and Alerting	4493	\$75,000	\$0	\$0	\$75,000
Tech. Modernization	Monitoring and Alerting	4493	\$0	\$75,000	\$0	\$75,000
Tech. Modernization	Service Now - Release 3	4261	\$150,000	\$150,000	\$0	\$300,000
Tech. Modernization	IS Tools	4513	\$100,000	\$160,000	\$160,000	\$420,000
Tech. Modernization	Application Performance Management (APM)	4490	\$75,000	\$75,000	\$0	\$150,000
Tech. Modernization	RSA Re-platform	4270	\$150,000	\$150,000	\$150,000	\$450,000
Tech. Modernization	FY20 Edge Projects	4720	\$0	\$500,000	\$0	\$500,000
Tech. Modernization	Data Security	4710	\$144,000	\$0	\$0	\$144,000
Tech. Modernization	Data Security	4710	\$0	\$144,000	\$0	\$144,000
Tech. Modernization	Virtual Desktop - DaaS	4727	\$350,000	\$500,000	\$0	\$850,000
Tech. Modernization	FY19 Data Centre Projects	4716	\$100,000	\$0	\$0	\$100,000
Tech. Modernization	FY20 Data Centre Projects	4719	\$0	\$200,000	\$200,000	\$400,000
Tech. Modernization	1327 Interfaces - 523 FTS, 340 RDX, 245 MQSI, 253 JCAPS, 44 PM4D, 7 VB	4706	\$62,500	\$62,500	\$0	\$125,000
Tech. Modernization	SCI connections	4495	\$100,000	\$100,000	\$0	\$200,000
Tech. Modernization	INVP4605 - IS Sourcing Renewal	4605	(\$1,500,000)	(\$2,500,000)	(\$2,500,000)	(\$6,500,000)
Tech. Modernization	Legacy Migration of Web Access Portal User to VZ RSA Service		\$50,000	\$50,000		\$100,000
Cyber 1	Identity and Access Management Phase 2		\$267,121	\$267,121	\$267,121	\$801,363
Cyber 1	Identity and Access Management Phase 3		\$168,448	\$168,448	\$168,448	\$505,344
Cyber 1	CNI Network Security		\$513,622	\$513,622	\$513,622	\$1,540,866
Cyber 1	End user initiated secure file & email transfer		\$25,043	\$25,043	\$25,043	\$75,129
Cyber 1	Enterprise Network Security		\$2,196,191	\$2,196,191	\$2,196,191	\$6,588,573
Cyber 1	US Cyber Security Operations Center		\$133,415	\$133,415	\$133,415	\$400,245
Cyber 1	Security Information & Event Management - Phase 2		\$131,253	\$131,253	\$131,253	\$393,759
Cyber 2	Cyber Security 2 Delivery		\$1,897,000	\$3,017,000	\$4,137,000	\$9,051,000
Total RTB			\$16,454,833	\$19,236,033	\$17,251,133	\$52,941,999

Testimony of the Information Services Panel

Exhibit __ (ISP-8)

IS operating expenses for the Historic Test Year, Rate Year and Data Years

Niagara Mohawk Power Corporation d/b/a National Grid
Total Information Services
Incremental Operating Expenses (\$Millions)

	CY16 (HTY)	FY19 (Rate Year)	FY20	FY21
Operational Cost				
Commercial Management	21.2	25.9	26.5	27.4
Cyber Security	8.3	12.8	13.2	13.6
Physical Security	13.7	15.3	15.8	16.2
Apps Maintenance	13.5	20.8	21.4	22.0
CNI Ops	33.2	34.4	35.2	36.4
Data Centers	29.4	28.9	29.8	30.7
Verizon	35.3	36.3	37.4	38.5
Email & Xerox	7.6	6.7	6.9	7.1
Enterprise Service Delivery	16.9	20.8	21.5	22.1
Administration	27.0	28.7	29.6	30.6
Subtotal Operational Cost	\$206.1	\$230.6	\$237.2	\$244.6
Investment Plan				
IS Base (1) (2)	11.8	42.7	46.0	27.7
Investment Plan	\$11.8	\$42.7	\$46.0	\$27.7
CTA (IS Transformation)	\$15.5	\$0.0	\$0.0	\$0.0
Total IS Opex	\$233.4	\$273.3	\$283.2	\$272.3
Total Incremental IS Opex Costs from CY16	N/A	\$39.9	\$49.8	\$38.9
HTY	\$233.4			
Inflation		4.95%	2.72%	2.40%
Inflation on HTY Labor & Ops	\$11.6		\$6.7	\$6.0
Total HTY Spend with Inflation (already embedded in RR)	\$245.0		\$279.9	\$289.2
RY forecasted Spend		\$273.3	\$283.2	\$272.3
Increase after Inflation		\$28.3	\$3.2	(\$16.9)
G012 Allocator - NMPC Electric share	23.87%	\$6.76	\$0.77	(\$4.04)
G012 Allocator - NMPC Gas Share	4.58%	\$1.30	\$0.15	(\$0.78)

(1) CY16 excludes CRIS write-off \$19.2M

(2) Excludes Gas Business Enablement (GBE) and NY REV/grid modernization

Gas Enablement (GBE)	-	64.0	41.0	21.0
NY REV/grid modernization	-	20.0	22.8	22.3