Date of Request: July 21, 2017 Request No. DPS-654 AT-8
Due Date: July 31, 2017 NMPC Req. No. NM-1318

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Information Systems Panel

SUBJECT: **PROJECT COST ESTIMATES**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact.

For the Gas Business Enablement (GBE) program, provide the following:

1. All supporting information used to estimate the capital costs shown in Exhibit__(ISP-3). Include in your response the total cost estimate provided by Accenture, and the breakdown between capital costs and operations costs. Fully describe the cost estimation process and include any assumptions, calculations, etc., and specify the source(s) used. If the costs are not shown by project, provide a reconciliation to the total GBE capital costs shown in Exhibit__(ISP-3). Explain how each project contributes to achieving a specific program benefit(s) listed in Exhibit__(GIOP-9).

2. All supporting information for the proposed in-service dates shown on Exhibit__(ISP-3). Describe why the proposed in-service date is appropriate and achievable.

3. All contracts and invoices for GBE projects that were not included in the response to DPS-276.

Response:

1. Attachment 1 includes workpapers supporting the calculations and detailing the assumptions and sources of capital costs included in Exhibit __ (ISP-3) and the operating costs included in Exhibit __ (GIOP-10).

   As explained in the Company's response to DPS-431(a) and (b), cost estimates for the GBE Program were developed by Accenture, in its role as strategic assessment (design) partner utilizing its proprietary estimating model. Costs were developed utilizing a bottoms-up approach for each initiative that included (i) the labor effort required (as determined by Accenture from its actual experience with prior technology and platform implementations of a similar size and scope); (ii) software and hardware costs (utilizing the latest vendor quoted prices where available or Accenture's experience), and (iii) labor rates, which were derived from National Grid's internal labor rates and, where internal rates were not applicable, current external market labor rates were used. As part of the development of cost estimates, Accenture validated and sized the estimates by comparing them to their actual experience with other programs of similar size and scope.

   The "Understanding the Model" tab of Attachment 1 explains the calculation of the GBE cost estimates and the various tabs included in Attachment 1. The "Summary" table includes a breakdown of the capital and operating costs of GBE by initiative. The "Assumptions" tab includes the data and information required to calculate the labor rates reflected in the majority of the initiatives. The assumptions and cost estimation process for software and hardware costs are provided in the "Hardware & Software Support" tab. Finally, the assumptions behind certain contractor support costs not reflected under the "Assumptions" tab are included in the "Contractor Support tab."

   Each project included in Exhibit __ (ISP-3) with an in-service date in the Rate or Data Years has a corresponding description with capabilities and benefits detailed in Exhibit __ (GIOP-9). Attachment 2 maps where each project included in Exhibit __ (ISP-3) can be located in Exhibit __ (GIOP-9) for a discussion of capabilities and benefits. Please note the capabilities and benefits of three projects in Exhibit __ (ISP-3) were not included in Exhibit __ (GIOP-9) because they are in-service after Data Year 2. Nonetheless, Attachment 2 includes a description of the capabilities and benefits of the three projects.

2. Please see Attachment 1to EDF-1 for the GBE Program Roadmap that provides graphical representation of the in-service dates referenced in Exhibit __ (ISP-3).

   The GBE Program Roadmap is phased and prioritized over five years based on three criteria:
   1. Reducing operational risk to the business;
   2. Ensuring GBE can be delivered successfully; and
   3. Demonstrating early value creation where possible.

   The approach avoids a "big bang" implementation by breaking down the GBE Program based on the initiatives and associated work types. Further, the GBE Program roadmap

deploys initiatives by geography and prioritizes work types to accelerate delivery and manage risks. A strict stage-gate methodology will be employed to manage delivery and implementation across National Grid's geographies, once pre-defined thresholds of performance have been successfully demonstrated.

The initiatives and their rollout plans were developed during the GBE Program's Strategic Assessment Phase of design and planning in close collaboration with National Grid's partner, Accenture. Accenture leveraged extensive transformational program design and implementation knowledge from its utility practice to design a program that aligned to the objectives and prioritization criteria above. The National Grid GBE team, comprised of experienced leaders from all areas of the business, including Field Operations (Maintenance and Construction), Customer Meter Services, Dispatch, Asset Management, Call Center, Supply Chain, Procurement, Human Resources, and Information Services groups collaborated with support from business subject matter experts on the development of the Roadmap. Additionally, PwC was contracted as the Design Assurance partner during the Strategic Assessment Phase to review and validate the completeness and deliverability of the GBE Roadmap.

With any large transformational program, there are a number of elements that need to be considered when designing the initiatives, planning program implementation, and establishing in-service dates. First, there are foundational elements required to stand-up the GBE solutions. These are initiatives that establish the underlying framework to support new applications, systems, and the necessary infrastructure required to deliver the Program, and include (descriptions of capabilities and benefits in Exhibit __ (GIOP-5, page 5).

- Powerplan Architecture Enhancements (November 2017)
- Comprehensive Integration Service (Enhancement) (December 2017)
- Application (Environment) Infrastructure Upgrades (December 2017)

Second, there are core applications that drive the GBE Program around which everything else is built. The GBE core solutions are:

- Enterprise Asset Management (EAM) serving as the work management solution for construction, maintenance, and inspection activities as well as the asset repository (*i.e.* system of record) for the Company's assets (October 2018);
- Scheduling solution integrating work management and field mobile applications for the purpose of improving visibility to the work and resources supporting the field activities (October 2018);
- Field Mobile solution enabling our employees with digital handheld field devices with real-time access to data to facilitate and support construction, maintenance and inspection activities and allow for electronic data capture (October 2018); and
- Geospatial Information System (GIS) creating the visual representation of the planned and unplanned activities to allow improvements in gas safety and compliance through improved asset management, capital planning and execution of field activities (March 2019).

Third, are the supporting initiatives to improve existing data and establish methods for continuous improvement of key asset and operational data as well as IS enabling efforts to establish an environment to support deployment of the new systems and provide for continuous improvement of the systems. Also in this group are the efforts to design and deploy new materials and methods to conduct field technical training to meet the challenges of the changing regulatory environment and ensuring that field employees are competent and qualified. These activities are aligned with the delivery and support of the core solutions deployments.

Finally, there are enhancing initiatives to create the right environment for change management and business readiness to adopt the new ways of working. Capabilities will also be deployed as part of these enhancing initiatives and, in many cases, built upon the core platforms to deliver a step change in the Company's business performance and interact with and enable the Company's customers. Examples of these initiatives are provided below and described in detail in Exhibit __ (GIOP-9).

- CxT Portal & Channel Management (June 2019)
- Employee Support Interaction (Release 1 – October 2019, Release 2 - July 2020)
- Customer Interaction (Release 1 – October 2019, Release 2 - January 2021)
- Customer Relationship Management (CRM) / Contact Center (June 2020)
- Large Commercial & Landlord Interaction (July 2020)
- PowerPlan Integration & Enhancements (June 2020)
- Asset Investment Planning and Management ("AIPM") Tool – Enhancements (December 2018)
- Additional Integrity Management ("IM") Modules (February 2019)
- Design (GWD), Estimating (CU), & Mobility (September 2020)
- Asset Analytics Integration (December 2020)
- GIS (GWD/CU) – Project Portfolio Management ("PPM") Integration (December 2020)

3. No contracts have been finalized with respect to the capital or operating costs of the GBE initiatives included in the Company's Rate or Data Years. However, pursuant to discussions with DPS Staff, the Company is providing contracts (Attachments 3-6) and invoices (Attachments 7-10) related to the Strategic Assessment work in 2016-FY17.

Attachments 1 and 3-8 contain Confidential Information. The Company has prepared confidential and redacted versions of Attachments 6-8 which have been submitted to DPS trial staff and the appropriate parties per the Protective Order. Because of how the confidential information is distributed, Attachments 1 and 3-5 are being provided only in confidential form. The Company will prepare a Request for Protected Status in accordance with the terms of the Ruling Adopting Protective Order.

Name of Respondent:
Johnny Johnston

Date of Reply:
July 31, 2017

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

Investment Name	Programs	In Service Date	Exhibit __ (GIOP-9) Reference
Planned Projects			
Risk Management (Tx Mains & Dx Mains)	GBE- Asset Management	12/1/17	Exhibit __ (GIOP-9), Page 2
AM Program Leadership-1	GBE- Asset Management	3/1/18	Exhibit __ (GIOP-9), Page 14
Enhancements	GBE- Asset Management	12/1/18	Exhibit __ (GIOP-9), Page 5
Additional IM Modules	GBE- Asset Management	2/1/19	Exhibit __ (GIOP-9), Page 5
AM Program Leadership-2	GBE- Asset Management	3/1/19	Exhibit __ (GIOP-9), Page 14
Data Remediation, GIS Upgrade/ Migration & GIS Mobility	GBE- Asset Management	3/1/19	Exhibit __ (GIOP-9), Page 5
EAM-FIN Integration	GBE- Asset Management	6/1/19	Exhibit __ (GIOP-9), Page 7
Integrity Management Integrations	GBE- Asset Management	10/1/19	Exhibit __ (GIOP-9), Page 8
AM Program Leadership-3	GBE- Asset Management	3/1/20	Exhibit __ (GIOP-9), Page 14
Design (GWD), Estimating (CU), & Mobility	GBE- Asset Management	9/1/20	Exhibit __ (GIOP-9), Page 10
Asset Analytics Integration	GBE- Asset Management	12/1/20	Exhibit __ (GIOP-9), Page 11
GIS (GWD/CU) - PPM Integration	GBE- Asset Management	12/1/20	Exhibit __ (GIOP-9), Page 11
GIS-EAM Integration	GBE- Asset Management	12/2/20	Exhibit __ (GIOP-9), Page 12
AM Program Leadership-4	GBE- Asset Management	3/1/21	Exhibit __ (GIOP-9), Page 14
Use Case No.1 - Asset Risk	GBE- Asset Management	3/1/21	Exhibit __ (GIOP-9), Page 13
Complex Design (CAD) & Estimating (ESW)	GBE- Asset Management	3/1/21	Exhibit __ (GIOP-9), Page 13
Program Learning Management-1	GBE- Business Enablement	3/1/18	Exhibit __ (GIOP-9), Page 14
Program Transformational Change Office-1	GBE- Business Enablement	3/1/18	Exhibit __ (GIOP-9), Page 15
Program Business Sustainment-1	GBE- Business Enablement	3/1/19	Exhibit __ (GIOP-9), Page 15
Program Learning Management-2	GBE- Business Enablement	3/1/19	Exhibit __ (GIOP-9), Page 15
Program Transformational Change Office -2	GBE- Business Enablement	3/1/19	Exhibit __ (GIOP-9), Page 15
Program Learning Management-3	GBE- Business Enablement	3/1/20	Exhibit __ (GIOP-9), Page 15
Program Transformational Change Office-3	GBE- Business Enablement	3/1/20	Exhibit __ (GIOP-9), Page 15
Program Business Sustainment-2	GBE- Business Enablement	3/1/21	Exhibit __ (GIOP-9), Page 15
Program Learning Management-4	GBE- Business Enablement	3/1/21	Exhibit __ (GIOP-9), Page 15
Program Transformational Change Office-4	GBE- Business Enablement	3/1/21	Exhibit __ (GIOP-9), Page 15
Customer Experience Program Leadership-1	GBE- Customer Engagement	3/1/19	Exhibit __ (GIOP-9), Page 17
CxT Portal & Channel Management	GBE- Customer Engagement	6/1/19	Exhibit __ (GIOP-9), Page 7
Customer Interaction - First Release	GBE- Customer Engagement	10/1/19	Exhibit __ (GIOP-9), Page 9
Employee Support Interaction - First Release	GBE- Customer Engagement	10/1/19	Exhibit __ (GIOP-9), Page 9
Customer Experience Program Leadership-2	GBE- Customer Engagement	3/1/20	Exhibit __ (GIOP-9), Page 17
CRM / Contact Center	GBE- Customer Engagement	6/1/20	Exhibit __ (GIOP-9), Page 10
Large Commercial & Landlord Interaction	GBE- Customer Engagement	7/1/20	Exhibit __ (GIOP-9), Page 10
Employee Support Interaction - Second Release	GBE- Customer Engagement	7/1/20	Exhibit __ (GIOP-9), Page 9
Customer Interaction - Second Release	GBE- Customer Engagement	1/1/21	Exhibit __ (GIOP-9), Page 9
Customer Experience Program Leadership-3	GBE- Customer Engagement	3/1/21	Exhibit __ (GIOP-9), Page 17
Data Management Implementation (Quality & Cleansing	GBE- Data Management	12/1/17	Exhibit __ (GIOP-9), Page 2
Data Management & Governance Program Leadership-1	GBE- Data Management	3/1/18	Exhibit __ (GIOP-9), Page 15
Enable the Data Archive Process	GBE- Data Management	3/1/19	Exhibit __ (GIOP-9), Page 6
Data Management & Governance Program Leadership-2	GBE- Data Management	3/1/19	Exhibit __ (GIOP-9), Page 15
Data Management & Governance Program Leadership-3	GBE- Data Management	3/1/20	Exhibit __ (GIOP-9), Page 15
Powerplan Remediation	GBE- Information Services Enabling	11/1/17	Exhibit __ (GIOP-9), Page 1
Comprehensive Integration Services (Enhancements)	GBE- Information Services Enabling	12/1/17	Exhibit __ (GIOP-9), Page 1
Application (Environment) Infrastructure	GBE- Information Services Enabling	12/1/17	Exhibit __ (GIOP-9), Page 1
Development Operations & BPA Enablement-1	GBE- Information Services Enabling	3/1/18	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-1	GBE- Information Services Enabling	3/1/18	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-1	GBE- Information Services Enabling	3/1/18	Exhibit __ (GIOP-9), Page 15
Operations/System Monitoring	GBE- Information Services Enabling	8/1/18	Exhibit __ (GIOP-9), Page 4
Development Operations & BPA Enablement-2	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-2	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 2-1	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-2	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 15
Development Operations & BPA Enablement-3	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-3	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 2-2	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 3-1	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-3	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 15
Test Automation Implementation	GBE- Information Services Enabling	12/1/20	Exhibit __ (GIOP-9), Page 12
Development Operations & BPA Enablement-4	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-4	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 3-2	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-4	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 15
Portfolio Management Leadership-1	GBE- Portfolio Office	3/1/18	Exhibit __ (GIOP-9), Page 16
Solution Architects & Agile Coaches-1	GBE- Portfolio Office	3/1/18	Exhibit __ (GIOP-9), Page 16
Portfolio Management Leadership-2	GBE- Portfolio Office	3/1/19	Exhibit __ (GIOP-9), Page 16
Solution Architects & Agile Coaches-2	GBE- Portfolio Office	3/1/19	Exhibit __ (GIOP-9), Page 16
Portfolio Management Leadership-3	GBE- Portfolio Office	3/1/20	Exhibit __ (GIOP-9), Page 16
Solution Architects & Agile Coaches-3	GBE- Portfolio Office	3/1/20	Exhibit __ (GIOP-9), Page 16
Portfolio Management Leadership-4	GBE- Portfolio Office	3/1/21	Exhibit __ (GIOP-9), Page 16

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

Investment Name	Programs	In Service Date	Exhibit __ (GIOP-9) Reference
Regulatory/ Compliance	GBE- Regulatory and Compliance	9/1/19	Exhibit __ (GIOP-9), Page 7
Supply Chain Program Leadership	GBE- Supply Chain	3/1/19	Exhibit __ (GIOP-9), Page 14
Supply Chain Program Leadership	GBE- Supply Chain	3/1/20	Exhibit __ (GIOP-9), Page 14
Business Architecture Design	GBE- Work Management	12/1/17	Exhibit __ (GIOP-9), Page 3
WMFE Program Leadership-1	GBE- Work Management	3/1/18	Exhibit __ (GIOP-9), Page 16
Corrosion and I&R Work	GBE- Work Management	7/1/18	Exhibit __ (GIOP-9), Page 4
CU Governance & Library - process	GBE- Work Management	11/1/18	Exhibit __ (GIOP-9), Page 4
WMFE Program Leadership-2	GBE- Work Management	3/1/19	Exhibit __ (GIOP-9), Page 16
Company Driven Work: Collections and non-Appointment Offs - Ga	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
Company Driven Work: Collections and non-Appointment Offs- Electri	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
Customer, Leak Investigation & Inspections - Gas	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
Customer, Leak Investigation & Inspections - Electric	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
WMFE Program Leadership-3	GBE- Work Management	3/1/20	Exhibit __ (GIOP-9), Page 16
PowerPlan Integration & Enhancements	GBE- Work Management	6/1/20	Exhibit __ (GIOP-9), Page 10
Construction Work & Leak Repair	GBE- Work Management	9/1/20	Exhibit __ (GIOP-9), Page 11
WMFE Program Leadership-4	GBE- Work Management	3/1/21	Exhibit __ (GIOP-9), Page 16
Work Forecasting & Planning - solution	GBE- Work Management	5/1/21	In-Service After DY2 (Note 1)
Core Projects & Program Management	GBE- Work Management	6/1/21	In-Service After DY2 (Note 2)
WMFE Optimization	GBE- Work Management	3/1/22	In-Service After DY2 (Note 3)

Note 1: The Work Forecasting & Planning - solution implements single, enterprise work forecasting & planning platform with the following capabilities:
*Implements integration with Project Management, EAM, and HR (People/User) systems
*Provides one view of work and resources (internal and contract resources)
*Designs and deploys business and decision-making processes, governance, and policies including divisional nuances to support continuous improvement
*Ability to forecast through a statistical analysis of historical data, adjusted to future factors that may impact predicted volumes (e.g. weather, marketing campaigns, billing events etc.)
*Ability to optimize forecast of work to resources to meet target milestones
*Provides training on process and technology enhancements

Note 2: Core Projects & Program Management implements a Project Management platform specifically focused on scheduled/long cycle work (projects/programs) with the following capabilities:
• Planning & Scheduling
• Resource Management & Capacity Planning
• Earned Value Management
• Risk & Issue Management
• Project collaboration (design review, meeting minutes, action items)
• Funding / budgeting / forecasting
• Management of Change
• Permit management
• Emergent work tracking
• Commissioning
• Develops A81 standard work procedures, KPI's, metrics, and targets
• Develops templates and forms as necessary
• Defines processes to be automated and the design of workflows or methods to automate
• Conversion of project data
• Develops detailed implementation and training plans for end users

Note 3: WMFE Optimization implements additional capabilities of Enterprise Asset Management ("EAM") and Field Mobility along with integration to the Project Management system.
• Enhances EAM capabilities which include auto work notifications, link project info in Project Management system to work orders, job plans and PMs in EAM
• Enhances Supervisor field mobile with additional capabilities, which include view and track crew/work orders progress spatially and send notification to crews
• Implements additional field mobile capabilities including mobile red lining, GIS mobile mapping (i.e., integrated with Work Management app)
• Includes training on process and technology enhancements

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

08/29/2016

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100171809
Purchase Order Number: 3200256137

Customer ID: 10003018

Attention: Kenneth Healy (Ref. PO# 3200256137)
AcctsPayableAdmini@nationalgrid.com

	Tax Rate		
Line# 1 Fixed Fee Milestone Based Payments MS1 - Mobilization and Kickoff (Commencement of project)	0%	USD	[redacted]
Total Amount		USD	[redacted]

Please remit by payment due date: 09/28/2016

Invoice Reference: 1100171809
Federal Tax Identification Number: 720542904
Amount: US Dollar [redacted]

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 1100171809

Accounts Payable 09-28-16 11:10:41 Received

nationalgrid
the power of action.

NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000024824

To: ACCENTURE LP
161 N CLARK ST
CHICAGO, IL 60601

PURCHASE ORDER

Purchase Order No: 3200289970 **PO Date:** 02/10/2017

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-Gabby Prescot 4th floor
52 Second Ave
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Amendment # 5 Strategic Assessment for Customer Experience, Mobility and Enterprise Work and Asset Management Executed January 30, 2016 Fixed Price Engagement Labor Cost Not to Exceed [redacted] Expenses Not to Exceed [redacted] Cumulative PO Value Not to Exceed [redacted] The Supplier Point of Contact and Accenture Engagement Manager will be Sandra Jones Per National Grid Corporate Policy Background Checks Are Required							

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200289970

PO Date: 02/10/2017

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
1		Fixed Consultant Fees **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	02/07/2017
2		Expenses **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	02/07/2017
						Net Total:	[redacted]	**USD**

PO continued on the next page

Page 2 of 3

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PURCHASE ORDER

Purchase Order No: 3200289970 **PO Date:** 02/10/2017

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Procure to Pay Contact Center (SDC) at 1-888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

We are an environmentally friendly company, please use email whenever possible.

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

03/28/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

PRO FORMA INVOICE 9993165648
Purchase Order Number: 3200286045

Customer ID: 10003018

	Tax Rate		
Interim IS Consultancy March Consulting Fees	0%	USD	[redacted]
Total Amount		USD	[redacted]

Please remit by payment due date: 05/12/2017

Invoice Reference: 9993165648
Amount: US Dollar [redacted]

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 9993165648

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

03/28/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

PRO FORMA INVOICE 9993165647
Purchase Order Number: 3200286045

Customer ID: 10003018

	Tax Rate		
Interim IS Consultancy February Consulting Fees	0%	USD	[redacted]
Total Amount		USD	[redacted]

Please remit by payment due date: 05/12/2017

Invoice Reference: 9993165647
Amount: US Dollar [redacted]

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 9993165647

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

03/30/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100247737
Purchase Order Number: 3200286045

Customer ID: 10003018

January Expenses

	Tax Rate		
Interim IS Consultancy February	0%	USD	74,987.76
Consulting Expenses			

Total Amount	USD	74,987.76

Airfares - Business Travel $29,050.33
Car Rental $7,605.50
Hotel $23,576.01
Taxi/Ground Tranportation/Parking/Tolls $5,843.43
Telecomm/Miscellaneous $810.49
PerDiem and Meals $8,102.00

Please remit by payment due date: 05/14/2017

Invoice Reference: 1100247737
Amount: US Dollar 74,987.76

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 1100247737

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

03/28/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100247664
Purchase Order Number: 3200286045

Customer ID: 10003018

February Expenses
Airfares - Business Travel: $27,789.95
Car Rental: $8,303.26
Hotel:$29,190.07
Taxi/Ground Tranportation/Parking/Tolls:$6,493.12
Telecomm (Misc):$2,140.51
PerDiem and Meals:$7,933.00

	Tax Rate		
Interim IS Consultancy February Consulting Expenses	0%	USD	81,849.91
Total Amount		USD	81,849.91

Please remit by payment due date: 05/12/2017

Invoice Reference: 1100247664
Amount: US Dollar 81,849.91

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 1100247664

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NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000024824

To: ACCENTURE LP
161 N CLARK ST
CHICAGO, IL 60601

PURCHASE ORDER

Purchase Order No: 3200286045 **PO Date:** 01/23/2017

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-G.Prescott 4th floor
52 Second Ave
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Amendment #4 to the Work Pack for Strategic Assessment for Customer Experience, Mobility and Enterprise Work and Asset Management Interim Phase Activities Time and Materials Project Fees [redacted] Expenses [redacted] Cumulative PO Value Not To Exceed [redacted]						

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200286045 **PO Date:** 01/23/2017

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
1		Estimated fees for Amendment 4 SOW includes Amendments. Additional scope of Services aligns to GBS in order to enable mobilization for Phase 2 **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	01/20/2017
2		capped expenses SOW includes Amendments. Additional scope of Services aligns to GBS in order to enable mobilization for Phase 2 **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	01/20/2017
						Net Total:	[redacted]	**USD**

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200286045 **PO Date:** 01/23/2017

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Service Delivery Center Response Team (SDC) at 888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

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NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000024824

To: ACCENTURE LP
161 N CLARK ST
CHICAGO, IL 60601

PURCHASE ORDER

Purchase Order No: 3200281035 **PO Date:** 12/27/2016

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-Gabby Prescott 52 2nd Ave 4th, Waltham
40 Sylvan Rd
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

*** Terms of Payment:** 30 Days Net

*** Terms of Delivery:** Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		This Amendment Number Three (“Amendment”) to the Work Pack (or Statement of Work) for the procurement of Strategic Assessment for Customer Experience, Mobility and Enterprise Work and Asset Management. Time and Materials Engagement Nichole Faulkner Software Selection RFP Lead Valerie Provost Software Selection Support PO Value Not To Exceed [redacted]						
1		Software Selection RFP Support **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	12/20/2016

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200281035

PO Date: 12/27/2016

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
2		Expenses **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	12/20/2016
						Net Total:	[redacted]	**USD**

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200281035 **PO Date:** 12/27/2016

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Procure to Pay Contact Center (SDC) at 1-888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

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NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000024824

To: ACCENTURE LP
161 N CLARK ST
CHICAGO, IL 60601

PURCHASE ORDER

Purchase Order No: 3200277288 **PO Date:** 12/06/2016

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-Gabby Prescott (52 2nd Ave, 4th floor)
40 Sylvan Rd
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Supply Chain Work Stream as indicated in the following: This Amendment Number Two (“Amendment”) to the Work Pack (or Statement of Work) for the procurement of Strategic Assessment for Customer Experience, Mobility and Enterprise Work and Asset Management(executed August 1,2016) underthe FRAMEWORK FORTS CONSULTANCY SERVICES AGREEMENT between National Grid USA Service Company, Inc. d/bla National Grid (“COMPANY”) and Accenture LLP (“CONTRACTOR”) dated February 9, 2016 (“Agreement”) is made and entered into as of the 31 day of October, 2016 (“Amendment Two Effective Date”) This work is associated with the original PO 3200256137 for Strategic Partner.						
1		Consultant Services **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	From 12/05/2016

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200277288

PO Date: 12/06/2016

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
2		Consultant Expenses **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	From 12/05/2016
							Net Total: [redacted]	**USD**

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200277288 **PO Date:** 12/06/2016

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Procure to Pay Contact Center (SDC) at 1-888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

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NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000024824

To: ACCENTURE, LP
161 N CLARK ST
CHICAGO, IL 60601

PURCHASE ORDER

Purchase Order No: 3200256137 **PO Date:** 08/08/2016

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-Waltham Corporate Office-Gas Enablement
52 Second Ave
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		This STATEMENT OF WORK is for the procurement of Strategic Assessment for Customer Experience, Mobility and Enterprise Work and Asset Management under the Framework for IS Consultancy Services Agreement dated February 9, 2016 between Accenture LLP (“Contractor”) and National Grid USA Service Company, Inc. This is Fixed Price PO Vvalue is not to exceed [redacted]						
1		Fixed Fee Milestone based payments **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	08/03/2016
2		Performance Assessment Award Payment** **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	08/03/2016

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200256137

PO Date: 08/08/2016

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
3		Travel and Expenses Capped **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	08/03/2016
							Net Total: [redacted]	**USD**

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200256137 **PO Date:** 08/08/2016

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Service Delivery Center Response Team (SDC) at 888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NG USA Service Company	041466315-00
NG USA Service Company	41
NG USA Service Company	DP 3828
NG USA Service Company	800037
NG Corporate Services LLC	800036
NG Corporate Services LLC	DP 3809
Niagara Mohawk Power Corp	DP 000006
Brooklyn Union Gas	DP 000201
Keyspan Corp	DP 3471
Keyspan Corp	R00011
Massachusetts Electric Co	800039
Nantucket Electric Co	800040
Boston Gas Company	800035
Essex Gas Company	800033
Colonial Gas Company	800034
Narragansett Electric Co	050187805-00
New England Power Company	041663070-00

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200256137 **PO Date:** 08/08/2016

New England Power Company	800038
National Grid Generation LLC	DP 3920

End of the Purchase Order **Page 4 of 4**

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Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

08/29/2016

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

PRO FORMA INVOICE 9992890309
Purchase Order Number: 3200256137

Customer ID: 10003018

Attention: Kenneth Healy (Ref. PO# 3200256137)
AcctsPayableAdmini@nationalgrid.com

	Tax Rate		
Line# 1 Fixed Fee Milestone Based Payments MS1 - Mobilization and Kickoff (Commencement of project)	0%	USD	[redacted]
Total Amount		USD	[redacted]

Please remit by payment due date: 09/28/2016

Invoice Reference: 9992890309
Amount: US Dollar [redacted]

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 9992890309

Accounts Payable 08-29-16 11:13:11 Received

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

03/22/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100245379
Purchase Order Number: 3200256137

Customer ID: 10003018

Confirmation Number

	Tax Rate		
Performance Assessment Award	0%	USD	[redacted]
Total Amount		USD	[redacted]

Please remit by payment due date: 05/06/2017

Invoice Reference: 1100245379
Amount: US Dollar [redacted]

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 1100245379

accenture

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

01/27/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100225923

Customer ID: 10003018

3200256137

	Tax Rate		
National Grid GBE Software EAM RFP Support December Expenses	0%	USD	11,433.22
Total Amount		USD	11,433.22

Please remit by payment due date: 03/13/2017

Invoice Reference: 1100225923
Amount: US Dollar 11,433.22

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 1100225923

Accounts Payable 02-13-17 13:24:26 Received

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

01/27/2017

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100225919

Customer ID: 10003018

PO # 3200256137

	Tax Rate		
National Grid GBE Strategic Assessment December Expenses	0%	USD	69,507.44
Total Amount		USD	69,507.44

Please remit by payment due date: 03/13/2017

Invoice Reference: 1100225919
Amount: US Dollar 69,507.44

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number: [redacted]
Qualifier: Invoice 1100225919

Accounts Payable 02-13-17 13:23:57 Received

Row Labels	Sum of Amount	
Atura, Angela	$	4,442.87
Badiani, Hemal	$	2,479.21
Bolino, Gregory	$	4,243.08
Chiodi, David R	$	17.00
Del Santo, Edward J.	$	5,568.34
Dobrosky III, Lawrence	$	4,074.60
Durdov, Eric	$	1,336.66
Houchins, Granville C.	$	4,418.94
Johnson, Benjamin	$	3,822.61
Jones, Sandra	$	8,418.30
Kenney, Jamison	$	3,792.89
Levy, Michael	$	2,968.96
Lewis, Jeffrey	$	501.85
Mumtaz, Ayesha	$	3,432.26
Peters, Craig S.	$	5,225.10
Smoyer, Scott	$	6,222.72
Suss, Courtney	$	2,677.28
Wong, Munyee	$	3,041.10
Yeung, Monica	$	2,823.67
Grand Total	**$**	**69,507.44**

Name	Detail
Atura, Angela	120816TollFee
Atura, Angela	Service Fee EWR EWR-28/11/2016 0167926414953
Atura, Angela	Service Fee BOS -08/12/2016 0167928007159
Atura, Angela	Service Fee EWR -05/12/2016 0167927802668
Atura, Angela	Service Fee EWR EWR-12/12/2016 0167929374137
Atura, Angela	103116TollFee
Atura, Angela	121216TollFee
Atura, Angela	110716TollFee
Atura, Angela	111416TollFee
Atura, Angela	120116Home<->Airport/train
Atura, Angela	120516Home<->Airport/train
Atura, Angela	121216Home<->Airport/train
Atura, Angela	121516Home<->Airport/train
Atura, Angela	BOS -08/12/2016 0167928007159
Atura, Angela	121216TollFee
Atura, Angela	EWR -05/12/2016 0167927802668
Atura, Angela	112816Hotel-48.00-4
Atura, Angela	120516Hotel-48.00-4
Atura, Angela	121216Hotel-48.00-4
Atura, Angela	121216ClientSite<->Airport/train
Atura, Angela	112816ClientSite<->Airport/train
Atura, Angela	120516ClientSite<->Airport/train
Atura, Angela	EWR EWR-12/12/2016 0167929374137
Atura, Angela	121216Other-4
Atura, Angela	112816Other-4
Atura, Angela	120516Other-4
Badiani, Hemal	HemalBadiani9802545692
Badiani, Hemal	Service Fee CLT CLT-28/11/2016 0017926632905
Badiani, Hemal	Service Fee CLT CLT-05/12/2016 0017928333103
Badiani, Hemal	112816Home<->Airport/train
Badiani, Hemal	120116Home<->Airport/train
Badiani, Hemal	120516Home<->Airport/train
Badiani, Hemal	120816Home<->Airport/train
Badiani, Hemal	Hemal Badiani 980-254-5692
Badiani, Hemal	120516Hotel-48.00-3
Badiani, Hemal	120516ClientSite<->Airport/train
Badiani, Hemal	112816Hotel-48.00-4
Badiani, Hemal	112816ClientSite<->Airport/train
Badiani, Hemal	CLT CLT-05/12/2016 0017928333103
Badiani, Hemal	120516Aloft-3
Badiani, Hemal	112816Aloft-4
Bolino, Gregory	120716Other-Uber
Bolino, Gregory	November - Hotel - 8x48
Bolino, Gregory	December - Hotel - 4x48
Bolino, Gregory	Service Fee PHX BOS-07/12/2016 0067928062251
Bolino, Gregory	Service Fee BOS -09/12/2016 0067928062268

Bolino, Gregory	Service Fee DTW DTW-11/12/2016 0067928574114
Bolino, Gregory	121416TollFee
Bolino, Gregory	121316TollFee
Bolino, Gregory	122516TollFee
Bolino, Gregory	120716Parking
Bolino, Gregory	120716Parking
Bolino, Gregory	121816Parking
Bolino, Gregory	111316Westin-2
Bolino, Gregory	121916Westin-2
Bolino, Gregory	BOS -09/12/2016 0067928062268
Bolino, Gregory	PHX BOS-07/12/2016 0067928062251
Bolino, Gregory	121216Rccf-0067928574114-Bos-Dtw
Bolino, Gregory	DTW DTW-11/12/2016 0067928574114
Bolino, Gregory	121216ClientSite<->ClientSite
Bolino, Gregory	112716Aloft-5
Bolino, Gregory	121116Westin-6
Chiodi, David R	Service Fee CVGDTWCVG-27/11/2016 0067926113292
Del Santo, Edward J.	Edward J.Del Santo5089820649
Del Santo, Edward J.	120716TollFee
Del Santo, Edward J.	112816TollFee
Del Santo, Edward J.	122516TollFee
Del Santo, Edward J.	121116Internet
Del Santo, Edward J.	112716Internet
Del Santo, Edward J.	120916Internet
Del Santo, Edward J.	Edward J.Del Santo5089820649
Del Santo, Edward J.	Service Fee DEN -11/12/2016 0167928333149
Del Santo, Edward J.	121516TollFee
Del Santo, Edward J.	121216TollFee
Del Santo, Edward J.	112716TollFee
Del Santo, Edward J.	122116TollFee
Del Santo, Edward J.	121116Home<->Airport/train
Del Santo, Edward J.	121616Hotel-48.00-1
Del Santo, Edward J.	120116Hotel-48.00-1
Del Santo, Edward J.	Edward J. Del Santo 508-982-0649
Del Santo, Edward J.	121916Hotel-48.00-2
Del Santo, Edward J.	121916Aloft-2
Del Santo, Edward J.	121516Marriott-2
Del Santo, Edward J.	120216SubscriptionToOptimorouteForAnalysis
Del Santo, Edward J.	BOS -09/12/2016 0167929248929
Del Santo, Edward J.	120516Hotel-48.00-5
Del Santo, Edward J.	121116Hotel-48.00-5
Del Santo, Edward J.	112816ClientSite<->Airport/train
Del Santo, Edward J.	10125744 -TravelPrepaid
Del Santo, Edward J.	120516ClientSite<->Airport/train
Del Santo, Edward J.	DEN -11/12/2016 0167928333149
Del Santo, Edward J.	121216ClientSite<->Airport/train
Del Santo, Edward J.	121116Aloft-5

Del Santo, Edward J.	112716Aloft-6
Del Santo, Edward J.	120516Aloft-6
Dobrosky III, Lawrence	120316TollFee
Dobrosky III, Lawrence	112816Hotel<->ClientSite
Dobrosky III, Lawrence	120516Home<->Airport/train
Dobrosky III, Lawrence	Service Fee BOS -08/12/2016 0017927181672
Dobrosky III, Lawrence	Service Fee LAX -11/12/2016 0017929034554
Dobrosky III, Lawrence	Service Fee BOS -15/12/2016 0017929034657
Dobrosky III, Lawrence	121116Home<->Airport/train
Dobrosky III, Lawrence	120116Home<->Airport/train
Dobrosky III, Lawrence	120816Hotel<->Airport
Dobrosky III, Lawrence	121516ClientSite<->Airport/train
Dobrosky III, Lawrence	121116Hotel<->Airport
Dobrosky III, Lawrence	120116Hotel-48.00-1
Dobrosky III, Lawrence	121816Internet
Dobrosky III, Lawrence	120516ClientSite<->Airport/train
Dobrosky III, Lawrence	11117072 -TravelPrepaid
Dobrosky III, Lawrence	11117072 -TravelPrepaid
Dobrosky III, Lawrence	BOS -08/12/2016 0017927181672
Dobrosky III, Lawrence	LAX -11/12/2016 0017929034554
Dobrosky III, Lawrence	120516Hotel-48.00-4
Dobrosky III, Lawrence	121116Hotel-48.00-5
Dobrosky III, Lawrence	BOS -15/12/2016 0017929034657
Dobrosky III, Lawrence	120516Aloft-4
Dobrosky III, Lawrence	112716Other-5
Dobrosky III, Lawrence	121116Other-5
Durdov, Eric	EricDurdov3124807777
Durdov, Eric	Service Fee BOS -01/12/2016 0017927078224
Durdov, Eric	Service Fee ORD -27/11/2016 0017926113443
Durdov, Eric	Service Fee ORD -05/12/2016 0167927802696
Durdov, Eric	113016Hotel<->ClientSite
Durdov, Eric	Eric Durdov 312-480-7777
Durdov, Eric	120116Hotel-48.00-1
Durdov, Eric	120116Home<->Airport/train
Durdov, Eric	BOS -01/12/2016 0017927078224
Durdov, Eric	ORD -05/12/2016 0167927802696
Durdov, Eric	112816Aloft-4
Houchins, Granville C.	Granville C.Houchins7274527569
Houchins, Granville C.	Granville C.Houchins7274527569
Houchins, Granville C.	121216SoftwareSupport
Houchins, Granville C.	121416TollFee
Houchins, Granville C.	121416TollFee
Houchins, Granville C.	122116TollFee
Houchins, Granville C.	121616TollFee
Houchins, Granville C.	121416TollFee
Houchins, Granville C.	121316TollFee
Houchins, Granville C.	120116Hotel-48.00-1

Houchins, Granville C.	Granville C. Houchins 727-452-7569
Houchins, Granville C.	121516Parking
Houchins, Granville C.	120116Parking
Houchins, Granville C.	120516Parking
Houchins, Granville C.	112716Afbl
Houchins, Granville C.	121216Hotel-48.00-4
Houchins, Granville C.	120516Hotel-48.00-4
Houchins, Granville C.	120516ClientSite<->Airport/train
Houchins, Granville C.	121216ClientSite<->Airport/train
Houchins, Granville C.	112816ClientSite<->Airport/train
Houchins, Granville C.	10011427 -TravelPrepaid
Houchins, Granville C.	10011427 -TravelPrepaid
Houchins, Granville C.	121216Marriott-4
Houchins, Granville C.	112816Marriott-4
Houchins, Granville C.	120516Marriott-4
Johnson, Benjamin	121216Fuel
Johnson, Benjamin	121216Fuel
Johnson, Benjamin	Service Fee MSP MSP-12/12/2016 0067927802728
Johnson, Benjamin	Service Fee MSP MSP-05/12/2016 0067927886024
Johnson, Benjamin	112016TollFee
Johnson, Benjamin	103116TollFee
Johnson, Benjamin	121516Home<->Airport/train
Johnson, Benjamin	121216Home<->Airport/train
Johnson, Benjamin	120816Home<->Airport/train
Johnson, Benjamin	120516Home<->Airport/train
Johnson, Benjamin	120516Hotel-48.00-4
Johnson, Benjamin	121216Hotel-48.00-4
Johnson, Benjamin	121216ClientSite<->Airport/train
Johnson, Benjamin	120516ClientSite<->Airport/train
Johnson, Benjamin	121216Westin-4
Johnson, Benjamin	120516Westin-4
Johnson, Benjamin	MSP MSP-12/12/2016 0067927802728
Johnson, Benjamin	MSP MSP-05/12/2016 0067927886024
Jones, Sandra	122516TollFee
Jones, Sandra	November - Hotel - 21x48
Jones, Sandra	December - Hotel - 11x48
Jones, Sandra	122216Home<->Airport/train
Jones, Sandra	121016Home<->Airport/train
Jones, Sandra	Service Fee DCA DCA-19/12/2016 0017931287644
Jones, Sandra	Service Fee DCA DCA-03/01/2017 0017931905922
Jones, Sandra	Service Fee DCA DCA-05/12/2016 0017928062291
Jones, Sandra	Service Fee BOS -08/12/2016 0017929185088
Jones, Sandra	122416TollFee
Jones, Sandra	Service Fee BOS -15/12/2016 2797931145575
Jones, Sandra	121916Parking
Jones, Sandra	120116Home<->Airport/train
Jones, Sandra	Service Fee BOS -30/11/2016 0017926670641

Jones, Sandra	Service Fee BOS -01/12/2016 0017927389989
Jones, Sandra	121516Parking
Jones, Sandra	122116Home<->Airport/train
Jones, Sandra	120916Home<->Airport/train
Jones, Sandra	121916Home<->Airport/train
Jones, Sandra	120516Home<->ClientSite
Jones, Sandra	122116Aloft-1
Jones, Sandra	121916ClientSite<->Airport/train
Jones, Sandra	112816Aloft-5
Jones, Sandra	BOS -30/11/2016 0017926670641
Jones, Sandra	BOS -01/12/2016 0017927389989
Jones, Sandra	BOS -08/12/2016 0017929185088
Jones, Sandra	112816ClientSite<->Airport/train
Jones, Sandra	DCA DCA-05/12/2016 0017928062291
Jones, Sandra	BOS -15/12/2016 2797931145575
Jones, Sandra	DCA DCA-12/12/2016 0017929211964
Jones, Sandra	DCA DCA-03/01/2017 0017931905922
Jones, Sandra	DCA DCA-12/12/2016 0017930218780
Jones, Sandra	120516ClientSite<->Airport/train
Jones, Sandra	121216ClientSite<->Airport/train
Jones, Sandra	120116Aloft-1
Jones, Sandra	DCA DCA-19/12/2016 0017931287644
Jones, Sandra	121216Aloft-4
Jones, Sandra	120516Aloft-5
Kenney, Jamison	112116TollFee
Kenney, Jamison	120516TollFee
Kenney, Jamison	122516TollFee
Kenney, Jamison	120216Rccf-0010641566709-Sce-Bos
Kenney, Jamison	Service Fee PHL PHL-28/11/2016 2797926261199
Kenney, Jamison	Service Fee PHL PHL-05/12/2016 2797928062341
Kenney, Jamison	121516Afbl
Kenney, Jamison	120516Afbl
Kenney, Jamison	121516TollFee
Kenney, Jamison	112716Rccf-2790617852979-Phl-Bos
Kenney, Jamison	112516TollFee
Kenney, Jamison	122116TollFee
Kenney, Jamison	121516Home<->Airport/train
Kenney, Jamison	120116Home<->Airport/train
Kenney, Jamison	120516Home<->Airport/train
Kenney, Jamison	120116Hotel-48.00-1
Kenney, Jamison	120516Hotel-48.00-4
Kenney, Jamison	121216Hotel-48.00-4
Kenney, Jamison	121116Home<->ClientSite
Kenney, Jamison	112816Home<->ClientSite
Kenney, Jamison	120516Home<->ClientSite
Kenney, Jamison	120216Flexibletripreimbursement-0012103179677-
Kenney, Jamison	PHL PHL-05/12/2016 2797928062341

Kenney, Jamison	112816Aloft-5
Kenney, Jamison	121216Aloft-5
Kenney, Jamison	120516Aloft-5
Levy, Michael	122816TollFee
Levy, Michael	Service Fee ATL ATL-12/12/2016 0067926848417
Levy, Michael	121216Home<->Airport/train-0.54-42
Levy, Michael	121616TollFee
Levy, Michael	122716TollFee
Levy, Michael	121616Hotel-48.00-1
Levy, Michael	120116Hotel-48.00-1
Levy, Michael	120116Parking
Levy, Michael	121516LeMeridien-2
Levy, Michael	121316Parking
Levy, Michael	121316Hotel-48.00-3
Levy, Michael	BOS -16/12/2016 0067931004706
Levy, Michael	112816ClientSite<->Airport/train
Levy, Michael	121316ClientSite<->Airport/train
Levy, Michael	ATL ATL-12/12/2016 0067926848417
Levy, Michael	ATL ATL-13/12/2016 0067929635355
Levy, Michael	121316Aloft-3
Levy, Michael	112816Aloft-4
Lewis, Jeffrey	111616Marriott-3
Mumtaz, Ayesha	121416TollFee
Mumtaz, Ayesha	121716Internet
Mumtaz, Ayesha	121516Hotel<->Office
Mumtaz, Ayesha	Service Fee ORD -28/11/2016 0167926487327
Mumtaz, Ayesha	Service Fee BOS -01/12/2016 0017926713217
Mumtaz, Ayesha	Service Fee BOS -15/12/2016 0017930387994
Mumtaz, Ayesha	Service Fee ORD -12/12/2016 0017929907641
Mumtaz, Ayesha	Service Fee ORD ORD-05/12/2016 0017927726906
Mumtaz, Ayesha	121516Afbl
Mumtaz, Ayesha	121216Home<->Airport/train
Mumtaz, Ayesha	120516Home<->Airport/train
Mumtaz, Ayesha	112816Home<->Airport/train
Mumtaz, Ayesha	120816Home<->Airport/train
Mumtaz, Ayesha	120116Home<->Airport/train
Mumtaz, Ayesha	121516LaptopPrivacyScreenToProtectClientData
Mumtaz, Ayesha	121516ClientSite<->Airport/train
Mumtaz, Ayesha	121216ClientSite<->Airport/train
Mumtaz, Ayesha	BOS -15/12/2016 0017930387994
Mumtaz, Ayesha	BOS -01/12/2016 0017926713217
Mumtaz, Ayesha	121216Hotel-48.00-4
Mumtaz, Ayesha	120516Hotel-48.00-4
Mumtaz, Ayesha	ORD -12/12/2016 0017929907641
Mumtaz, Ayesha	ORD ORD-05/12/2016 0017927726906
Mumtaz, Ayesha	120516Other-4
Mumtaz, Ayesha	121216Other-4

Mumtaz, Ayesha	112816Other-4
Peters, Craig S.	122516TollFee
Peters, Craig S.	121516Internet
Peters, Craig S.	121516TollFee
Peters, Craig S.	Service Fee DTW DTW-05/12/2016 0067927802636
Peters, Craig S.	Service Fee DTW DTW-12/12/2016 0067927802675
Peters, Craig S.	121416TollFee
Peters, Craig S.	121416TollFee
Peters, Craig S.	121416TollFee
Peters, Craig S.	121716Parking
Peters, Craig S.	122416TollFee
Peters, Craig S.	121416TollFee
Peters, Craig S.	120116Hotel-48.00-1
Peters, Craig S.	120816Internet
Peters, Craig S.	120516Parking
Peters, Craig S.	120516Hotel-48.00-4
Peters, Craig S.	121216Hotel-48.00-4
Peters, Craig S.	121216ClientSite<->Airport/train
Peters, Craig S.	120516ClientSite<->Airport/train
Peters, Craig S.	120516ClientSite<->Airport/train
Peters, Craig S.	112816ClientSite<->Airport/train
Peters, Craig S.	DTW DTW-12/12/2016 0067927802675
Peters, Craig S.	DTW DTW-05/12/2016 0067927802636
Peters, Craig S.	112816CourtyardByMarriott-4
Peters, Craig S.	120516CourtyardByMarriott-4
Peters, Craig S.	121216CourtyardByMarriott-4
Peters, Craig S.	121216CourtyardByMarriott-4
Smoyer, Scott	121616Home<->Airport/train
Smoyer, Scott	112216Home<->Airport/train
Smoyer, Scott	121216Home<->Airport/train
Smoyer, Scott	120616Home<->Airport/train
Smoyer, Scott	112816Home<->Airport/train
Smoyer, Scott	120116Home<->Airport/train
Smoyer, Scott	120816Home<->Airport/train
Smoyer, Scott	120616ClientSite<->ClientSite
Smoyer, Scott	120616Hotel-48.00-3
Smoyer, Scott	DFW DFW-06/12/2016 0017926713157
Smoyer, Scott	120716MobilePhone
Smoyer, Scott	121216ClientSite<->ClientSite
Smoyer, Scott	112816Hotel-48.00-4
Smoyer, Scott	121216Hotel-48.00-4
Smoyer, Scott	112816ClientSite<->ClientSite
Smoyer, Scott	111416ClientSite<->ClientSite
Smoyer, Scott	120616Sheraton-3
Smoyer, Scott	10728003 -TravelPrepaid
Smoyer, Scott	10728003 -TravelPrepaid
Smoyer, Scott	111416Hotel-48.00-9

Smoyer, Scott	121216Sheraton-4
Smoyer, Scott	112816Sheraton-4
Smoyer, Scott	111416Sheraton-9
Suss, Courtney	120516Home<->Airport/train
Suss, Courtney	120116Home<->Airport/train
Suss, Courtney	Service Fee BOS -08/12/2016 0017928452088
Suss, Courtney	120816Home<->Airport/train
Suss, Courtney	121316Home<->Airport/train
Suss, Courtney	112816Home<->Airport/train
Suss, Courtney	120216TollFee
Suss, Courtney	120916TollFee
Suss, Courtney	BOS -08/12/2016 0017928452088
Suss, Courtney	112816Hotel-48.00-4
Suss, Courtney	120516Hotel-48.00-4
Suss, Courtney	112816ClientSite<->Airport/train
Suss, Courtney	120516ClientSite<->Airport/train
Suss, Courtney	120116Flexibletripreimbursement-0017927340479-
Suss, Courtney	112816Aloft-4
Suss, Courtney	120516AcHoteles-4
Wong, Munyee	Service Fee EWR EWR-05/12/2016 0167928007157
Wong, Munyee	Service Fee EWR EWR-12/12/2016 0167928616631
Wong, Munyee	120816Home<->Airport/train
Wong, Munyee	121516Home<->Airport/train
Wong, Munyee	112816Home<->Airport/train
Wong, Munyee	120116Home<->Airport/train
Wong, Munyee	120516Home<->Airport/train
Wong, Munyee	112816Hotel-48.00-4
Wong, Munyee	120516Hotel-48.00-4
Wong, Munyee	121216Hotel-48.00-4
Wong, Munyee	EWR EWR-05/12/2016 0167928007157
Wong, Munyee	EWR EWR-12/12/2016 0167928616631
Wong, Munyee	112816Other-4
Wong, Munyee	120516Other-4
Wong, Munyee	121216Other-4
Yeung, Monica	121916Internet
Yeung, Monica	120616TollFee
Yeung, Monica	112916Internet
Yeung, Monica	120616TollFee
Yeung, Monica	Service Fee BOS -20/12/2016 0067930546862
Yeung, Monica	Service Fee LGA -06/12/2016 0067928757305
Yeung, Monica	Service Fee ORD -19/12/2016 0167930546846
Yeung, Monica	Service Fee ORD -12/12/2016 0167929746720
Yeung, Monica	121216TollFee
Yeung, Monica	102516TollFee
Yeung, Monica	101216TollFee
Yeung, Monica	122016ClientSite<->Airport/train
Yeung, Monica	Service Fee BOS -08/12/2016 0167928794762

Yeung, Monica	092816TollFee
Yeung, Monica	121916Hotel-48.00-1
Yeung, Monica	121916Home<->Airport/train
Yeung, Monica	120916Home<->Airport/train
Yeung, Monica	121216Hotel-48.00-2
Yeung, Monica	120716Hotel-48.00-2
Yeung, Monica	121116ClientSite<->Office
Yeung, Monica	120616ClientSite<->Airport/train
Yeung, Monica	ORD -19/12/2016 0167930546846
Yeung, Monica	LGA -06/12/2016 0067928757305
Yeung, Monica	121916Sheraton-2
Yeung, Monica	BOS -20/12/2016 0067930546862
Yeung, Monica	BOS -08/12/2016 0167928794762
Yeung, Monica	120616Other-3
Yeung, Monica	ORD -12/12/2016 0167929746720

Category	Posting date	Amount	USD
Travel - Ground (Expenses)	2016-12-01	5.60	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	20.95	USD
Travel - Ground (Expenses)	2016-12-01	22.40	USD
Travel - Ground (Expenses)	2016-12-01	22.45	USD
Travel - Ground (Expenses)	2016-12-01	31.95	USD
Travel - Ground (Expenses)	2016-12-01	80.00	USD
Travel - Ground (Expenses)	2016-12-01	80.00	USD
Travel - Ground (Expenses)	2016-12-01	80.00	USD
Travel - Ground (Expenses)	2016-12-01	80.00	USD
Travel - Air (Expenses)	2016-12-01	98.38	USD
Travel - Ground (Expenses)	2016-12-01	130.00	USD
Travel - Air (Expenses)	2016-12-01	163.58	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	212.16	USD
Travel - Ground (Expenses)	2016-12-01	225.09	USD
Travel - Ground (Expenses)	2016-12-01	225.52	USD
Travel - Air (Expenses)	2016-12-01	429.77	USD
Accommodation (Expenses)	2016-12-01	557.34	USD
Accommodation (Expenses)	2016-12-01	666.84	USD
Accommodation (Expenses)	2016-12-01	666.84	USD
Other Miscellaneous (Expenses)	2016-12-01	12.98	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	70.00	USD
Travel - Ground (Expenses)	2016-12-01	70.00	USD
Travel - Ground (Expenses)	2016-12-01	70.00	USD
Travel - Ground (Expenses)	2016-12-01	70.00	USD
Other Miscellaneous (Expenses)	2016-12-01	77.42	USD
Meals & Per Diems (Expenses)	2016-12-01	144.00	USD
Travel - Ground (Expenses)	2016-12-01	167.18	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	250.36	USD
Travel - Air (Expenses)	2016-12-01	377.42	USD
Accommodation (Expenses)	2016-12-01	377.54	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Travel - Ground (Expenses)	2016-12-01	12.26	USD
Meals & Per Diems (Expenses)	2016-12-01	384.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD

Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	18.10	USD
Travel - Ground (Expenses)	2016-12-01	19.90	USD
Travel - Ground (Expenses)	2016-12-01	24.35	USD
Travel - Ground (Expenses)	2016-12-01	32.50	USD
Travel - Ground (Expenses)	2016-12-01	32.50	USD
Travel - Ground (Expenses)	2016-12-01	35.00	USD
Accommodation (Expenses)	2016-12-01	65.82	USD
Accommodation (Expenses)	2016-12-01	115.45	USD
Travel - Air (Expenses)	2016-12-01	226.60	USD
Travel - Air (Expenses)	2016-12-01	247.02	USD
Travel - Air (Expenses)	2016-12-01	284.03	USD
Travel - Air (Expenses)	2016-12-01	301.62	USD
Travel - Ground (Expenses)	2016-12-01	342.55	USD
Accommodation (Expenses)	2016-12-01	850.04	USD
Accommodation (Expenses)	2016-12-01	1,008.34	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Other Miscellaneous (Expenses)	2016-12-01	1.79	USD
Travel - Ground (Expenses)	2016-12-01	4.40	USD
Travel - Ground (Expenses)	2016-12-01	4.40	USD
Travel - Ground (Expenses)	2016-12-01	5.60	USD
Other Miscellaneous (Expenses)	2016-12-01	9.99	USD
Other Miscellaneous (Expenses)	2016-12-01	9.99	USD
Other Miscellaneous (Expenses)	2016-12-01	9.99	USD
Other Miscellaneous (Expenses)	2016-12-01	12.98	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	27.90	USD
Travel - Ground (Expenses)	2016-12-01	28.25	USD
Travel - Ground (Expenses)	2016-12-01	29.15	USD
Travel - Ground (Expenses)	2016-12-01	30.35	USD
Travel - Ground (Expenses)	2016-12-01	37.88	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Other Miscellaneous (Expenses)	2016-12-01	69.49	USD
Meals & Per Diems (Expenses)	2016-12-01	96.00	USD
Accommodation (Expenses)	2016-12-01	103.49	USD
Accommodation (Expenses)	2016-12-01	163.08	USD
Other Miscellaneous (Expenses)	2016-12-01	190.00	USD
Travel - Air (Expenses)	2016-12-01	200.00	USD
Meals & Per Diems (Expenses)	2016-12-01	240.00	USD
Meals & Per Diems (Expenses)	2016-12-01	240.00	USD
Travel - Ground (Expenses)	2016-12-01	262.15	USD
Travel - Air (Expenses)	2016-12-01	299.36	USD
Travel - Ground (Expenses)	2016-12-01	316.53	USD
Travel - Air (Expenses)	2016-12-01	350.06	USD
Travel - Ground (Expenses)	2016-12-01	350.81	USD
Accommodation (Expenses)	2016-12-01	589.76	USD

Accommodation (Expenses)	2016-12-01	657.68	USD
Accommodation (Expenses)	2016-12-01	1,114.26	USD
Travel - Ground (Expenses)	2016-12-01	4.40	USD
Travel - Ground (Expenses)	2016-12-01	13.39	USD
Travel - Ground (Expenses)	2016-12-01	15.96	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	17.24	USD
Travel - Ground (Expenses)	2016-12-01	30.00	USD
Travel - Ground (Expenses)	2016-12-01	33.42	USD
Travel - Ground (Expenses)	2016-12-01	43.64	USD
Travel - Ground (Expenses)	2016-12-01	44.71	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Other Miscellaneous (Expenses)	2016-12-01	49.95	USD
Travel - Ground (Expenses)	2016-12-01	88.20	USD
Travel - Air (Expenses)	2016-12-01	184.60	USD
Travel - Air (Expenses)	2016-12-01	188.10	USD
Travel - Air (Expenses)	2016-12-01	190.73	USD
Travel - Air (Expenses)	2016-12-01	190.73	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	240.00	USD
Travel - Air (Expenses)	2016-12-01	248.34	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Accommodation (Expenses)	2016-12-01	755.08	USD
Accommodation (Expenses)	2016-12-01	878.80	USD
Other Miscellaneous (Expenses)	2016-12-01	12.98	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	21.00	USD
Other Miscellaneous (Expenses)	2016-12-01	44.39	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Travel - Ground (Expenses)	2016-12-01	52.00	USD
Travel - Air (Expenses)	2016-12-01	129.43	USD
Travel - Air (Expenses)	2016-12-01	222.78	USD
Accommodation (Expenses)	2016-12-01	755.08	USD
Other Miscellaneous (Expenses)	2016-12-01	1.79	USD
Other Miscellaneous (Expenses)	2016-12-01	12.98	USD
121216SoftwareSupport	2016-12-01	14.99	USD
Travel - Ground (Expenses)	2016-12-01	17.05	USD
Travel - Ground (Expenses)	2016-12-01	20.65	USD
Travel - Ground (Expenses)	2016-12-01	21.40	USD
Travel - Ground (Expenses)	2016-12-01	24.20	USD
Travel - Ground (Expenses)	2016-12-01	24.60	USD
Travel - Ground (Expenses)	2016-12-01	27.00	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD

Other Miscellaneous (Expenses)	2016-12-01	64.00	USD
Travel - Ground (Expenses)	2016-12-01	72.00	USD
Travel - Ground (Expenses)	2016-12-01	72.00	USD
Travel - Ground (Expenses)	2016-12-01	72.00	USD
Travel - Air (Expenses)	2016-12-01	110.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	207.22	USD
Travel - Ground (Expenses)	2016-12-01	212.16	USD
Travel - Ground (Expenses)	2016-12-01	222.82	USD
Travel - Air (Expenses)	2016-12-01	338.93	USD
Travel - Air (Expenses)	2016-12-01	470.70	USD
Accommodation (Expenses)	2016-12-01	660.15	USD
Accommodation (Expenses)	2016-12-01	660.15	USD
Accommodation (Expenses)	2016-12-01	660.15	USD
Travel - Ground (Expenses)	2016-12-01	8.04	USD
Travel - Ground (Expenses)	2016-12-01	14.55	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	17.25	USD
Travel - Ground (Expenses)	2016-12-01	28.60	USD
Travel - Ground (Expenses)	2016-12-01	45.00	USD
Travel - Ground (Expenses)	2016-12-01	45.00	USD
Travel - Ground (Expenses)	2016-12-01	45.00	USD
Travel - Ground (Expenses)	2016-12-01	45.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	234.79	USD
Travel - Ground (Expenses)	2016-12-01	250.30	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
c	2016-12-01	700.26	USD
Travel - Air (Expenses)	2016-12-01	838.20	USD
Travel - Ground (Expenses)	2016-12-01	5.60	USD
Meals & Per Diems (Expenses)	2016-12-01	1,008.00	USD
Meals & Per Diems (Expenses)	2016-12-01	528.00	USD
Travel - Ground (Expenses)	2016-12-01	9.72	USD
Travel - Ground (Expenses)	2016-12-01	13.13	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	22.30	USD
Travel - Air (Expenses)	2016-12-01	35.00	USD
Travel - Ground (Expenses)	2016-12-01	42.00	USD
Travel - Ground (Expenses)	2016-12-01	57.12	USD
Travel - Air (Expenses)	2016-12-01	74.00	USD

Travel - Air (Expenses)	2016-12-01	74.00	USD
Travel - Ground (Expenses)	2016-12-01	100.00	USD
Travel - Ground (Expenses)	2016-12-01	101.31	USD
Travel - Ground (Expenses)	2016-12-01	104.97	USD
Travel - Ground (Expenses)	2016-12-01	111.09	USD
Travel - Ground (Expenses)	2016-12-01	115.35	USD
Accommodation (Expenses)	2016-12-01	188.77	USD
Travel - Ground (Expenses)	2016-12-01	192.30	USD
Accommodation (Expenses)	2016-12-01	195.77	USD
Travel - Air (Expenses)	2016-12-01	231.65	USD
Travel - Air (Expenses)	2016-12-01	231.65	USD
Travel - Air (Expenses)	2016-12-01	231.65	USD
Travel - Ground (Expenses)	2016-12-01	282.32	USD
Travel - Air (Expenses)	2016-12-01	296.10	USD
Travel - Air (Expenses)	2016-12-01	316.79	USD
Travel - Air (Expenses)	2016-12-01	330.91	USD
Travel - Air (Expenses)	2016-12-01	340.70	USD
Travel - Air (Expenses)	2016-12-01	354.25	USD
Travel - Ground (Expenses)	2016-12-01	365.77	USD
Travel - Ground (Expenses)	2016-12-01	380.61	USD
Accommodation (Expenses)	2016-12-01	391.04	USD
Travel - Air (Expenses)	2016-12-01	432.80	USD
Accommodation (Expenses)	2016-12-01	571.31	USD
Accommodation (Expenses)	2016-12-01	614.32	USD
Travel - Ground (Expenses)	2016-12-01	1.25	USD
Travel - Ground (Expenses)	2016-12-01	4.40	USD
Travel - Ground (Expenses)	2016-12-01	5.60	USD
Travel - Air (Expenses)	2016-12-01	16.05	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	20.00	USD
Travel - Air (Expenses)	2016-12-01	20.00	USD
Travel - Ground (Expenses)	2016-12-01	24.20	USD
Travel - Air (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	26.05	USD
Travel - Ground (Expenses)	2016-12-01	27.40	USD
Travel - Ground (Expenses)	2016-12-01	29.01	USD
Travel - Ground (Expenses)	2016-12-01	30.42	USD
Travel - Ground (Expenses)	2016-12-01	33.97	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	211.64	USD
Travel - Ground (Expenses)	2016-12-01	238.86	USD
Travel - Ground (Expenses)	2016-12-01	256.50	USD
Travel - Air (Expenses)	2016-12-01	320.20	USD
Travel - Air (Expenses)	2016-12-01	391.20	USD

Accommodation (Expenses)	2016-12-01	542.40	USD
Accommodation (Expenses)	2016-12-01	551.37	USD
Accommodation (Expenses)	2016-12-01	551.37	USD
Travel - Ground (Expenses)	2016-12-01	6.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	22.68	USD
Travel - Ground (Expenses)	2016-12-01	22.85	USD
Travel - Ground (Expenses)	2016-12-01	37.75	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Travel - Ground (Expenses)	2016-12-01	64.00	USD
Accommodation (Expenses)	2016-12-01	109.19	USD
Travel - Ground (Expenses)	2016-12-01	140.00	USD
Meals & Per Diems (Expenses)	2016-12-01	144.00	USD
Travel - Air (Expenses)	2016-12-01	189.65	USD
Travel - Ground (Expenses)	2016-12-01	204.77	USD
Travel - Ground (Expenses)	2016-12-01	247.60	USD
Travel - Air (Expenses)	2016-12-01	361.46	USD
Travel - Air (Expenses)	2016-12-01	362.16	USD
Accommodation (Expenses)	2016-12-01	377.54	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Accommodation (Expenses)	2016-12-01	501.85	USD
Travel - Ground (Expenses)	2016-12-01	1.25	USD
Other Miscellaneous (Expenses)	2016-12-01	9.95	USD
Travel - Ground (Expenses)	2016-12-01	12.52	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	36.00	USD
Travel - Ground (Expenses)	2016-12-01	36.00	USD
Travel - Ground (Expenses)	2016-12-01	36.00	USD
Travel - Ground (Expenses)	2016-12-01	36.00	USD
Travel - Ground (Expenses)	2016-12-01	36.00	USD
Other Miscellaneous (Expenses)	2016-12-01	36.33	USD
Travel - Ground (Expenses)	2016-12-01	46.04	USD
Travel - Ground (Expenses)	2016-12-01	48.59	USD
Travel - Air (Expenses)	2016-12-01	123.10	USD
Travel - Air (Expenses)	2016-12-01	165.70	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Air (Expenses)	2016-12-01	260.45	USD
Travel - Air (Expenses)	2016-12-01	350.90	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Accommodation (Expenses)	2016-12-01	566.31	USD

Accommodation (Expenses)	2016-12-01	570.81	USD
Travel - Ground (Expenses)	2016-12-01	4.60	USD
Other Miscellaneous (Expenses)	2016-12-01	4.95	USD
Travel - Ground (Expenses)	2016-12-01	6.50	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	17.45	USD
Travel - Ground (Expenses)	2016-12-01	21.40	USD
Travel - Ground (Expenses)	2016-12-01	25.50	USD
Travel - Ground (Expenses)	2016-12-01	26.25	USD
Travel - Ground (Expenses)	2016-12-01	28.80	USD
Travel - Ground (Expenses)	2016-12-01	30.95	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Other Miscellaneous (Expenses)	2016-12-01	51.94	USD
Travel - Ground (Expenses)	2016-12-01	92.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	207.17	USD
Travel - Ground (Expenses)	2016-12-01	215.63	USD
Travel - Ground (Expenses)	2016-12-01	215.63	USD
Travel - Ground (Expenses)	2016-12-01	215.65	USD
Travel - Air (Expenses)	2016-12-01	453.20	USD
Travel - Air (Expenses)	2016-12-01	500.85	USD
Accommodation (Expenses)	2016-12-01	660.15	USD
Accommodation (Expenses)	2016-12-01	660.15	USD
Accommodation (Expenses)	2016-12-01	660.15	USD
Accommodation (Expenses)	2016-12-01	660.18	USD
Travel - Ground (Expenses)	2016-12-01	27.39	USD
Travel - Ground (Expenses)	2016-12-01	31.52	USD
Travel - Ground (Expenses)	2016-12-01	40.09	USD
Travel - Ground (Expenses)	2016-12-01	41.92	USD
Travel - Ground (Expenses)	2016-12-01	51.28	USD
Travel - Ground (Expenses)	2016-12-01	56.38	USD
Travel - Ground (Expenses)	2016-12-01	57.28	USD
Travel - Ground (Expenses)	2016-12-01	141.69	USD
Meals & Per Diems (Expenses)	2016-12-01	144.00	USD
Travel - Air (Expenses)	2016-12-01	149.78	USD
Other Miscellaneous (Expenses)	2016-12-01	153.76	USD
Travel - Ground (Expenses)	2016-12-01	188.75	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	234.80	USD
Travel - Ground (Expenses)	2016-12-01	331.88	USD
Accommodation (Expenses)	2016-12-01	409.54	USD
Travel - Air (Expenses)	2016-12-01	409.86	USD
Travel - Air (Expenses)	2016-12-01	425.00	USD
Meals & Per Diems (Expenses)	2016-12-01	432.00	USD

Accommodation (Expenses)	2016-12-01	614.31	USD
Accommodation (Expenses)	2016-12-01	618.31	USD
Accommodation (Expenses)	2016-12-01	1,279.18	USD
Travel - Ground (Expenses)	2016-12-01	15.43	USD
Travel - Ground (Expenses)	2016-12-01	15.43	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	20.00	USD
Travel - Ground (Expenses)	2016-12-01	20.00	USD
Travel - Ground (Expenses)	2016-12-01	24.91	USD
Travel - Ground (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	26.55	USD
Travel - Air (Expenses)	2016-12-01	191.72	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Ground (Expenses)	2016-12-01	200.59	USD
Travel - Ground (Expenses)	2016-12-01	228.01	USD
Travel - Air (Expenses)	2016-12-01	394.80	USD
Accommodation (Expenses)	2016-12-01	515.58	USD
Accommodation (Expenses)	2016-12-01	598.26	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	25.00	USD
Travel - Ground (Expenses)	2016-12-01	25.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Meals & Per Diems (Expenses)	2016-12-01	192.00	USD
Travel - Air (Expenses)	2016-12-01	261.96	USD
Travel - Air (Expenses)	2016-12-01	344.70	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Accommodation (Expenses)	2016-12-01	566.31	USD
Accommodation (Expenses)	2016-12-01	566.82	USD
Other Miscellaneous (Expenses)	2016-12-01	4.99	USD
Travel - Ground (Expenses)	2016-12-01	5.60	USD
Other Miscellaneous (Expenses)	2016-12-01	9.99	USD
Travel - Ground (Expenses)	2016-12-01	13.50	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Air (Expenses)	2016-12-01	17.00	USD
Travel - Ground (Expenses)	2016-12-01	17.05	USD
Travel - Ground (Expenses)	2016-12-01	21.80	USD
Travel - Ground (Expenses)	2016-12-01	21.80	USD
Travel - Ground (Expenses)	2016-12-01	31.08	USD
Travel - Air (Expenses)	2016-12-01	35.00	USD

Travel - Ground (Expenses)	2016-12-01	36.25	USD
Meals & Per Diems (Expenses)	2016-12-01	48.00	USD
Travel - Ground (Expenses)	2016-12-01	62.00	USD
Travel - Ground (Expenses)	2016-12-01	62.00	USD
Meals & Per Diems (Expenses)	2016-12-01	96.00	USD
Meals & Per Diems (Expenses)	2016-12-01	96.00	USD
Travel - Ground (Expenses)	2016-12-01	118.56	USD
Travel - Ground (Expenses)	2016-12-01	122.33	USD
Travel - Air (Expenses)	2016-12-01	135.60	USD
Travel - Air (Expenses)	2016-12-01	149.30	USD
Accommodation (Expenses)	2016-12-01	183.75	USD
Travel - Air (Expenses)	2016-12-01	200.76	USD
Travel - Air (Expenses)	2016-12-01	333.78	USD
Accommodation (Expenses)	2016-12-01	399.88	USD
Travel - Air (Expenses)	2016-12-01	550.65	USD

Accenture LLP
161 N. Clark St.
Chicago, IL 60601
USA
Tel: 312-693-0161

09/23/2016

NATIONAL GRID
40 Sylvan Road
Waltham, MA 02451
USA

INVOICE 1100180373
Purchase Order Number: 3200256137

Customer ID: 10003018

Attention: Kenneth Healy (Ref. PO# 3200256137)
AcctsPayableAdmini@nationalgrid.com

	Tax Rate		
Strategic Consulting - August Expenses	0%	USD	77,278.74
Total Amount		USD	77,278.74

Please remit by payment due date: 10/23/2016

Invoice Reference: 1100180373
Amount: US Dollar 77,278.74

Federal Tax Identification Number: 720542904

Please remit Electronic Payment with above invoice information to:
Accenture LLP
JPMorgan Chase Bank, N.A.
Account Number: [redacted]
ABA Number [redacted]
Qualifier: Invoice 1100180373

Accounts Payable 09-23-16 12:16:42 Received

Row Labels	Sum of Amount
Angela Atura	$4,262.92
Ariel Bieler	$5,339.63
Brett Hauf	$4,117.91
Craig S. Peters	$3,906.08
Daron Gunn	$523.08
Edward J. Del Santo	$4,482.50
Eric Durdov	$4,740.33
Granville C. Houchins	$7,147.29
Hemal Badiani	$4,796.74
Jamison Kenney	$4,494.30
Mona Pomraning	$5,108.09
Monica Yeung	$7,968.60
Munyee Wong	$4,933.61
Sandra Jones	$6,175.53
Scott Smoyer	$4,477.42
Valerie Provost	$4,804.71
(blank)	
Grand Total	**$77,278.74**

Name	Detail	Category
Angela Atura	080816Marriott-4	Hotel
Angela Atura	080816Home<->ClientSite-0.54-42	Mileage/Pers Car Allowance
Angela Atura	081116Home<->ClientSite-0.54-42	Mileage/Pers Car Allowance
Angela Atura	081516Home<->ClientSite-0.54-42	Mileage/Pers Car Allowance
Angela Atura	080816TollFee	Parking Costs
Angela Atura	EWR EWR-22/08/2016 0167853882865	Airfares - Business Travel
Angela Atura	Service Fee EWR EWR-22/08/2016 0167853882865	Airfares - Business Travel
Angela Atura	082216Home<->Airport	Taxi's
Angela Atura	082516Home<->Airport	Taxi's
Angela Atura	082916Home<->Airport	Taxi's
Angela Atura	082216ClientSite<->Airport	Rent/Leased Cars
Angela Atura	081516Marriott-4	Hotel
Angela Atura	082216Aloft-4	Hotel
Angela Atura	082916Other-3	Hotel
Angela Atura	082516Internet	Telecom
Angela Atura	081516TollFee	Parking Costs
Angela Atura	11270126 -TravelAccrual	Airfares - Business Travel
Angela Atura	080816Hotel-52.00-4	Per Diems
Angela Atura	081516Hotel-52.00-4	Per Diems
Angela Atura	082216Hotel-48.00-4	Per Diems
Angela Atura	082916Hotel-48.00-3	Per Diems
Ariel Bieler	080516Home<->Airport	Taxi's
Ariel Bieler	080416Home<->Office	Taxi's
Ariel Bieler	080216Home<->Office	Taxi's
Ariel Bieler	080116Aloft-5	Hotel
Ariel Bieler	072816Crdbp-0067849823434-Lga-Log	Airfares - Business Travel
Ariel Bieler	072816Crdbp-0067849823434-Bos-Log	Airfares - Business Travel
Ariel Bieler	080416Fuel	Rent/Leased Cars
Ariel Bieler	080116TollFee	Parking Costs
Ariel Bieler	080816TollFee	Parking Costs
Ariel Bieler	BOS -18/08/2016 4517853599489	Airfares - Business Travel
Ariel Bieler	Service Fee BOS -18/08/2016 4517853599489	Airfares - Business Travel
Ariel Bieler	YYZ -20/08/2016 0147853660307	Airfares - Business Travel
Ariel Bieler	Service Fee YYZ -20/08/2016 0147853660307	Airfares - Business Travel
Ariel Bieler	080116Home<->Airport	Taxi's
Ariel Bieler	080716Home<->Airport	Taxi's
Ariel Bieler	082516Home<->ClientSite	Taxi's
Ariel Bieler	082416Home<->ClientSite	Taxi's
Ariel Bieler	082216Home<->ClientSite	Taxi's
Ariel Bieler	081716Home<->ClientSite	Taxi's
Ariel Bieler	082916Home<->Airport	Taxi's
Ariel Bieler	080716ClientSite<->Airport	Rent/Leased Cars
Ariel Bieler	080716Aloft-1	Hotel
Ariel Bieler	080816Aloft-4	Hotel
Ariel Bieler	082216Marriott-2	Hotel
Ariel Bieler	081716HamptonInns-2	Hotel
Ariel Bieler	081516Marriott-3	Hotel
Ariel Bieler	080416Crdbp-0067851721361-Bos-Ind	Airfares - Business Travel
Ariel Bieler	081516Internet	Telecom
Ariel Bieler	081516Fuel	Rent/Leased Cars
Ariel Bieler	081216Fuel	Rent/Leased Cars
Ariel Bieler	10634683 -TravelAccrual	Airfares - Business Travel
Ariel Bieler	082616LaptopChargerReplacement	Telecom
Ariel Bieler	080116Hotel-48.00-4	Per Diems
Ariel Bieler	080716Hotel-48.00-5	Per Diems
Ariel Bieler	081516Hotel-48.00-5	Per Diems
Ariel Bieler	082916Hotel-48.00-3	Per Diems
Ariel Bieler	082216Hotel-48.00-2	Per Diems
Brett Hauf	080116ClientSite<->Airport	Rent/Leased Cars
Brett Hauf	080816ClientSite<->Airport	Rent/Leased Cars
Brett Hauf	080116Aloft-4	Hotel
Brett Hauf	080816Marriott-4	Hotel

Brett Hauf	080116Home<->Airport-0.54-52	Mileage/Pers Car Allowance
Brett Hauf	080416Home<->Airport-0.54-52	Mileage/Pers Car Allowance
Brett Hauf	080816Home<->Airport-0.54-52	Mileage/Pers Car Allowance
Brett Hauf	081116Home<->Airport-0.54-52	Mileage/Pers Car Allowance
Brett Hauf	080316Bvcpwa-0012385512930-Phx-Isp	Airfares - Business Travel
Brett Hauf	072916Lmrca-5262433136842-Phx-Bos	Airfares - Business Travel
Brett Hauf	072916Afsu-5260694860519-Phx-Bos	Airfares - Business Travel
Brett Hauf	072916Afsu-5260694860518-Bos-Phx	Airfares - Business Travel
Brett Hauf	080916Bvcpwa-0017852712909-Phx-Bos	Airfares - Business Travel
Brett Hauf	080916TollFee	Parking Costs
Brett Hauf	080116Hotel-48.00-4	Per Diems
Brett Hauf	080816Hotel-48.00-4	Per Diems
Craig S. Peters	080816ClientSite<->Airport	Rent/Leased Cars
Craig S. Peters	080116ClientSite<->Airport	Rent/Leased Cars
Craig S. Peters	080116Marriott-2	Hotel
Craig S. Peters	080816Marriott-4	Hotel
Craig S. Peters	080116Internet	Telecom
Craig S. Peters	080816Parking	Parking Costs
Craig S. Peters	DTW DTW-15/08/2016 0067853796033	Airfares - Business Travel
Craig S. Peters	Service Fee DTW DTW-15/08/2016 0067853796033	Airfares - Business Travel
Craig S. Peters	DTW DTW-24/08/2016 0067853796047	Airfares - Business Travel
Craig S. Peters	Service Fee DTW DTW-24/08/2016 0067853796047	Airfares - Business Travel
Craig S. Peters	DTW DTW-29/08/2016 0067853796127	Airfares - Business Travel
Craig S. Peters	Service Fee DTW DTW-29/08/2016 0067853796127	Airfares - Business Travel
Craig S. Peters	081516ClientSite<->Airport	Rent/Leased Cars
Craig S. Peters	082416ClientSite<->Airport	Rent/Leased Cars
Craig S. Peters	081516CourtyardByMarriott-2	Hotel
Craig S. Peters	082416CourtyardByMarriott-2	Hotel
Craig S. Peters	080216Internet	Telecom
Craig S. Peters	081516Parking	Parking Costs
Craig S. Peters	082416Parking	Parking Costs
Craig S. Peters	082316TollFee	Parking Costs
Craig S. Peters	081616TollFee	Parking Costs
Craig S. Peters	081016TollFee	Parking Costs
Craig S. Peters	080116Hotel-48.00-2	Per Diems
Craig S. Peters	080816Hotel-48.00-4	Per Diems
Craig S. Peters	081516Hotel-48.00-1	Per Diems
Craig S. Peters	081616Hotel-48.00-1	Per Diems
Craig S. Peters	082416Hotel-48.00-2	Per Diems
Craig S. Peters	082916Hotel-48.00-3	Per Diems
Daron Gunn	10562366 -TravelAccrual	Airfares - Business Travel
Daron Gunn	083016Hotel-41.00-2	Per Diems
Edward J. Del Santo	081516Other-AirportToHotel	Taxi's
Edward J. Del Santo	DEN -22/08/2016 0167853455596	Airfares - Business Travel
Edward J. Del Santo	Service Fee DEN -22/08/2016 0167853455596	Airfares - Business Travel
Edward J. Del Santo	BOS -01/09/2016 0167853455605	Airfares - Business Travel
Edward J. Del Santo	Service Fee BOS -01/09/2016 0167853455605	Airfares - Business Travel
Edward J. Del Santo	082516Home<->Airport	Taxi's
Edward J. Del Santo	081816Home<->Airport	Taxi's
Edward J. Del Santo	081816Other-HotelToClient	Taxi's
Edward J. Del Santo	081816ClientSite<->Airport	Taxi's
Edward J. Del Santo	081716Other-HotelToClient	Taxi's
Edward J. Del Santo	081716Other-HotelToClient	Taxi's
Edward J. Del Santo	081516ClientSite<->Airport	Taxi's
Edward J. Del Santo	081516Home<->Airport	Taxi's
Edward J. Del Santo	082916Home<->Airport	Taxi's
Edward J. Del Santo	082216Other-CarRentalInBoston	Rent/Leased Cars
Edward J. Del Santo	082116Marriott-5	Hotel
Edward J. Del Santo	081416Marriott-5	Hotel
Edward J. Del Santo	081416Bvcpwa-0167852960674-Den-Bos	Airfares - Business Travel
Edward J. Del Santo	082516Internet	Telecom
Edward J. Del Santo	082216Internet	Telecom
Edward J. Del Santo	10125744 -TravelAccrual	Airfares - Business Travel

Edward J. Del Santo	081416Hotel-48.00-2	Per Diems
Edward J. Del Santo	081616Hotel-48.00-3	Per Diems
Edward J. Del Santo	082116Hotel-48.00-5	Per Diems
Edward J. Del Santo	082916Hotel-48.00-3	Per Diems
Eric Durdov	080816Other-ClientSite-Hotel	Taxi's
Eric Durdov	080416Home<->Airport	Taxi's
Eric Durdov	080816Home<->Airport	Taxi's
Eric Durdov	081116Home<->Airport	Taxi's
Eric Durdov	081516Home<->Airport	Taxi's
Eric Durdov	080116Aloft-4	Hotel
Eric Durdov	080816Hilton-1	Hotel
Eric Durdov	080916Marriott-3	Hotel
Eric Durdov	081216GlobalEntry	Airfares - Business Travel
Eric Durdov	ORD ORD-15/08/2016 0017853836605	Airfares - Business Travel
Eric Durdov	Service Fee ORD ORD-15/08/2016 0017853836605	Airfares - Business Travel
Eric Durdov	Eric Durdov 312-480-7777	Telecom
Eric Durdov	EricDurdov3124807777	Telecom
Eric Durdov	ORD ORD-22/08/2016 0017854845900	Airfares - Business Travel
Eric Durdov	Service Fee ORD ORD-22/08/2016 0017854845900	Airfares - Business Travel
Eric Durdov	081816Home<->Airport	Taxi's
Eric Durdov	082216Home<->Airport	Taxi's
Eric Durdov	082416Other-ToDinner	Taxi's
Eric Durdov	082416Other-FromDinner	Taxi's
Eric Durdov	082516Home<->Airport	Taxi's
Eric Durdov	081516ClientSite<->Airport	Rent/Leased Cars
Eric Durdov	081516Marriott-4	Hotel
Eric Durdov	082216Aloft-4	Hotel
Eric Durdov	080116Hotel-48.00-4	Per Diems
Eric Durdov	080816Hotel-52.00-4	Per Diems
Eric Durdov	081516Hotel-52.00-1	Per Diems
Eric Durdov	081616Hotel-52.00-3	Per Diems
Eric Durdov	082216Hotel-48.00-4	Per Diems
Granville C. Houchins	081116Marriott-1	Hotel
Granville C. Houchins	081016Marriott-1	Hotel
Granville C. Houchins	080916Marriott-1	Hotel
Granville C. Houchins	080916TollFee	Parking Costs
Granville C. Houchins	TPA -21/08/2016 2797854561480	Airfares - Business Travel
Granville C. Houchins	Service Fee TPA -21/08/2016 2797854561480	Airfares - Business Travel
Granville C. Houchins	080216Bvcpwa-0017850982798-Tpa-Bos	Airfares - Business Travel
Granville C. Houchins	080216Bvcpwa-1001-Tpa-Bos	Airfares - Business Travel
Granville C. Houchins	081516Marriott-4	Hotel
Granville C. Houchins	081216Internet	Telecom
Granville C. Houchins	080416Parking	Parking Costs
Granville C. Houchins	072816Bvcpwa-0017849971952-Tpa-Bos	Airfares - Business Travel
Granville C. Houchins	072816Bvcpwa-0017849971952-Tpa-Bos	Airfares - Business Travel
Granville C. Houchins	080816Parking	Parking Costs
Granville C. Houchins	081616TollFee	Parking Costs
Granville C. Houchins	082216TollFee	Parking Costs
Granville C. Houchins	082016Afbl-2790615970654	Airfares - Business Travel
Granville C. Houchins	081816Parking	Parking Costs
Granville C. Houchins	081016Rccf-00178531831214-Tpa-Bos	Airfares - Business Travel
Granville C. Houchins	081716ClientSite<->Office	Taxi's
Granville C. Houchins	080816ClientSite<->Airport	Rent/Leased Cars
Granville C. Houchins	080116ClientSite<->Airport	Rent/Leased Cars
Granville C. Houchins	081516ClientSite<->Airport	Rent/Leased Cars
Granville C. Houchins	082116ClientSite<->Airport	Rent/Leased Cars
Granville C. Houchins	062116Westin-1	Hotel
Granville C. Houchins	080816Marriott-4	Hotel
Granville C. Houchins	080116Marriott-4	Hotel
Granville C. Houchins	082116Marriott-2	Hotel
Granville C. Houchins	081016Bvcpwa-0017853183121-Tpa-Bos	Airfares - Business Travel
Granville C. Houchins	080116Hotel-48.00-12	Per Diems
Hemal Badiani	BOS -11/08/2016 0017853455696	Airfares - Business Travel

Hemal Badiani	Service Fee BOS -11/08/2016 0017853455696	Airfares - Business Travel
Hemal Badiani	CLT CLT-15/08/2016 0017853532362	Airfares - Business Travel
Hemal Badiani	Service Fee CLT CLT-15/08/2016 0017853532362	Airfares - Business Travel
Hemal Badiani	CLT CLT-22/08/2016 0017854739951	Airfares - Business Travel
Hemal Badiani	Service Fee CLT CLT-22/08/2016 0017854739951	Airfares - Business Travel
Hemal Badiani	081516Home<->Airport	Taxi's
Hemal Badiani	081716Home<->Airport	Taxi's
Hemal Badiani	082216Home<->Airport	Taxi's
Hemal Badiani	082516Home<->Airport	Taxi's
Hemal Badiani	083016Home<->Airport	Taxi's
Hemal Badiani	081516ClientSite<->Airport	Taxi's
Hemal Badiani	081616ClientSite<->ClientSite	Taxi's
Hemal Badiani	081716ClientSite<->ClientSite	Taxi's
Hemal Badiani	082216ClientSite<->Airport	Taxi's
Hemal Badiani	082316ClientSite<->ClientSite	Taxi's
Hemal Badiani	083016ClientSite<->Airport	Taxi's
Hemal Badiani	083116ClientSite<->ClientSite	Taxi's
Hemal Badiani	081516Hilton-3	Hotel
Hemal Badiani	082216Hilton-2	Hotel
Hemal Badiani	082316Sheraton-3	Hotel
Hemal Badiani	083016Sheraton-2	Hotel
Hemal Badiani	080116TollFee	Parking Costs
Hemal Badiani	080816TollFee	Parking Costs
Hemal Badiani	10451093 -TravelAccrual	Airfares - Business Travel
Hemal Badiani	080116Hotel-48.00-4	Per Diems
Hemal Badiani	080816Hotel-48.00-4	Per Diems
Hemal Badiani	081516Hotel-41.00-3	Per Diems
Hemal Badiani	082216Hotel-52.00-4	Per Diems
Hemal Badiani	083016Hotel-41.00-2	Per Diems
Jamison Kenney	081016Marriott-2	Hotel
Jamison Kenney	081016Lmrca-0017853238656-Phl-Bos	Airfares - Business Travel
Jamison Kenney	080916Anaiobto-0017852906900-Phl-Bos	Airfares - Business Travel
Jamison Kenney	080916Anaiobto-2797852960501-Bos-Phl	Airfares - Business Travel
Jamison Kenney	PHL PHL-22/08/2016 0017854785208	Airfares - Business Travel
Jamison Kenney	Service Fee PHL PHL-22/08/2016 0017854785208	Airfares - Business Travel
Jamison Kenney	081116Other-AirportHome	Taxi's
Jamison Kenney	081016Home<->Airport	Taxi's
Jamison Kenney	081016Other-AirportToClientSite	Taxi's
Jamison Kenney	081516Home<->Airport	Taxi's
Jamison Kenney	081716Other-HotelToClientSite	Taxi's
Jamison Kenney	081816Other-HotelToClientSite	Taxi's
Jamison Kenney	081816Other-AirportToHome	Taxi's
Jamison Kenney	082216Other-AirportToHome	Taxi's
Jamison Kenney	082216Other-AirportToClientSite	Taxi's
Jamison Kenney	082516Other-AirportToHome	Taxi's
Jamison Kenney	082916Home<->Airport	Taxi's
Jamison Kenney	082916Other-AirportToClient	Taxi's
Jamison Kenney	082916Other-Food/clientSiteToHotel	Taxi's
Jamison Kenney	083016Home<->Office	Taxi's
Jamison Kenney	080916CourtyardByMarriott-1	Hotel
Jamison Kenney	080916CourtyardByMarriott-1	Hotel
Jamison Kenney	081016CourtyardByMarriott-1	Hotel
Jamison Kenney	081516Marriott-4	Hotel
Jamison Kenney	082216Marriott-4	Hotel
Jamison Kenney	11174979 -TravelAccrual	Airfares - Business Travel
Jamison Kenney	081516Hotel-48.00-4	Per Diems
Jamison Kenney	082916Hotel-48.00-3	Per Diems
Jamison Kenney	082216Hotel-48.00-4	Per Diems
Jamison Kenney	081016Hotel-48.00-2	Per Diems
Mona Pomraning	081416Home<->Airport-0.54-30	Mileage/Pers Car Allowance
Mona Pomraning	PDXEN PDX-14/08/2016 0167853836693	Airfares - Business Travel
Mona Pomraning	PDXEN PDX-21/08/2016 0167854739807	Airfares - Business Travel
Mona Pomraning	Service Fee PDXEN PDX-21/08/2016 0167854739807	Airfares - Business Travel

Mona Pomraning	PDXDENPDX-28/08/2016 0167854739881	Airfares - Business Travel
Mona Pomraning	Service Fee PDXDENPDX-28/08/2016 0167854739881	Airfares - Business Travel
Mona Pomraning	082116ClientSite<->Airport	Rent/Leased Cars
Mona Pomraning	081416ClientSite<->Airport	Rent/Leased Cars
Mona Pomraning	082116Marriott-5	Hotel
Mona Pomraning	081416Hilton-5	Hotel
Mona Pomraning	081416Home<->Airport-0.54-30	Mileage/Pers Car Allowance
Mona Pomraning	081816Home<->Airport-0.54-30	Mileage/Pers Car Allowance
Mona Pomraning	082116Home<->Airport-0.54-30	Mileage/Pers Car Allowance
Mona Pomraning	082516Home<->Airport-0.54-30	Mileage/Pers Car Allowance
Mona Pomraning	082116Internet	Telecom
Mona Pomraning	082316TollFee	Parking Costs
Mona Pomraning	081416Hotel-48.00-2	Per Diems
Mona Pomraning	082116Hotel-48.00-5	Per Diems
Mona Pomraning	082816Hotel-48.00-4	Per Diems
Monica Yeung	081216Home<->Airport	Taxi's
Monica Yeung	080816Home<->Airport	Taxi's
Monica Yeung	080516Home<->Airport	Taxi's
Monica Yeung	080816ClientSite<->Airport	Rent/Leased Cars
Monica Yeung	080116ClientSite<->Airport	Rent/Leased Cars
Monica Yeung	080116Aloft-4	Hotel
Monica Yeung	080816Aloft-4	Hotel
Monica Yeung	080316Bvcpwa-0167851350037-Ord-Bos	Airfares - Business Travel
Monica Yeung	072716Afbl	Airfares - Business Travel
Monica Yeung	072716Afbl	Airfares - Business Travel
Monica Yeung	080916TollFee	Parking Costs
Monica Yeung	BOS -01/09/2016 0167854148898	Airfares - Business Travel
Monica Yeung	LAX -05/09/2016 0067854148896	Airfares - Business Travel
Monica Yeung	Service Fee LAX -05/09/2016 0067854148896	Airfares - Business Travel
Monica Yeung	BOS -18/08/2016 0167853326029	Airfares - Business Travel
Monica Yeung	Service Fee BOS -18/08/2016 0167853326029	Airfares - Business Travel
Monica Yeung	ORD -15/08/2016 0167853326030	Airfares - Business Travel
Monica Yeung	Service Fee ORD -15/08/2016 0167853326030	Airfares - Business Travel
Monica Yeung	LGA -25/08/2016 0067856471550	Airfares - Business Travel
Monica Yeung	Service Fee LGA -25/08/2016 0067856471550	Airfares - Business Travel
Monica Yeung	ORD -29/08/2016 0067856524069	Airfares - Business Travel
Monica Yeung	Service Fee ORD -29/08/2016 0067856524069	Airfares - Business Travel
Monica Yeung	ORD -21/08/2016 0167855343133	Airfares - Business Travel
Monica Yeung	Service Fee ORD -21/08/2016 0167855343133	Airfares - Business Travel
Monica Yeung	BOS -23/08/2016 0067854907473	Airfares - Business Travel
Monica Yeung	Service Fee BOS -23/08/2016 0067854907473	Airfares - Business Travel
Monica Yeung	LGA -26/08/2016 0067854907499	Airfares - Business Travel
Monica Yeung	Service Fee LGA -26/08/2016 0067854907499	Airfares - Business Travel
Monica Yeung	082316TollFee	Parking Costs
Monica Yeung	082116TollFee	Parking Costs
Monica Yeung	082216TollFee	Parking Costs
Monica Yeung	081816Internet	Telecom
Monica Yeung	082116Internet	Telecom
Monica Yeung	082316Sheraton-3	Hotel
Monica Yeung	082116Aloft-3	Hotel
Monica Yeung	081516Aloft-4	Hotel
Monica Yeung	082116Home<->ClientSite	Rent/Leased Cars
Monica Yeung	081516ClientSite<->Airport	Rent/Leased Cars
Monica Yeung	082516Home<->Airport	Taxi's
Monica Yeung	082116ClientSite<->Airport	Taxi's
Monica Yeung	082516ClientSite<->Airport	Taxi's
Monica Yeung	081816Home<->Airport	Taxi's
Monica Yeung	082116Home<->Airport	Taxi's
Monica Yeung	080216Home<->Airport	Taxi's
Monica Yeung	10054987 -TravelAccrual	Airfares - Business Travel
Monica Yeung	080216Home<->Airport	Taxi's
Monica Yeung	080216Home<->Airport	Taxi's
Monica Yeung	080116Hotel-48.00-4	Per Diems

Monica Yeung	080816Hotel-48.00-4	Per Diems
Monica Yeung	081516Hotel-48.00-1	Per Diems
Monica Yeung	082916Hotel-52.00-1	Per Diems
Monica Yeung	083016Hotel-48.00-2	Per Diems
Monica Yeung	082416Hotel-52.00-2	Per Diems
Monica Yeung	082216Hotel-48.00-2	Per Diems
Monica Yeung	081516Hotel-48.00-4	Per Diems
Munyee Wong	080816ClientSite<->Airport	Taxi's
Munyee Wong	080116Home<->Airport	Taxi's
Munyee Wong	080416Home<->Airport	Taxi's
Munyee Wong	081116Home<->Airport	Taxi's
Munyee Wong	080816Aloft-4	Hotel
Munyee Wong	080116Aloft-4	Hotel
Munyee Wong	080816Bvcpwa-0167852085677-Ewr-Bos	Airfares - Business Travel
Munyee Wong	080116Bvcpwa-0167849868912-Ewr-Bos	Airfares - Business Travel
Munyee Wong	081516Other-HomeToTrainStation	Taxi's
Munyee Wong	081516Other-TrainStation>Hotel	Taxi's
Munyee Wong	081616Other-HotelToClientSite	Taxi's
Munyee Wong	081716Other-HotelToClientSite	Taxi's
Munyee Wong	082916Home<->Airport	Taxi's
Munyee Wong	082916Other-AirportToHotel	Taxi's
Munyee Wong	082216Marriott-2	Hotel
Munyee Wong	081516Hilton-3	Hotel
Munyee Wong	082916Marriott-3	Hotel
Munyee Wong	081516Home<->ClientSite-Metropark-Providenc	Trains
Munyee Wong	082216TollFee	Parking Costs
Munyee Wong	082316TollFee	Parking Costs
Munyee Wong	10771602 -TravelAccrual	Airfares - Business Travel
Munyee Wong	080116Hotel-48.00-4	Per Diems
Munyee Wong	080816Hotel-48.00-4	Per Diems
Munyee Wong	080116Hotel-48.00-4	Per Diems
Munyee Wong	081616Hotel-41.00-2	Per Diems
Munyee Wong	082216Hotel-52.00-2	Per Diems
Munyee Wong	083016Hotel-41.00-2	Per Diems
Sandra Jones	080816Home<->Airport	Taxi's
Sandra Jones	080416Home<->Airport	Taxi's
Sandra Jones	081216ClientSite<->ClientSite	Taxi's
Sandra Jones	081116ClientSite<->Airport	Taxi's
Sandra Jones	080116ClientSite<->Airport	Taxi's
Sandra Jones	080116ClientSite<->Airport	Taxi's
Sandra Jones	080116ClientSite<->Airport	Taxi's
Sandra Jones	080116ClientSite<->Airport	Taxi's
Sandra Jones	080816ClientSite<->Airport	Rent/Leased Cars
Sandra Jones	080516Westin-1	Hotel
Sandra Jones	080816Aloft-5	Hotel
Sandra Jones	DCA DCA-15/08/2016 0017853383688	Airfares - Business Travel
Sandra Jones	Service Fee DCA DCA-15/08/2016 0017853383688	Airfares - Business Travel
Sandra Jones	DCA DCA-06/09/2016 0017856428715	Airfares - Business Travel
Sandra Jones	Service Fee DCA DCA-06/09/2016 0017856428715	Airfares - Business Travel
Sandra Jones	082716TollFee	Parking Costs
Sandra Jones	082316TollFee	Parking Costs
Sandra Jones	081616TollFee	Parking Costs
Sandra Jones	082516Home<->Airport	Taxi's
Sandra Jones	082216Home<->Airport	Taxi's
Sandra Jones	081816Home<->Airport	Taxi's
Sandra Jones	081516Home<->Airport	Taxi's
Sandra Jones	083016Home<->Airport	Taxi's
Sandra Jones	082916Home<->Airport	Taxi's
Sandra Jones	082216Aloft-5	Hotel
Sandra Jones	081516Aloft-5	Hotel
Sandra Jones	083016Hotel-48.00-19	Per Diems
Scott Smoyer	080416Home<->Airport	Taxi's
Scott Smoyer	082216Home<->Airport	Taxi's

Scott Smoyer	082616Home<->Airport	Taxi's
Scott Smoyer	082916Home<->Airport	Taxi's
Scott Smoyer	080116Home<->Airport	Taxi's
Scott Smoyer	082216ClientSite<->ClientSite	Rent/Leased Cars
Scott Smoyer	080116Sheraton-4	Hotel
Scott Smoyer	082216Marriott-5	Hotel
Scott Smoyer	082216Lmrca-0012387314573-Dfw-Bos	Airfares - Business Travel
Scott Smoyer	080816MobilePhone	Telecom
Scott Smoyer	080416Internet	Telecom
Scott Smoyer	10728003 -TravelAccrual	Airfares - Business Travel
Scott Smoyer	10728003 -TravelAccrual	Airfares - Business Travel
Scott Smoyer	082216Hotel-48.00-5	Per Diems
Scott Smoyer	8/15/2016ClientSite<->ClientSite	Rent/Leased Cars
Scott Smoyer	08/15/2016Dfw-Bos	Airfares - Business Travel
Scott Smoyer	082216Hotel-48.00-4	Per Diems
Valerie Provost	YUL YUL-15/08/2016 0141014395579	Airfares - Business Travel
Valerie Provost	Service Fee YUL YUL-15/08/2016 0141014395579	Airfares - Business Travel
Valerie Provost	YUL YUL-22/08/2016 0141014542812	Airfares - Business Travel
Valerie Provost	Service Fee YUL YUL-22/08/2016 0141014542812	Airfares - Business Travel
Valerie Provost	YUL YUL-29/08/2016 0141014542815	Airfares - Business Travel
Valerie Provost	Service Fee YUL YUL-29/08/2016 0141014542815	Airfares - Business Travel
Valerie Provost	081516ClientSite<->Office	Taxi's
Valerie Provost	081516ClientSite<->Airport	Taxi's
Valerie Provost	081516Aloft-4	Hotel
Valerie Provost	082216ClientSite<->Airport	Taxi's
Valerie Provost	082216Other-4	Hotel
Valerie Provost	081516Parking	Parking Costs
Valerie Provost	082216Parking	Parking Costs
Valerie Provost	081516Hotel-46.00-4	Per Diems
Valerie Provost	082216Hotel-46.00-4	Per Diems

Posting date	Amount	USD
8/15/2016	639.60	USD
8/15/2016	2.82	USD
8/15/2016	2.82	USD
8/15/2016	2.82	USD
8/15/2016	26.50	USD
8/23/2016	388.76	USD
8/23/2016	17.00	USD
8/31/2016	61.63	USD
8/31/2016	25.05	USD
8/31/2016	25.85	USD
8/31/2016	212.16	USD
8/31/2016	639.60	USD
8/31/2016	566.31	USD
8/31/2016	463.32	USD
8/31/2016	2.99	USD
8/31/2016	36.95	USD
8/31/2016	396.74	USD
8/15/2016	208.00	USD
8/31/2016	208.00	USD
8/31/2016	192.00	USD
8/31/2016	144.00	USD
8/15/2016	41.05	USD
8/15/2016	5.61	USD
8/15/2016	6.89	USD
8/15/2016	605.00	USD
8/15/2016	200.42	USD
8/15/2016	17.00	USD
8/15/2016	6.08	USD
8/15/2016	3.50	USD
8/15/2016	16.00	USD
8/23/2016	131.04	USD
8/23/2016	17.00	USD
8/23/2016	177.66	USD
8/23/2016	35.00	USD
8/31/2016	50.00	USD
8/31/2016	43.00	USD
8/31/2016	36.96	USD
8/31/2016	46.56	USD
8/31/2016	88.56	USD
8/31/2016	32.50	USD
8/31/2016	46.12	USD
8/31/2016	572.65	USD
8/31/2016	226.97	USD
8/31/2016	696.91	USD
8/31/2016	203.16	USD
8/31/2016	181.54	USD
8/31/2016	366.14	USD
8/31/2016	330.69	USD
8/31/2016	20.00	USD
8/31/2016	21.48	USD
8/31/2016	17.52	USD
8/31/2016	124.69	USD
8/31/2016	59.93	USD
8/15/2016	192.00	USD
8/15/2016	240.00	USD
8/31/2016	240.00	USD
8/31/2016	144.00	USD
8/31/2016	96.00	USD
8/15/2016	189.68	USD
8/15/2016	173.46	USD
8/15/2016	580.66	USD
8/15/2016	711.04	USD

8/15/2016	28.08	USD
8/15/2016	28.08	USD
8/15/2016	28.08	USD
8/15/2016	28.08	USD
8/15/2016	671.20	USD
8/15/2016	659.96	USD
8/15/2016	15.00	USD
8/15/2016	15.00	USD
8/15/2016	586.34	USD
8/15/2016	19.25	USD
8/15/2016	192.00	USD
8/15/2016	192.00	USD
8/15/2016	218.95	USD
8/15/2016	117.37	USD
8/15/2016	251.26	USD
8/15/2016	712.93	USD
8/15/2016	4.95	USD
8/15/2016	92.00	USD
8/23/2016	330.92	USD
8/23/2016	17.00	USD
8/23/2016	330.92	USD
8/23/2016	17.00	USD
8/23/2016	368.76	USD
8/23/2016	17.00	USD
8/31/2016	108.42	USD
8/31/2016	108.90	USD
8/31/2016	220.05	USD
8/31/2016	220.05	USD
8/31/2016	5.00	USD
8/31/2016	46.00	USD
8/31/2016	46.00	USD
8/31/2016	13.90	USD
8/31/2016	18.30	USD
8/31/2016	16.40	USD
8/15/2016	96.00	USD
8/15/2016	192.00	USD
8/15/2016	48.00	USD
8/31/2016	48.00	USD
8/31/2016	96.00	USD
8/31/2016	144.00	USD
8/31/2016	441.08	USD
8/31/2016	82.00	USD
8/15/2016	65.94	USD
8/23/2016	231.21	USD
8/23/2016	35.00	USD
8/23/2016	220.88	USD
8/23/2016	35.00	USD
8/31/2016	64.31	USD
8/31/2016	62.72	USD
8/31/2016	12.27	USD
8/31/2016	40.17	USD
8/31/2016	11.34	USD
8/31/2016	11.11	USD
8/31/2016	65.94	USD
8/31/2016	37.44	USD
8/31/2016	38.28	USD
8/31/2016	224.07	USD
8/31/2016	880.20	USD
8/31/2016	889.12	USD
8/31/2016	633.54	USD
8/31/2016	8.99	USD
8/31/2016	8.99	USD
8/31/2016	281.98	USD

8/15/2016	96.00	USD
8/31/2016	144.00	USD
8/31/2016	240.00	USD
8/31/2016	144.00	USD
8/15/2016	14.52	USD
8/15/2016	52.00	USD
8/15/2016	52.00	USD
8/15/2016	52.00	USD
8/15/2016	52.00	USD
8/15/2016	599.82	USD
8/15/2016	185.75	USD
8/15/2016	426.40	USD
8/15/2016	100.00	USD
8/23/2016	341.90	USD
8/23/2016	17.00	USD
8/23/2016	83.10	USD
8/30/2016	12.56	USD
8/30/2016	241.32	USD
8/30/2016	17.00	USD
8/31/2016	34.61	USD
8/31/2016	52.00	USD
8/31/2016	22.00	USD
8/31/2016	23.00	USD
8/31/2016	52.00	USD
8/31/2016	303.44	USD
8/31/2016	639.60	USD
8/31/2016	566.31	USD
8/15/2016	192.00	USD
8/15/2016	208.00	USD
8/15/2016	52.00	USD
8/31/2016	156.00	USD
8/31/2016	192.00	USD
8/15/2016	9.51	USD
8/15/2016	9.51	USD
8/15/2016	4.75	USD
8/15/2016	21.80	USD
8/23/2016	415.80	USD
8/23/2016	35.00	USD
8/31/2016	667.47	USD
8/31/2016	17.00	USD
8/31/2016	660.15	USD
8/31/2016	14.99	USD
8/31/2016	72.00	USD
8/31/2016	703.16	USD
8/31/2016	17.00	USD
8/31/2016	72.00	USD
8/31/2016	21.80	USD
8/31/2016	2.50	USD
8/31/2016	55.00	USD
8/31/2016	72.00	USD
8/31/2016	35.00	USD
8/31/2016	8.69	USD
8/31/2016	229.86	USD
8/31/2016	224.16	USD
8/31/2016	150.82	USD
8/31/2016	74.62	USD
8/31/2016	146.30	USD
8/31/2016	665.91	USD
8/31/2016	946.11	USD
8/31/2016	220.05	USD
8/31/2016	998.33	USD
8/15/2016	576.00	USD
8/23/2016	331.82	USD

8/23/2016	35.00	USD
8/23/2016	444.70	USD
8/23/2016	17.00	USD
8/23/2016	323.35	USD
8/23/2016	17.00	USD
8/31/2016	70.00	USD
8/31/2016	70.00	USD
8/31/2016	70.00	USD
8/31/2016	70.00	USD
8/31/2016	70.00	USD
8/31/2016	41.35	USD
8/31/2016	20.00	USD
8/31/2016	20.00	USD
8/31/2016	73.38	USD
8/31/2016	17.00	USD
8/31/2016	35.00	USD
8/31/2016	20.00	USD
8/31/2016	334.48	USD
8/31/2016	188.65	USD
8/31/2016	522.04	USD
8/31/2016	135.60	USD
8/31/2016	24.80	USD
8/31/2016	27.95	USD
8/31/2016	1,020.62	USD
8/15/2016	192.00	USD
8/15/2016	192.00	USD
8/31/2016	123.00	USD
8/31/2016	208.00	USD
8/31/2016	82.00	USD
8/15/2016	220.05	USD
8/15/2016	441.97	USD
8/15/2016	215.99	USD
8/15/2016	367.00	USD
8/30/2016	505.47	USD
8/30/2016	17.00	USD
8/31/2016	31.39	USD
8/31/2016	33.40	USD
8/31/2016	35.16	USD
8/31/2016	33.25	USD
8/31/2016	6.15	USD
8/31/2016	6.63	USD
8/31/2016	32.59	USD
8/31/2016	33.00	USD
8/31/2016	18.52	USD
8/31/2016	32.59	USD
8/31/2016	33.45	USD
8/31/2016	45.34	USD
8/31/2016	13.68	USD
8/31/2016	11.53	USD
8/31/2016	17.00	USD
8/31/2016	17.00	USD
8/31/2016	17.00	USD
8/31/2016	660.15	USD
8/31/2016	660.15	USD
8/31/2016	364.84	USD
8/31/2016	192.00	USD
8/31/2016	144.00	USD
8/31/2016	192.00	USD
8/31/2016	96.00	USD
8/15/2016	16.20	USD
8/23/2016	245.10	USD
8/23/2016	741.85	USD
8/23/2016	17.00	USD

8/23/2016	783.94	USD
8/23/2016	17.00	USD
8/31/2016	267.07	USD
8/31/2016	270.66	USD
8/31/2016	880.20	USD
8/31/2016	1,249.48	USD
8/31/2016	16.20	USD
8/31/2016	16.20	USD
8/31/2016	16.20	USD
8/31/2016	16.20	USD
8/31/2016	4.99	USD
8/31/2016	21.80	USD
8/15/2016	96.00	USD
8/31/2016	240.00	USD
8/31/2016	192.00	USD
8/15/2016	52.00	USD
8/15/2016	62.00	USD
8/15/2016	62.00	USD
8/15/2016	222.06	USD
8/15/2016	240.49	USD
8/15/2016	599.82	USD
8/15/2016	599.82	USD
8/15/2016	382.60	USD
8/15/2016	17.00	USD
8/15/2016	17.00	USD
8/15/2016	20.50	USD
8/23/2016	536.60	USD
8/23/2016	400.50	USD
8/23/2016	35.00	USD
8/23/2016	204.92	USD
8/23/2016	35.00	USD
8/23/2016	129.74	USD
8/23/2016	17.00	USD
8/30/2016	175.35	USD
8/30/2016	17.00	USD
8/30/2016	175.35	USD
8/30/2016	74.00	USD
8/30/2016	149.34	USD
8/30/2016	35.00	USD
8/30/2016	200.76	USD
8/30/2016	17.00	USD
8/30/2016	144.66	USD
8/30/2016	17.00	USD
8/31/2016	21.80	USD
8/31/2016	8.00	USD
8/31/2016	2.50	USD
8/31/2016	8.99	USD
8/31/2016	4.99	USD
8/31/2016	463.70	USD
8/31/2016	328.84	USD
8/31/2016	566.31	USD
8/31/2016	111.39	USD
8/31/2016	225.93	USD
8/31/2016	62.00	USD
8/31/2016	38.16	USD
8/31/2016	47.04	USD
8/31/2016	63.20	USD
8/31/2016	62.00	USD
8/31/2016	62.00	USD
8/31/2016	156.24	USD
8/15/2016	62.00	USD
8/31/2016	62.00	USD
8/15/2016	192.00	USD

8/15/2016	192.00	USD
8/15/2016	48.00	USD
8/31/2016	52.00	USD
8/31/2016	96.00	USD
8/31/2016	104.00	USD
8/31/2016	96.00	USD
8/31/2016	192.00	USD
8/15/2016	50.00	USD
8/15/2016	62.00	USD
8/15/2016	15.83	USD
8/15/2016	32.85	USD
8/15/2016	599.82	USD
8/15/2016	578.16	USD
8/15/2016	450.06	USD
8/15/2016	667.41	USD
8/31/2016	20.00	USD
8/31/2016	5.00	USD
8/31/2016	5.00	USD
8/31/2016	5.00	USD
8/31/2016	25.00	USD
8/31/2016	30.00	USD
8/31/2016	203.90	USD
8/31/2016	334.48	USD
8/31/2016	402.28	USD
8/31/2016	239.00	USD
8/31/2016	25.00	USD
8/31/2016	25.00	USD
8/31/2016	313.82	USD
8/15/2016	192.00	USD
8/15/2016	192.00	USD
8/31/2016	192.00	USD
8/31/2016	82.00	USD
8/31/2016	104.00	USD
8/31/2016	82.00	USD
8/15/2016	112.14	USD
8/15/2016	115.98	USD
8/15/2016	6.83	USD
8/15/2016	104.68	USD
8/15/2016	85.65	USD
8/15/2016	108.21	USD
8/15/2016	109.28	USD
8/15/2016	110.04	USD
8/15/2016	280.57	USD
8/15/2016	1,119.71	USD
8/15/2016	639.83	USD
8/23/2016	362.51	USD
8/23/2016	17.00	USD
8/30/2016	222.20	USD
8/30/2016	17.00	USD
8/31/2016	2.50	USD
8/31/2016	28.30	USD
8/31/2016	25.80	USD
8/31/2016	102.75	USD
8/31/2016	108.37	USD
8/31/2016	107.18	USD
8/31/2016	112.85	USD
8/31/2016	113.11	USD
8/31/2016	116.42	USD
8/31/2016	568.31	USD
8/31/2016	566.31	USD
8/31/2016	912.00	USD
8/31/2016	30.98	USD
8/31/2016	31.57	USD

8/31/2016	31.06	USD
8/31/2016	30.79	USD
8/31/2016	30.43	USD
8/31/2016	242.36	USD
8/31/2016	676.33	USD
8/31/2016	880.20	USD
8/31/2016	405.20	USD
8/31/2016	110.75	USD
8/31/2016	123.72	USD
8/31/2016	337.30	USD
8/31/2016	521.92	USD
8/31/2016	240.00	USD
8/18/2016	201.61	USD
8/18/2016	391.20	USD
8/18/2016	192.00	USD
8/23/2016	1,189.47	USD
8/23/2016	22.79	USD
8/23/2016	1,045.64	USD
8/23/2016	15.19	USD
8/30/2016	672.40	USD
8/30/2016	15.19	USD
8/31/2016	31.32	USD
8/31/2016	32.45	USD
8/31/2016	568.32	USD
8/31/2016	49.01	USD
8/31/2016	672.11	USD
8/31/2016	61.41	USD
8/31/2016	61.41	USD
8/31/2016	184.00	USD
8/31/2016	184.00	USD

pwc

March 30, 2017

PAYMENT DUE: 04/29/17
INVOICE NUMBER : 1790075380-1

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] : Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PO #: [redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

Detailed below is PwC's Pro Forma invoice for the Gas Business Enablement Strategic Assessment project for services rendered and expenses incurred during the month of March 2017.

Labor [redacted]		
Data Assessment	$	[redacted]
Business Process Reconciliation	$	[redacted]
PMO Setup	$	[redacted]
Expenses	$	50,064.89
Other	$	136.99
Total Invoice Due By April 29, 2017	$	[redacted]

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790075380-1
Client Account Number: 5890

pwc

March 30, 2017

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

PAYMENT DUE: 04/29/17
INVOICE NUMBER : 1790075380-1

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] : Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PO #: [redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

For questions, contact: Diana O' Connor at (703) 918-3943, diana.oconnor@us.pwc.com

01065477001

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790075380-1
Client Account Number: 5890

Summary of Actuals and Pro Forma Fees and Expenses -

	Actuals	Pro Forma	
	3/1 - 3/24	3/27 - 3/31	March
Labor	[redacted]		
Data Assessment			
Business Process Reconciliation			
PMO Setup			
Expenses	$38,364.89	$11,700.00	$50,064.89
Other	$136.99	$0.00	$136.99
Total	[redacted]		

Summary of Actual Expenses Incurred -

	March					
Resource	**Airfare**	**Hotel**	**Meals**	**Car/Fuel**	**Taxis**	**TOTAL**
Alex Busam			$262.78	$671.06		$933.84
Chris Fynn	$1,235.94	$239.65	$200.65	$145.10	$112.65	$1,933.99
Clark Wang	$1,162.27	$933.86	$379.30		$247.05	$2,722.48
David Preston	$934.95	$968.90	$608.92		$584.09	$3,096.86
Diana O'Connor	$1,567.25		$242.86	$880.44	$192.01	$2,882.56
Elaine Rand	$1,200.76	$1,182.44	$155.44	$654.38		$3,193.02
Ellen McInerney	$776.20	$515.72	$11.25	$289.16	$156.00	$1,748.33
Gregory Todd	$311.45	$794.22		$494.84		$1,600.51
Gus Spivak	$1,638.95	$801.30	$15.75	$288.71	$194.00	$2,938.71
Hashmat Ahmad	$1,268.80	$1,771.12	$472.33		494.01	$4,006.26
John Owen	$2,659.07	$2,609.30	$104.22	$1,331.27		$6,703.86
Patrick Beatty	$895.38	$416.00	$255.07		354.71	$1,921.16
Samir Parkar	$2,647.87	$1,518.70	$228.77	$266.87		$4,662.21
Simon Haarhoff				$21.10		$21.10
TOTAL	**$16,298.89**	**$11,751.21**	**$2,937.34**	**$5,042.93**	**$2,334.52**	**$38,364.89**

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May 24, 2017

PAYMENT DUE: 06/23/17
INVOICE NUMBER : 1790083246-4

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PO #: [redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

Detailed below is PwC's invoice for the Gas Business Enablement Strategic Assessment project for services rendered and expenses incurred during the month of April/May 2017.

Labor [redacted]		
Data Assessment	$	[redacted]
Expenses	$	[redacted]
Other	$	9.79
Total Invoice Due By June 23, 2017	$	[redacted]

For questions, contact: Ellen McInerney at (312) 298-3392, ellen.mcinerney@us.pwc.com

01065477001

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790083246-4
Client Account Number: 5890

	March-end/April/May					
Resource	**Airfare**	**Hotel**	**Meals**	**Car/Fuel**	**Taxis**	**TOTAL**
Alex Busam				$84.91	$94.96	**$179.87**
Chris Fynn	$1,320.00	$1,434.20	$41.58	$358.32	$320.36	**$3,474.46**
David Preston		$227.20		$2.95		**$230.15**
Diana O'Connor	$361.04		$124.52	$75.08	$26.32	**$586.96**
Elaine Rand	$4,056.78	$6,218.45	$569.54	$1,719.85	$68.00	**$12,632.62**
Ellen McInerney	$448.49	$312.76	$13.75	$91.47	$50.80	**$917.27**
Gregory Todd	$1,595.87	$1,620.00		$204.93		**$3,420.80**
John Owen	$3,257.56	$7,204.31	$326.00	$2,895.52		**$13,683.39**
Ola Omiteru	$1,876.05	$2,156.51	$302.99	$1,085.28		**$5,420.83**
Patrick Beatty	$3,768.88	$3,372.94	$484.69		$1,106.19	**$8,732.70**
Richard Weber	$10,714.36	$10,108.29	$641.65	$3,772.98	$958.00	**$26,195.28**
Samir Parkar	$3,157.36	$5,078.17	$570.64	$1,011.44	$0.00	**$9,817.61**
Stuart Kenny	$1,220.36	$6,223.93	$1,240.48	$883.00	$2,438.84	**$12,006.61**
Wayne Dawson	$200.00	$200.21	$51.59		$141.14	**$592.94**
Subtotal	**$31,976.75**	**$44,156.97**	**$4,367.43**	**$12,185.73**	**$5,204.61**	**$97,891.49**
March-end Pro Forma Expenses (Invoiced on 3/30/17)						**($11,700.00)**
TOTAL						**$86,191.49**

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March 30, 2017

PAYMENT DUE: 04/29/17
INVOICE NUMBER : 1790075380-1

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] : Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PO #: [redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

Detailed below is PwC's Pro Forma invoice for the Gas Business Enablement Strategic Assessment project for services rendered and expenses incurred during the month of March 2017.

Labor [redacted]		
Data Assessment	$	[redacted]
Business Process Reconciliation	$	[redacted]
PMO Setup	$	[redacted]
Expenses	$	50,064.89
Other	$	136.99
Total Invoice Due By April 29, 2017	$	[redacted]

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790075380-1
Client Account Number: 5890

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March 30, 2017

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

PAYMENT DUE: 04/29/17
INVOICE NUMBER : 1790075380-1

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website: www.pwc.com/us/ach or call: 1 877 351 6402
PO #: [redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

For questions, contact: Diana O' Connor at (703) 918-3943, diana.oconnor@us.pwc.com

01065477001

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790075380-1
Client Account Number: 5890

Summary of Actuals and Pro Forma Fees and Expenses -

	Actuals	Pro Forma	
	3/1 - 3/24	3/27 - 3/31	March
Labor	[redacted]		
Data Assessment			
Business Process Reconciliation			
PMO Setup			
Expenses	$38,364.89	$11,700.00	$50,064.89
Other	$136.99	$0.00	$136.99
Total	[redacted]		

Summary of Actual Expenses Incurred -

	March					
Resource	**Airfare**	**Hotel**	**Meals**	**Car/Fuel**	**Taxis**	**TOTAL**
Alex Busam			$262.78	$671.06		$933.84
Chris Fynn	$1,235.94	$239.65	$200.65	$145.10	$112.65	$1,933.99
Clark Wang	$1,162.27	$933.86	$379.30		$247.05	$2,722.48
David Preston	$934.95	$968.90	$608.92		$584.09	$3,096.86
Diana O'Connor	$1,567.25		$242.86	$880.44	$192.01	$2,882.56
Elaine Rand	$1,200.76	$1,182.44	$155.44	$654.38		$3,193.02
Ellen McInerney	$776.20	$515.72	$11.25	$289.16	$156.00	$1,748.33
Gregory Todd	$311.45	$794.22		$494.84		$1,600.51
Gus Spivak	$1,638.95	$801.30	$15.75	$288.71	$194.00	$2,938.71
Hashmat Ahmad	$1,268.80	$1,771.12	$472.33		494.01	$4,006.26
John Owen	$2,659.07	$2,609.30	$104.22	$1,331.27		$6,703.86
Patrick Beatty	$895.38	$416.00	$255.07		354.71	$1,921.16
Samir Parkar	$2,647.87	$1,518.70	$228.77	$266.87		$4,662.21
Simon Haarhoff				$21.10		$21.10
TOTAL	**$16,298.89**	**$11,751.21**	**$2,937.34**	**$5,042.93**	**$2,334.52**	**$38,364.89**

pwc

March 20, 2017

PAYMENT DUE: 04/19/17
INVOICE NUMBER : 1790073944-6

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] : Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PO #: [redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

Detailed below is PwC's invoice for the Gas Business Enablement Strategic Assessment project for services rendered and expenses incurred during the month of February 2017.

Labor [redacted]		
Data Assessment	$	[redacted]
Business Process Reconciliation	$	[redacted]
PMO Setup	$	[redacted]
Expenses	$	65,005.53
Other (Presentation Materials)	$	74.87
Total Invoice Due By April 19, 2017	$	[redacted]

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790073944-6
Client Account Number: 5890

pwc

March 20, 2017

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

PAYMENT DUE: 04/19/17
INVOICE NUMBER : 1790073944-6

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

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Citibank NA, New York, NY
Account #: [redacted]
ABA #[redacted] : Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PO #[redacted]
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

For questions, contact: Diana O' Connor at (703) 918-3943, diana.oconnor@us.pwc.com

01065477001

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790073944-6
Client Account Number: 5890

	February					
Resource	**Airfare**	**Hotel**	**Per Diem/Meals**	**Rental Car/Fuel**	**Taxis**	**TOTAL**
Alex Busam				$662.35	$32.95	**$695.30**
Aseem Maggoo		$200.21	$117.94			**$318.15**
Chris Fynn	$1,317.75	$1,764.39	$81.46	$728.38	$233.92	**$4,125.90**
Clark Wang	$2,086.77	$2,168.32	$749.81	$10.00	$596.42	**$5,611.32**
David Preston	$1,425.79	$2,391.40	$993.71		$823.23	**$5,634.13**
Diana O'Connor	$771.93		$823.67	$744.33	$102.56	**$2,442.49**
Elaine Rand	$2,736.18	$2,090.41	$311.24	$720.71	$78.00	**$5,936.54**
Ellen McInerney	$721.71	$1,386.08	$90.13	$516.72	$212.50	**$2,927.14**
Evan Perlin				$82.46	$0.00	**$82.46**
Gregory Todd	$181.18	$1,760.29		$169.28	$114.18	**$2,224.93**
Gus Spivak	$1,340.99	$1,646.76	$6.42	$476.19	$388.00	**$3,858.36**
Hashmat Ahmad	$677.08	$1,346.13	$366.58		$213.34	**$2,603.13**
John Owen	$3,835.52	$3,694.46	$79.20	$2,609.76		**$10,218.94**
Lindsay Jenkins	$445.66	$481.32	$9.99		$289.56	**$1,226.53**
Matt Cardamone	$1,497.02	$1,169.16	$601.90		$336.66	**$3,604.74**
Max Mald						**$0.00**
Ola Omiteru	$2,594.91	$38.52	$1,905.49	$349.84	$888.54	**$5,777.30**
Patrick Beatty	$1,511.78	$665.45	$136.08	$16.00	$417.93	**$2,747.24**
Samir Parkar	$1,053.86	$1,293.28	$215.48	$289.04		**$2,851.66**
Simon Haarhoff	854.15	236.8	11.47	148.27	91.05	**$1,341.74**
Zachary Wilson	$443.91	$200.21	$7.00	$68.00	$58.41	**$777.53**
TOTAL	**$23,496.19**	**$22,533.19**	**$6,507.57**	**$7,591.33**	**$4,877.25**	**$65,005.53**

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NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000012436

To: PRICEWATERHOUSECOOPERS LLP
3109 W DR MLK JR BLVD
TAMPA, FL 33607

CHANGE PURCHASE ORDER (*-denotes Change)

Purchase Order No: 3200287692 **Change No:** 1 **Change Date:** 02/01/2017 **PO Date:** 01/31/2017

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-Gabby Prescott 4th Floor 2nd Ave
40 Sylvan Rd
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Amendment # 2 Strategic Assessment for National Grid's Gas Enablement program in its US Gas Business Executed January 23, 2017 Start Date of January 23, 2017 Through April 21, 2017. This is a Time and Material Engagement Labor Cost Not to Exceed [redacted] Expenses Not to Exceed [redacted] PO Cumulative Value Not to Exceed [redacted] All other terms remain constant						

PO continued on the next page

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CHANGE PURCHASE ORDER (*-denotes Change)

Purchase Order No: 3200287692 **Change No:** 1 **Change Date:** 02/01/2017 **PO Date:** 01/31/2017

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
* 1		Continued Business Assurance Activites **Line Item Changed** **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	02/01/2017
* 2		Expense Allowance **Line Item Changed** **Terms Of Delivery:**			AU			02/01/2017
3		Data Assessment (13 Weeks) **Terms Of Delivery:**			AU			01/25/2017
4		Business Process Reconciliation **Terms Of Delivery:**			AU			02/01/2017
5		Program Mgmt Office Setup Advisory SVC **Terms Of Delivery:**			AU			02/01/2017
						Net Total:	[redacted]	**USD**

PO continued on the next page

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CHANGE PURCHASE ORDER (*-denotes Change)

Purchase Order No: 3200287692 **Change No:** 1 **Change Date:** 02/01/2017 **PO Date:** 01/31/2017

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Procure to Pay Contact Center (SDC) at 1-888-4SDC-123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

We are an environmentally friendly company, please use email whenever possible.

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October 05, 2016

Kenneth Healy
Program Manager
National Grid
40 Sylvan Rd
Waltham, MA 02451
USA

PAY ASAP
overdue
PO 3200262587
C# 600711156
10/5/16

PAYMENT DUE: 11/04/16
INVOICE NUMBER : 1790052393-1

SEND CHECK PAYMENT TO:
PricewaterhouseCoopers Advisory Services LLC
P.O. Box 7247-8001
Philadelphia, PA 19170-8001

WIRE TRANSFER INSTRUCTIONS:
Citibank NA, New York, NY
Account #: [redacted]
ABA #: [redacted] : Swift #: [redacted]
To Credit: PricewaterhouseCoopers Advisory Services LLC
To initiate Automated Clearing House payments, please visit our website:
www.pwc.com/us/ach or call:
1 877 351 6402
PwC TAX ID #: [redacted]
PwC D&B #: [redacted]

PO # 3200262587

Detailed below is PwC's invoice for the Gas Business Enablement Strategic Assessment project for services rendered and expenses incurred during the month of August 2016.

Professional Services.	$	[redacted]
Expenses incurred for the month.	$	14,715.40
Total Invoice Due By November 04, 2016	$	[redacted]

Approved

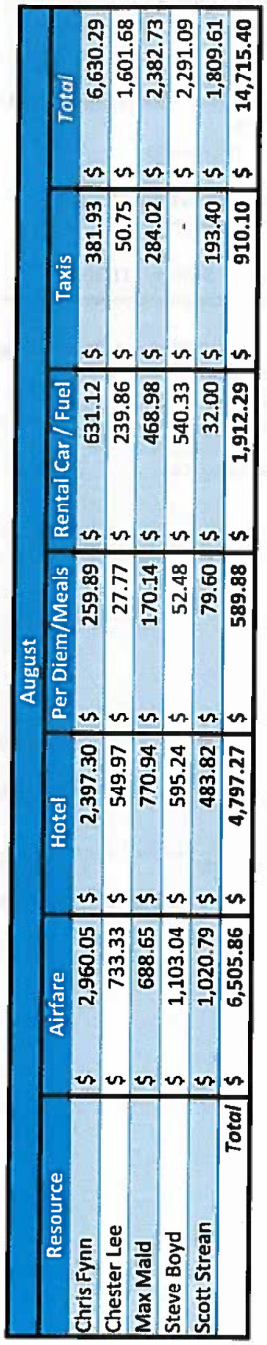
For questions, contact: Maxwell Mald at (646) 471-0088, maxwell.mald@us.pwc.com

WBS code: 01065277001, 01065478001

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE INDICATE ON YOUR PAYMENT:

Invoice Number: 1790052393-1
Client Account Number: 5890

Accounts Payable 10-05-16: 14:51:10 Received



August						
Resource	Airfare	Hotel	Per Diem/Meals	Rental Car / Fuel	Taxis	Total
Chris Fynn	$ 2,960.05	$ 2,397.30	$ 259.89	$ 631.12	$ 381.93	$ 6,630.29
Chester Lee	$ 733.33	$ 549.97	$ 27.77	$ 239.86	$ 50.75	$ 1,601.68
Max Maid	$ 688.65	$ 770.94	$ 170.14	$ 468.98	$ 284.02	$ 2,382.73
Steve Boyd	$ 1,103.04	$ 595.24	$ 52.48	$ 540.33	$ -	$ 2,291.09
Scott Strean	$ 1,020.79	$ 483.82	$ 79.60	$ 32.00	$ 193.40	$ 1,809.61
Total	$ 6,505.86	$ 4,797.27	$ 589.88	$ 1,912.29	$ 910.10	$ 14,715.40

Accounts Payable 10-05-16: 14:51:10 Received

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PURCHASE ORDER

Purchase Order No: 3200262587 **PO Date:** 09/14/2016

NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000012436

To: PRICEWATERHOUSECOOPERS LLP
3109 W DR MLK JR BLVD
TAMPA, FL 33607

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-Gabby Prescott 4th floor
52 Second Ave
Waltham MA 02451
US

Tel#: **Extn:**

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
For PO or Invoice Inquiries, call 888-483-2123 or submit a question online at www.nationalgridSDC123.com.
All Invoices must include the following:
1. PO and line number must appear on all Invoices, packages, packing slips and correspondence.
2. Name of Receiver (who accepted/signed for delivery). Failure to meet the minimum requirements may result in a delay of payment.

Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		DO NOT DUPLICATE- ADMINISTRATIVE CHANGES ONLY. 12/2/2016 PO Issued per Engagement Letter Agreement between National Grid USA Service Company, Inc. and PricewaterhouseCoopers dated July 25, 2016 and mutually signed on September 9, 2016 for Advisory Services LLC for the Provision of Advisory Services in Connection with the "Customer Experience, Mobility and Enterprise Work and Asset Management Program. National Grid has retained PwC to provide advisory services for a strategic assessment for National Grid's Gas Enablement program in its US Gas Business, as described below (the "Services"). PwC's advisory role will include: 1. Review and feedback on strategic assessment deliverables developed by a 3rd party consultant (the "Consultant") and preparation of associated work products 2. Development of four key deliverables including a plan and reports on the business design, roadmap and business case developed by the Consultant. This is a Time and Materials Engagement PO Value is not to Exceed [redacted]						

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200262587 **PO Date:** 09/14/2016

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Per National Grid Corporate Policy Background Checks Are Required						
1		Consultant travel and expenses **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	09/13/2016
2		Performance incentive **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	09/13/2016
3		Consultant Advisory **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	09/13/2016
						Net Total:	[redacted]	**USD**

PO continued on the next page

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PURCHASE ORDER

Purchase Order No: 3200262587 **PO Date:** 09/14/2016

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
  - Our General Terms and Conditions for the Purchase of Goods or Services, (as applicable); or
  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Procure to Pay Contact Center (SDC) at 1-888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

Shipping Instructions

Sales tax information

National Grid has secured Direct Pay Permits (DPP) from NY, MA, VT and RI.These permits allow National Grid and its affiliates to assess sales and use tax on the Purchase of materials and services. Therefore, please do not bill National Grid and its affiliates any sale or use tax.

Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

We are an environmentally friendly company, please use email whenever possible.

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NGUSA Service Company
40 Sylvan Road
Waltham, MA 02451

Vendor number: 1000042255

To: A T KEARNEY INC
227 W MONROE
CHICAGO, IL 60606

PURCHASE ORDER

Purchase Order No: 3200298892 **PO Date:** 03/22/2017

Buyers Name: LESLEY M RAFTER **Contact Tel:**

Contact E-mail: SDCProcurement@nationalgrid.com

Refer to last page for Terms & Conditions, Shipping Instructions and Sales Tax Information

Delivery address:
NG - USA
C/O-40 2nd ave at bldg 52 4th floor
52 Second Ave
Waltham MA 02451
US

Tel#: Extn:

Requestor Name:
Gabrielle Prescott

Delivery Instructions:

Invoice address:
AcctsPayableAdmini@nationalgrid.com

Or
NGUSA Service Company
Accounts Payable Department C-1
300 Erie Blvd West
Syracuse, NY 13202-0000

Invoice Note:
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Terms of Payment: 30 Days Net

Terms of Delivery: Prepaid and FOB Dest

***Note:**

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Gas Business Enablement Transformation Support Project ID NBI.ATK.002 Master Services Agreement effective February 7, 2017 Start Date February 27,2017 through June 26, 2017 This Statement of Work executed on March 8, 2017 This is a Time and Materials Engagement Labor Fees are not to Exceed [redacted] Travel is Capped at [redacted] National Grid Point of Contact Nicola Rigby White, Senior Director IS Global Procurement National Grid Point of Contact Kenneth Healy, Head of GBE PMO Cumulative PO Value not to Exceed [redacted]						

PO continued on the next page

We are an environmentally friendly company, please use email whenever possible.

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PURCHASE ORDER

Purchase Order No: 3200298892

PO Date: 03/22/2017

Line#	Item Id#	Description	MPN/Manufacturer	Quantity	UOM	Unit price	Net value	Delivery date
		Per National Grid Corporate Policy Background Checks Are Required Your Invoice Must Reference This Purchase Order Number						
1		Consultant **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	03/13/2017
2		Expenses **Terms Of Delivery:**		[redacted]	AU	[redacted]	[redacted]	03/13/2017
						Net Total:	[redacted]	**USD**

PO continued on the next page

We are an environmentally friendly company, please use email whenever possible.

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PURCHASE ORDER

Purchase Order No: 3200298892 **PO Date:** 03/22/2017

Standard Terms and Conditions

Conditions of Purchase:

- Goods supplied or services provided pursuant to this purchase order are either subject to:
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  - Any Terms and Conditions agreed upon or stipulated as part of any solicitation process.
- If you have questions regarding the Terms and Conditions or wish to obtain a complete copy, please contact the Procure to Pay Contact Center (SDC) at 1-888-483-2123 or submit your request online at www.nationalgridSDC123.com.
- No other conditions of contract shall apply to the Purchase Order unless previously agreed upon, in writing, by our authorized representative.

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Below is a list of all the DPPs:

NY Brooklyn	DP 0201
NY KeySpan	DP 3471
NY National Grid Generation LLC	DP 3920
NY National Grid USA Service Co.	DP 3828
NY Niagara Mohawk	DP 000006
MA Boston Gas Company	130035
MA Colonial Gas Company	130034
MA KeySpan	130011
MA Massachusetts Electric Company	130039
MA Nantucket Electric Company	130040
MA National Grid USA Service Co.	130037
MA New England Power Company	130038
RI National Grid USA Service Co.	041663150-00
RI Narragansett Electric Company	050187805-00
RI New England Power Company	041663070-00
VT National Grid USA Service Co.	41

End of the Purchase Order

We are an environmentally friendly company, please use email whenever possible.

March 29, 2017
Invoice #: US01472/0-0010

Payment Terms: Net 30 Days
Due Date: April 28, 2017

Kenneth Healy
National Grid
52 2nd Ave
Waltham, MA 02451

For professional services for Gas Enablement Transformation Support.

PO# 3200298892

Consultant	$ [redacted]
Expenses	[redacted]
	$ [redacted]

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

Investment Name	Programs	In Service Date	Exhibit __ (GIOP-9) Reference
Planned Projects			
Risk Management (Tx Mains & Dx Mains)	GBE- Asset Management	12/1/17	Exhibit __ (GIOP-9), Page 2
AM Program Leadership-1	GBE- Asset Management	3/1/18	Exhibit __ (GIOP-9), Page 14
Enhancements	GBE- Asset Management	12/1/18	Exhibit __ (GIOP-9), Page 5
Additional IM Modules	GBE- Asset Management	2/1/19	Exhibit __ (GIOP-9), Page 5
AM Program Leadership-2	GBE- Asset Management	3/1/19	Exhibit __ (GIOP-9), Page 14
Data Remediation, GIS Upgrade/ Migration & GIS Mobility	GBE- Asset Management	3/1/19	Exhibit __ (GIOP-9), Page 5
EAM-FIN Integration	GBE- Asset Management	6/1/19	Exhibit __ (GIOP-9), Page 7
Integrity Management Integrations	GBE- Asset Management	10/1/19	Exhibit __ (GIOP-9), Page 8
AM Program Leadership-3	GBE- Asset Management	3/1/20	Exhibit __ (GIOP-9), Page 14
Design (GWD), Estimating (CU), & Mobility	GBE- Asset Management	9/1/20	Exhibit __ (GIOP-9), Page 10
Asset Analytics Integration	GBE- Asset Management	12/1/20	Exhibit __ (GIOP-9), Page 11
GIS (GWD/CU) - PPM Integration	GBE- Asset Management	12/1/20	Exhibit __ (GIOP-9), Page 11
GIS-EAM Integration	GBE- Asset Management	12/2/20	Exhibit __ (GIOP-9), Page 12
AM Program Leadership-4	GBE- Asset Management	3/1/21	Exhibit __ (GIOP-9), Page 14
Use Case No.1 - Asset Risk	GBE- Asset Management	3/1/21	Exhibit __ (GIOP-9), Page 13
Complex Design (CAD) & Estimating (ESW)	GBE- Asset Management	3/1/21	Exhibit __ (GIOP-9), Page 13
Program Learning Management-1	GBE- Business Enablement	3/1/18	Exhibit __ (GIOP-9), Page 14
Program Transformational Change Office-1	GBE- Business Enablement	3/1/18	Exhibit __ (GIOP-9), Page 15
Program Business Sustainment-1	GBE- Business Enablement	3/1/19	Exhibit __ (GIOP-9), Page 15
Program Learning Management-2	GBE- Business Enablement	3/1/19	Exhibit __ (GIOP-9), Page 15
Program Transformational Change Office -2	GBE- Business Enablement	3/1/19	Exhibit __ (GIOP-9), Page 15
Program Learning Management-3	GBE- Business Enablement	3/1/20	Exhibit __ (GIOP-9), Page 15
Program Transformational Change Office-3	GBE- Business Enablement	3/1/20	Exhibit __ (GIOP-9), Page 15
Program Business Sustainment-2	GBE- Business Enablement	3/1/21	Exhibit __ (GIOP-9), Page 15
Program Learning Management-4	GBE- Business Enablement	3/1/21	Exhibit __ (GIOP-9), Page 15
Program Transformational Change Office-4	GBE- Business Enablement	3/1/21	Exhibit __ (GIOP-9), Page 15
Customer Experience Program Leadership-1	GBE- Customer Engagement	3/1/19	Exhibit __ (GIOP-9), Page 17
CxT Portal & Channel Management	GBE- Customer Engagement	6/1/19	Exhibit __ (GIOP-9), Page 7
Customer Interaction - First Release	GBE- Customer Engagement	10/1/19	Exhibit __ (GIOP-9), Page 9
Employee Support Interaction - First Release	GBE- Customer Engagement	10/1/19	Exhibit __ (GIOP-9), Page 9
Customer Experience Program Leadership-2	GBE- Customer Engagement	3/1/20	Exhibit __ (GIOP-9), Page 17
CRM / Contact Center	GBE- Customer Engagement	6/1/20	Exhibit __ (GIOP-9), Page 10
Large Commercial & Landlord Interaction	GBE- Customer Engagement	7/1/20	Exhibit __ (GIOP-9), Page 10
Employee Support Interaction - Second Release	GBE- Customer Engagement	7/1/20	Exhibit __ (GIOP-9), Page 9
Customer Interaction - Second Release	GBE- Customer Engagement	1/1/21	Exhibit __ (GIOP-9), Page 9
Customer Experience Program Leadership-3	GBE- Customer Engagement	3/1/21	Exhibit __ (GIOP-9), Page 17
Data Management Implementation (Quality & Cleansing)	GBE- Data Management	12/1/17	Exhibit __ (GIOP-9), Page 2
Data Management & Governance Program Leadership-1	GBE- Data Management	3/1/18	Exhibit __ (GIOP-9), Page 15
Enable the Data Archive Process	GBE- Data Management	3/1/19	Exhibit __ (GIOP-9), Page 6
Data Management & Governance Program Leadership-2	GBE- Data Management	3/1/19	Exhibit __ (GIOP-9), Page 15
Data Management & Governance Program Leadership-3	GBE- Data Management	3/1/20	Exhibit __ (GIOP-9), Page 15
Powerplan Remediation	GBE- Information Services Enabling	11/1/17	Exhibit __ (GIOP-9), Page 1
Comprehensive Integration Services (Enhancements)	GBE- Information Services Enabling	12/1/17	Exhibit __ (GIOP-9), Page 1
Application (Environment) Infrastructure	GBE- Information Services Enabling	12/1/17	Exhibit __ (GIOP-9), Page 1
Development Operations & BPA Enablement-1	GBE- Information Services Enabling	3/1/18	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-1	GBE- Information Services Enabling	3/1/18	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-1	GBE- Information Services Enabling	3/1/18	Exhibit __ (GIOP-9), Page 15
Operations/System Monitoring	GBE- Information Services Enabling	8/1/18	Exhibit __ (GIOP-9), Page 4
Development Operations & BPA Enablement-2	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-2	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 2-1	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-2	GBE- Information Services Enabling	3/1/19	Exhibit __ (GIOP-9), Page 15
Development Operations & BPA Enablement-3	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-3	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 2-2	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 3-1	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-3	GBE- Information Services Enabling	3/1/20	Exhibit __ (GIOP-9), Page 15
Test Automation Implementation	GBE- Information Services Enabling	12/1/20	Exhibit __ (GIOP-9), Page 12
Development Operations & BPA Enablement-4	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 15
SAP and Application Integration Development- Release 1-4	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 16
SAP and Application Integration Development- Release 3-2	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 16
Mobility CoE & End-User Computing-4	GBE- Information Services Enabling	3/1/21	Exhibit __ (GIOP-9), Page 15
Portfolio Management Leadership-1	GBE- Portfolio Office	3/1/18	Exhibit __ (GIOP-9), Page 16
Solution Architects & Agile Coaches-1	GBE- Portfolio Office	3/1/18	Exhibit __ (GIOP-9), Page 16
Portfolio Management Leadership-2	GBE- Portfolio Office	3/1/19	Exhibit __ (GIOP-9), Page 16
Solution Architects & Agile Coaches-2	GBE- Portfolio Office	3/1/19	Exhibit __ (GIOP-9), Page 16
Portfolio Management Leadership-3	GBE- Portfolio Office	3/1/20	Exhibit __ (GIOP-9), Page 16

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

Investment Name	Programs	In Service Date	Exhibit __ (GIOP-9) Reference
Solution Architects & Agile Coaches-3	GBE- Portfolio Office	3/1/20	Exhibit __ (GIOP-9), Page 16
Portfolio Management Leadership-4	GBE- Portfolio Office	3/1/21	Exhibit __ (GIOP-9), Page 16
Regulatory/ Compliance	GBE- Regulatory and Compliance	9/1/19	Exhibit __ (GIOP-9), Page 7
Supply Chain Program Leadership	GBE- Supply Chain	3/1/19	Exhibit __ (GIOP-9), Page 14
Supply Chain Program Leadership	GBE- Supply Chain	3/1/20	Exhibit __ (GIOP-9), Page 14
Business Architecture Design	GBE- Work Management	12/1/17	Exhibit __ (GIOP-9), Page 3
WMFE Program Leadership-1	GBE- Work Management	3/1/18	Exhibit __ (GIOP-9), Page 16
Corrosion and I&R Work	GBE- Work Management	7/1/18	Exhibit __ (GIOP-9), Page 4
CU Governance & Library - process	GBE- Work Management	11/1/18	Exhibit __ (GIOP-9), Page 4
WMFE Program Leadership-2	GBE- Work Management	3/1/19	Exhibit __ (GIOP-9), Page 16
Company Driven Work: Collections and non-Appointment Offs - Gas	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
Company Driven Work: Collections and non-Appointment Offs- Electric	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
Customer, Leak Investigation & Inspections - Gas	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
Customer, Leak Investigation & Inspections - Electric	GBE- Work Management	10/1/19	Exhibit __ (GIOP-9), Page 8
WMFE Program Leadership-3	GBE- Work Management	3/1/20	Exhibit __ (GIOP-9), Page 16
PowerPlan Integration & Enhancements	GBE- Work Management	6/1/20	Exhibit __ (GIOP-9), Page 10
Construction Work & Leak Repair	GBE- Work Management	9/1/20	Exhibit __ (GIOP-9), Page 11
WMFE Program Leadership-4	GBE- Work Management	3/1/21	Exhibit __ (GIOP-9), Page 16
Work Forecasting & Planning - solution	GBE- Work Management	5/1/21	In-Service After DY2 (Note 1)
Core Projects & Program Management	GBE- Work Management	6/1/21	In-Service After DY2 (Note 2)
WMFE Optimization	GBE- Work Management	3/1/22	In-Service After DY2 (Note 3)

Note 1: The Work Forecasting & Planning - solution implements single, enterprise work forecasting & planning platform with the following capabilities:
*Implements integration with Project Management, EAM, and HR (People/User) systems
*Provides one view of work and resources (internal and contract resources)
*Designs and deploys business and decision-making processes, governance, and policies including divisional nuances to support continuous improvement
*Ability to forecast through a statistical analysis of historical data, adjusted to future factors that may impact predicted volumes (e.g. weather, marketing campaigns, billing events etc.)
*Ability to optimize forecast of work to resources to meet target milestones
*Provides training on process and technology enhancements

Note 2: Core Projects & Program Management implements a Project Management platform specifically focused on scheduled/long cycle work (projects/programs) with the following capabilities:
• Planning & Scheduling
• Resource Management & Capacity Planning
• Earned Value Management
• Risk & Issue Management
• Project collaboration (design review, meeting minutes, action items)
• Funding / budgeting / forecasting
• Management of Change
• Permit management
• Emergent work tracking
• Commissioning
• Develops A81 standard work procedures, KPI's, metrics, and targets
• Develops templates and forms as necessary
• Defines processes to be automated and the design of workflows or methods to automate
• Conversion of project data
• Develops detailed implementation and training plans for end users

Note 3: WMFE Optimization implements additional capabilities of Enterprise Asset Management ("EAM") and Field Mobility along with integration to the Project Management system.
• Enhances EAM capabilities which include auto work notifications, link project info in Project Management system to work orders, job plans and PMs in EAM
• Enhances Supervisor field mobile with additional capabilities, which include view and track crew/work orders progress spatially and send notification to crews
• Implements additional field mobile capabilities including mobile red lining, GIS mobile mapping (i.e., integrated with Work Management app)
• Includes training on process and technology enhancements

Date of Request: July 21, 2017 Request No. DPS-655 AT-9
Due Date: July 31, 2017 NMPC Req. No. NM-1319

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure & Operations Panel

SUBJECT: **OP-EX COST ESTIMATES**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

For the projects listed in Exhibit__(GIOP-10) that have a total op-ex spend from 4/1/18 to 3/31/21 of $1 million or greater, provide:

1. All supporting information used to estimate the incremental operating costs listed in the Exhibit. Fully describe the cost estimation process, include any assumptions, calculations, etc., and specify the source(s) used.

2. Any vendor contracts or invoices.

Response:

1. Please refer to the Company's response to DPS-654, which includes all supporting information used to estimate the incremental operating costs listed in Exhibit __ (GIOP-10).

2. National Grid is currently negotiating vendor contracts relating to the referenced projects. There are no vendor contracts or invoices at this stage.

Name of Respondent: Date of Reply:
Michael Willard July 31, 2017

Form 103

Labor Type			FY19	FY20	FY21
O&M			57%	58%	56%
CAPEX			43%	42%	44%
Total:			100%	100%	100%
		Annual Rate			
NG Labor Category	Daily Rates	FY18	FY19	FY20	FY21
Executive	$ 1,430	$343,200	$350,064	$357,065	$364,207
Business - Non Executive	$ 908	$217,800	$222,156	$226,599	$231,131
IS - Non Executive	$ 880	$211,200	$215,424	$219,732	$224,127
# of Work Days per Year	240				
			Estimated Labor		
GBE Headcounts as of 12/31/16			FY19	FY20	FY21
Executive	19		$ 6,651,216	$ 6,784,240	$ 6,919,925
Business - Non Executive	22		$ 4,887,432	$ 4,985,181	$ 5,084,884
IS - Non Executive	1		$ 215,424	$ 219,732	$ 224,127
Total	42		$ 11,754,072	$ 11,989,153	$ 12,228,937
Estimate of GBE Labor Opex for 42 headcounts			$ 6,667,233	$ 6,916,851	$ 6,884,730
FY19-21 Annual Rate includes assumption of 2% for Labor Inflation					

Date of Request: July 21, 2017 Request No. DPS-656 AT-10
Due Date: July 31, 2017 NMPC Req. No. NM-1320

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure & Operations Panel

SUBJECT: **OP-EX COSTS**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact.

Exhibit__(GIOP-10) shows $6,667,200 of Rate Year costs that are included in the Company's base labor total. Indicate where those costs are included in the Company's Rate Year amount for base labor and how they were calculated.

Response:

The $6,667,200 of estimated Rate Year costs removed from Gas Business Enablement ("GBE") operating expense consists of base labor and associated benefits relating to 42 GBE positions that were in place prior to the end of the Historic Test Year ("HTY"). Because base labor is calculated using the HTY year-end employee headcounts, the 42 GBE positions identified were removed from GBE total Opex to avoid a double count. Please see Attachment 1 for the calculation of the removal of the GBE expense related to the 42 GBE positions.

The Company's labor expense is shown in Exhibit___(RRP-3), Schedule 23. Please refer to Exhibit___(RRP-3), Schedules 11-18, for the various benefit calculations included in the revenue requirement.

Name of Respondent: Date of Reply:
Melissa Barnes July 30, 2107
Michael Willard

Form 103

Labor Type			FY19	FY20	FY21
O&M			57%	58%	56%
CAPEX			43%	42%	44%
Total:			100%	100%	100%
		Annual Rate			
NG Labor Category	Daily Rates	FY18	FY19	FY20	FY21
Executive	$ 1,430	$343,200	$350,064	$357,065	$364,207
Business - Non Executive	$ 908	$217,800	$222,156	$226,599	$231,131
IS - Non Executive	$ 880	$211,200	$215,424	$219,732	$224,127
# of Work Days per Year	240				
			Estimated Labor		
GBE Headcounts as of 12/31/16			FY19	FY20	FY21
Executive	19		$ 6,651,216	$ 6,784,240	$ 6,919,925
Business - Non Executive	22		$ 4,887,432	$ 4,985,181	$ 5,084,884
IS - Non Executive	1		$ 215,424	$ 219,732	$ 224,127
Total	42		$ 11,754,072	$ 11,989,153	$ 12,228,937
Estimate of GBE Labor Opex for 42 headcounts			$ 6,667,233	$ 6,916,851	$ 6,884,730
FY19-21 Annual Rate includes assumption of 2% for Labor Inflation					

Date of Request: July 21, 2017 Request No. DPS-657 AT-11
Due Date: July 31, 2017 NMPC Req. No. NM-1321

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure & Operations Panel

SUBJECT: **RUN THE BUSINESS (RTB) COSTS**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

1. Exhibit__ (GIOP-11) shows a summary of incremental RTB costs for Gas Business Enablement (GBE). Provide the supporting information used to estimate the RTB costs shown on lines 1-8 of this Exhibit, by line item. Fully describe the cost estimation process and include any assumptions, calculations, etc., and specify the source(s) used.

2. Line 10 shows a forecast of the Company's current RTB costs included in the Rate Year, excluding GBE applications. Provide the support for this cost, fully describe the cost estimation process, include any assumptions, calculations, etc., and specify the source(s) used.

Response:

1. and 2.

The cost estimation process for run the business ("RTB") costs relied on five types of inputs: (1) the anticipated schedule for deploying capabilities and initiatives in the GBE roadmap; (2) estimates for software licenses, including user counts; (3) market pricing from Requests for Information and assumptions regarding any negotiated discount; (4) estimates generated by Accenture's experience with similar projects of like size; and (5) the anticipated level of support from support organizations and their respective rates.

Please see Attachment 1 for the supporting information for the line items in Exhibit __ (GIOP-11). All formulae are intact in Attachment 1.

Attachment 1 includes nine Excel sheets with more detail and notations that correspond to each summary line in Exhibit __ (GIOP-11). Note that estimates in all sheets are for total US costs rather than allocations to Niagara Mohawk. The allocation portion to Niagara Mohawk is shown on GIOP-11.

Below is a summary description and notes for each of the nine Excel sheets.

GBE-RTB – This sheet is the Excel version of Exhibit __ (GIOP-11).

Detailed RTB – This sheet is the summary sheet for all years analyzed and includes a section with some high level assumptions that were used in the estimates. Each row directly relates to each line included in Exhibit __ (GIOP-11).

Software RTB – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 1. Please refer to Excel row 12, columns C, D, and E for the "Software License Maintenance/ Subscriptions" cost summary for the Rate Year and Data Years.

Hardware RTB – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 2. Please refer to Excel row 12, columns C, D, and E for the "Hardware License Maintenance / Mobile Subscription" cost summary for the Rate Year and Data Years.

Labor RTB – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 3. Please refer to Excel row 10, columns C, D, and E for the "GBE team to support systems and applications" cost summary for the Rate Year and Data Years.

Legacy Application Replace – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 5. Please refer to Excel row 9, columns C, D, and E for the "Legacy Application Support (Replace)" cost summary for the Rate Year and Data Years. This analysis is used to determine the RTB cost of existing applications currently in use by the gas business that will gradually be replaced by new GBE functionality. The costs are based on an allocation of historic actual costs. Where applications are shared between the gas and electric businesses, the cost is allocated 47% to the gas business.

Legacy Application Future State – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 6. Please refer to row 9, columns C, D, and E for the "Legacy Application Support (Future State - non-Replace base)" cost summary for the Rate Year and Data Years. This analysis is used to determine the RTB cost of existing applications currently in use by the gas business that will not be replaced and will continue to be used in the future. The costs are based on an allocation of historic actual costs. Where applications are shared between the gas and electric businesses, the cost is allocated 47% to the gas business.

Legacy Application Future State Increase – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 7. Please refer to row 9, columns C, D, and E for the "Legacy Application Support (Future State - Increase)" cost summary for the Rate Year and Data Years. This analysis is used to determine the RTB cost of existing applications currently in use by the gas business that will not be replaced and will continue to be used in the future at an increased cost. The costs increase each year until fiscal year 2021 due to the need to improve stability of current aged systems, reduce any existing technical risk, and support new integrations with other systems. The costs are based on an allocation of historic actual costs. Where applications are shared between the gas and electric businesses, the cost is allocated 47% to the gas business.

Baseline RTB Costs – This sheet provides the supporting information for Exhibit __ (GIOP-11), line 10. Please refer to Excel row 12, columns C, D, and E for the "Current RTB Costs" summary for the Rate Year and Data Years. This analysis shows the portion of existing RTB costs that are not incremental to the GBE investment. The costs are based on an allocation of historic actual costs. Where applications are shared between the gas and electric businesses, the cost is allocated 47% to the gas business.

Name of Respondent:
Johnny Johnston
Chris Murphy
Mike Willard

Date of Reply:
July 31, 2017

Exhibit_____(GIOP-11)
Schedule 1
Page 1 of 1

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

Line	Description Of Run the Business (RTB) Costs	For 12-Months Ending March 31, 2019	For 12-Months Ending March 31, 2020	For 12-Months Ending March 31, 2021
1	Software License Maintenance / Subscriptions	$3,396,499	$7,933,079	$10,851,487
2	Hardware License Maintenance / Mobile Subscription	$1,615,176	$3,772,506	$5,160,330
3	GBE team to support systems and applications	$2,817,960	$5,635,920	$5,635,920
4	Subtotal of Additional RTB for GBE Applications	$7,829,635	$17,341,505	$21,647,737
5	Legacy Application Support (Replace)	$2,177,811	$1,662,399	$650,780
6	Legacy Application Support (Future State - non-Replace base)	$985,250	$985,250	$985,250
7	Legacy Application Support (Future State - Increase)	$49,263	$98,525	$147,788
8	Subtotal of Legacy RTB Costs	$3,212,324	$2,746,174	$1,783,818
9	Total of RTB Costs	$11,041,958	$20,087,680	$23,431,555
10	Current RTB Costs	$3,937,137	$4,647,841	$5,105,040
11	Total Incremental RTB Costs due to GBE Applications	$7,104,821	$15,439,839	$18,326,515
12	Allocation to Niagara Mohawk, Gas, Exhibit___(RRP-3), Schedule 27	$1,200,004	$2,607,789	$3,095,348

Allocation to Companies:

	Company Description	% of Customers
13	Niagara Mohawk Power Corp. - Gas	16.89%
14	KeySpan Energy Delivery New York	34.87%
15	KeySpan Energy Delivery Long Island	16.27%
16	Boston Gas Company	19.02%
17	Colonial Gas Company	5.58%
18	Narragansett Gas Company	7.37%

Line 4: Sum of Lines 1-3
Line 8: Sum of Lines 5-7
Line 9: Line 4 + Line 8
Line 11: Line 9 - Line 10
Line 12: Line 11 * Line 13

GBE RTB Schedule

	FY18	FY19	FY20	FY21	FY22	FY23
Software License Maintenance / Subscriptions	$ 1,085,149	$ 3,396,499	$ 7,933,079	$ 10,851,487	$ 10,851,487	$ 10,851,487
Hardware License Maintenance / Mobile Subscription	$ 516,033	$ 1,615,176	$ 3,772,506	$ 5,160,330	$ 5,160,330	$ 5,160,330
Labor	$ -	$ 2,817,960	$ 5,635,920	$ 5,635,920	$ 5,635,920	$ 5,635,920
[Subtotal] New RTB Costs : Additional RTB Costs for the new GBE applications	$ 1,601,182	$ 7,829,635	$ 17,341,505	$ 21,647,737	$ 21,647,737	$ 21,647,737
Legacy Application Support (Replace)	$ 2,419,790	$ 2,177,811	$ 1,662,399	$ 650,780	$	$ -
Legacy Application Support (Future State - non-Replace base)	$ 985,250	$ 985,250	$ 985,250	$ 985,250	$ 985,250	$ 985,250
Legacy Application Support (Future State - Increase)	$ -	$ 49,263	$ 98,525	$ 147,788	$ 147,788	$ 147,788
[Subtotal] Legacy RTB Costs: RTB costs for the Legacy Application Support	$ 3,405,040	$ 3,212,324	$ 2,746,174	$ 1,783,818	$ 1,133,038	$ 1,133,038
Total RTB Costs	$ 5,006,222	$ 11,041,958	$ 20,087,680	$ 23,431,555	$ 22,780,775	$ 22,780,775
Baseline - Current RTB Costs (projection based on past data)	*$ 3,575,040*	*$ 3,937,137*	*$ 4,647,841*	*$ 5,105,040*	*$ 5,105,040*	*$ 5,105,040*
RTB cost increase from baseline	*$ 1,431,182*	*$ 7,104,821*	*$ 15,439,839*	*$ 18,326,515*	*$ 17,675,735*	*$ 17,675,735*

Calculatation	SOURCES
New Software RTB	Pricing Summary (Vendor Input), Licenses (User Analysis), Industry Comparables

Key Assumptions

Hardware purchase and acqusition costs are not included here (considered an initial expense - not RTB)
EAM, WFM, DevOps, Data Management and Reporting solutions are SaaS and thus have recurring license fees uncluded in "Software License Maintenance / Subscriptions"
Labor consist of a small IS Team of 12 FTE (1200 ADR) in Steady State, and of a team of 31 (293) External FTE from the Application Service Management group.
Grade of increase in support costs follows a 10%, 21% , 42%, and 27% to Steady State for HW and SW Annual Spend
Grade of Labor Adoption is 50% and then 100%
The support costs for the legacy applications that will remain (Future State Legacy Applications) will increase by 5% until steady state (starting in FY21). Overall cost increase is 115%.
The support costs for legacy applications replaced will follow a negative ramp as their use tails off in conjunction with the GBE Roadmap

Software RTB Schedule

	FY18	FY19	FY20	FY21	FY22	FY23	INPUT	Tab	Analysis
Software License Maintenance / Subscriptions	$ 1.085.149	$ 3.396.499	$ 7.933.079	$ 10.851.487	$ 10.851.487	$ 10.851.487			

License Schedule Assumption	FY18	FY19	FY20	FY21	FY22	FY23			
Schedule Assumption (Analysis of Planned Licenses)	10%	21%	42%	27%	0%	0%	License Estimates		Developer, Pilot Licenses first year, Deployment to Users FY19-FY21
Accumlative Schedule	10%	31%	73%	100%	100%	100%			Cumulative ramp of license usage
Initial License Maintenance/Subsriptions Total	$ 1.379.928	$ 4.277.776	$ 10.073.472	$ 13.799.277	$ 13.799.277	$ 13.799.277			
Adjustments (See Schedule Below)	$ 294.779	$ 881.277	$ 2.140.393	$ 2.947.790	$ 2.947.790	$ 2.947.790			Adjustments (removals) starting in row 41
Estimated Software RTB Schedule	**$ 1.085.149**	**$ 3.396.499**	**$ 7.933.079**	**$ 10.851.487**	**$ 10.851.487**	**$ 10.851.487**			In GIOP -11

Major Saas Packages Licenses Required Assumption			
Enterprise Asset Management (EAM) Software (SAP or Maximo) License Required Assumption	4720	License Estimates	Exclude contractors due to final design may not include Software Subscription. Excluded Basic, Advanced, Admin, Developer due to final architecture, price not negotiated. These licenses can be heavily discounted. Note final number is 4750 in license estimate. Used 4720 in RTB Cost
Scheduling Software (ClickSoftware) License Required Assumption	610	License Estimates	Resource Scheduling capability range was 600-650. Used 610
Mobility (Salesforce) License Required Assumption	4520	License Estimates	Exclude contractors due to final design may not include Software Subscription. Excluded Basic, Advanced, Admin, Developer due to final architecture, price not negotiated. These licenses can be heavily discounted. Note final number is 4750 in license estimate. Used 4520 in RTB Cost
Major SaaS Packages Annual License (Subscription Costs)			
Estimated EAM License Cost Assumption (Annual/per User)	$ 2.516	Pricing	Analysis of Pricing by Vendors. Averaged two Software prices per User, include variable options, analysis of per user estimate based on RFI pricing received
Estimated Scheduling License Cost Assumption (Annual/per User)	$ 2.250	Pricing	Analysis of per user estimate based on RFI pricing received
Estimated Mobility License Cost Assumption (Annual/per User)	$ 2.700	Pricing	Averaged two Software prices per User, include variable options, analysis of per user estimate based on RFI pricing received
Major SaaS Packages Additional Discount/Final Configuration			
Estimated EAM, Scheduling, Software Additional Discount	36%		Assumed additional discount achieved through final negotations, final software configuration completed in design

Estimated Annual Software Costs	Annual Cost	Maintenace %	Analysis
EAM	$ 4.275.187		Analysis using discount, license, and annual cost above
Scheduling	$ 494.100		Analysis using discount, license, and annual cost above
Mobility	$ 4.393.440		Analysis using discount, license, and annual cost above
GIS (ArcFM/GIS)	$ 200.000		Additional Viewer Annual Cost Estimate
Document Management	$ 238.000	17%	Percentage and Base calculated on Accenture Experience. See Details Below
DevOps	$ 847.550	100%	Percentage and Base calculated on Accenture Experience. See Details Below
ETL, Data Quality	$ 396.000	20%	Percentage and Base calculated on Accenture Experience. See Details Below
Real-Time Operations Monitoiring	$ 85.000	17%	Percentage and Base calculated on Accenture Experience. See Details Below
Visualization	$ 1.100.000	100%	Percentage and Base calculated on Accenture Experience. See Details Below
Big Data Platform	$ 1.200.000	100%	Percentage and Base calculated on Accenture Experience. See Details Below
Legacy (Virtualization)	$ 60.000	10%	Percentage and Base calculated on Accenture Experience. See Details Below
Copperleaf, Oqvantek, DNV-GL (Synergi)	$ 255.000	17%	Percentage and Base calculated on Accenture Experience. See Details Below
Powerplan Environments	$ 255.000	17%	Placeholder for additional Powerplan Maintenance (users)
Total Software RTB Costs	$ 13.799.277		

Adjustments	FY18	FY19	FY20	FY21	FY22	FY23
Remove Visualization Annual Cost	$ 110.000	$ 344.298	$ 804.165	$ 1.100.000	$ 1.100.000	$ 1.100.000
Estimated Difference in Click Software, and SFDC for Mobility/Scheduling	$ 184.779	$ 536.978	$ 1.336.228	$ 1.847.790	$ 1.847.790	$ 1.847.790
Subtotal of Adjustments	$ 294.779	$ 881.277	$ 2.140.393	$ 2.947.790	$ 2.947.790	$ 2.947.790

DevOps Components	Annual Cost
Req Mgmt	4500
Project Documentation	1800
BPA Documentation	9000
Browser Test Automation	1200
Test Application Lifecyle (HP Tool)	
Test Automation	53750
Participant User	33750
Connectors	42750
Jenkins and Platform for Tools	700800
Total for DevOps	**847550**

Other Software Components	Annual Cost	Base	Percentage (Annual Cost)		Notes
Document Management	238000	$ 1.400.000	17%		RFI Pricing Response had approximately 1.6 setup and 1.4 license cost. Excluded setup and added a percentage of 17% for ongoing maintanence
ETL, Data Quality	396000	1980000	20%		Large reduction in subscriptions from Data Management: Estimate 150 Users for Dashboard at 3300/year over 4 years
Real-Time Operations Monitoiring	85000	500000	17%		<-Placeholder, another utility had software cost of 1.2M for environments. Assumption is that we have a tool to integrate with SNOW (ServiceNow) and this is just additional environments for monitoring
Visualization	1100000	1100000	100%		<-- High Tableau has a high cost for self serve analytics, Cover Alteryx
Big Data Platform	1200000	1200000	100%		<-- Leverage Accenture Data Plaform Pricing. 700K a Year. Original was $3.500.0000. Will reduce to $1M Analytics (included Amazon RWS). Plus 200K Data Archival (Hadoop) ongoing.
Legacy (Virtualization)	60000	600000	10%		Reduction after program. Reduced to 600K from $2.4M. This will cover the Spike and ongoing costs for. Slight increase for virtual environments. Assumption or risk will be that we require additional environments than plande
Copperleaf, Oqvantek, DNV-GL (Synergi)	255000	1500000	17%		Annual Maintenance
Powerplan Environments	255000	1500000	17%		

Hardware RTB Schedule

	FY18	FY19	FY20	FY21	FY22	FY23	SOURCE	Tab	Analysis
Hardware License Maintenance / Mobile Subscription	$ 516,033	$ 1,615,176	$ 3,772,506	$ 5,160,330	$ 5,160,330	$ 5,160,330			

Hardware Maintenance Assumption	FY18	FY19	FY20	FY21	FY22	FY23			
Schedule Assumption (Analysis of Planned Licenses)	10%	21%	42%	27%	0%	0%	License Estimates		Developer, Pilot Licenses first year, Deployment to Users FY19-FY21
Accumulative Schedule	10%	31%	73%	100%	100%	100%			Cumulative ramp of license usage
Initial Hardware Maintenance/Subsriptions Total	$ 516,033	$ 1,615,176	$ 3,772,506	$ 5,165,796	$ 5,165,796	$ 5,165,796			
Adjustments	$ -	$ -	$ -	$ -	$ -	$ -			
Estimated Hardware RTB Schedule	**$ 516,033**	**$ 1,615,176**	**$ 3,772,506**	**$ 5,165,796**	**$ 5,165,796**	**$ 5,165,796**			In GIOP -11

Estimated Hardware Costs	Annual Cost	
IaaS	$ 1,600,000	Assumption is that additional environments will be necessary, most of cost is in SaaS Arrangements.
Mobility HW Platform	$ 1,760,330	Percentage of Mobility Investment
Additional Hardware		Assumption is no additional hardware for infrastucture (network), software, configurations
Mobile Plan Subscription	$ 1,800,000	Subscription for cellular, data service
Total	$ 5,160,330	

Labor RTB Schedule

	FY18	FY19	FY20	FY21	FY22	FY23	SOURCE	Tab	Analysis
Labor	$ -	$ 2,817,960	$ 5,635,920	$ 5,635,920	$ 5,635,920	$ 5,635,920			

Labor Assumption	FY18	FY19	FY20	FY21	FY22	FY23			
Internal Labor	$ -	$ 1,728,000	$ 3,456,000	$ 3,456,000	$ 3,456,000	$ 3,456,000			
External Labor	$ -	$ 1,089,960	$ 2,179,920	$ 2,179,920	$ 2,179,920	$ 2,179,920			
Estimated Labor ScheduleRTB Schedule	**$ -**	**$ 2,817,960**	**$ 5,635,920**	**$ 5,635,920**	**$ 5,635,920**	**$ 5,635,920**			In GIOP-11

Estimated Labor Costs	Annual Cost	
Internal NG Labor (ADR 1200)	$ 3,456,000	12 IS resources for WMFE (3), Asset (2), Integrations/Tech (2), Data
External Labor (ADR 293)	$ 3,456,000	20%/80% onshore/offshore
Total	$ 6,912,000	

Legacy Application Support Replace RTB Schedule

	FY18	FY19	FY20	FY21	FY22	FY23	SOURCE	Tab	Analysis
Legacy Application Support (Replace)	$ 2,419,790	$ 2,177,811	$ 1,662,399	$ 650,780	$ -	$ -	Allocation of Actuals		

Estimated Legacy Application Support (Replace)	FY18	FY19	FY20	FY21	FY22	FY23			
Schedule Estimate	100%	90%	69%	27%	0%	0%			Represents a tailing off of the use of legacy applications based on GIOP-11
Estimated Legacy Application Support	$ 2,419,790	$ 2,177,811	$ 1,662,399	$ 650,780	$ -	$ -			

Application Gas Process ($000,s)	Electric/Gas	Gas	Meter to Cash Elect & Gas	Meter to Cash. Gas	Grand Total	Filter Flag	Gas Application Cost Only	Shared Application Cost - Gas Portion - 47%	Total
								47%	
(AVAYA) INTERACTIVE				116	116	No	-	-	-
(Avaya) Interactive Voice Response			22		22	No	-	-	-
Agent Desktop				254	254	Replace	-	-	-
AIMMS	32				32	No	-	15	15
ALLEGRO		465			465	No	465	-	465
ArcFM Viewer		59			59	Replace	59	-	59
ARCFM/GIS-NE		201			201	Future State	201	-	201
ARCOS	6				6	Future State	-	3	3
Automated Roster Call Out System (ARCOS)	15				15	Future State	-	7	7
AVLS	476				476	Replace	-	224	224
Bentley Redline	119				119	No	-	56	56
CAD / CAF Systems	12				12	No	-	6	6
CAD/CAE	104				104	No	-	49	49
CADHIST	35				35	Replace	-	16	16
Cascade (Gas)		30			30	Replace	30	-	30
Cash Receipts Data Entry Manager (cris iii)				5	5	Future State	-	-	-
Checkmeter	22				22	No	-	10	10
CITRIX	6				6	No	-	3	3
CITRIX - ECS	5				5	Replace	-	2	2
Combustible Gas Indicator Test (CGI) (ncad) (pragmaCAD)		17			17	No	17	-	17
Company Managed Contract Services-NE		8		3	11	No	8	-	8
Contractor Charges (CCH)	43				43	Replace	-	20	20
Corridor Manager/Smallworld	42				42	Replace	-	20	20
CORROSION CONTROL WO		4			4	Replace	4	-	4
CSC US INFRA CITRIX		5			5	No	5	-	5
CSS			11,759		11,759	No	-	-	-
CSS IVR			87		87	No	-	-	-
Customer Accounting System (CAS)			20		20	No	-	-	-
Customer Insights and Analysis (CIAP)				22	22	No	-	-	-
Customer Relations Information System (CRIS III)				3,172	3,172	No	-	-	-
CUTCAP		3			3	No	3	-	3
CWO		152			152	Replace	152	-	152
Damage Tracking System (DTS)		22			22	No	22	-	22
Demand Side Management	3				3	No	-	1	1
DIGSAFE-NE		49			49	No	49	-	49
DIS		9			9	Replace	9	-	9
DPMS		2			2	Replace	2	-	2
DSM (Demand Side Management)	312				312	No	-	147	147
DTS		8			8	No	8	-	8
EBB Database		70			70	No	70	-	70
ECONOMIC INCENTIVE R				9	9	No	-	-	-
Economic Incentive Rates (cris iii)				2	2	Future State	-	-	-
EDI (cris iii)				79	79	No	-	-	-
EDI (cris iii)				25	25	No	-	-	-
ELWARD	11				11	No	-	5	5
Electronic Bulletin Board (EBB)		2			2	No	2	-	2
Endpoint Processing System (EPS)	4				4	No	-	2	2
Energy Resource System (ERS)	12				12	No	-	6	6
E-Permits		45			45	Future State	45	-	45
EPO	21				21	No	-	10	10
EPO Real Time Transfer	7				7	No	-	3	3
ERS	36				36	No	-	17	17
ESRI	878				878	Future State	-	413	413
ESRI (GIS) (US)	28				28	Future State	-	13	13
Feeder Hardening	4				4	Replace	-	2	2
FeedPro/SupplyPro/Feeder-Health	3				3	No	-	1	1
Field Collection System (FCS)	78				78	Replace	-	37	37
FIS		3			3	No	3	-	3
FIS SERVER SUPPORT		8			8	No	8	-	8
Fluke Met Team/Cal	52				52	No	-	24	24
FMF	12				12	No	-	6	6
FORTIS-NE		37			37	Replace	37	-	37
FSO		56			56	No	56	-	56
Gas Leak Tracking		10			10	Replace	10	-	10
Gas Pricing		3			3	No	3	-	3
GAS RECORDERS		19			19	No	19	-	19
Gas Sales Proposals (GSP)		5			5	No	5	-	5
Gas T Readings Entry System		2			2	No	2	-	2
Gas Transportation Information System (GTIS)		73			73	No	73	-	73
GasCar		4			4	No	4	-	4
GASCAR SA		9			9	No	9	-	9
GASWEB WEB SERVER		4			4	No	4	-	4
GIS Aerial Images	1				1	No	-	0	0
GIS Application Suite	444				444	Replace	-	209	209
Government Construction System-NE		5			5	No	5	-	5
Grip		2			2	No	2	-	2
GSA				13	13	No	-	-	-
GTIS		90			90	No	90	-	90
HD Reporting System		1			1	No	1	-	1
Ischeduler	629				629	Replace	-	296	296
IVR (CSS)			348		348	No	-	-	-
IVR Web Services Support			15		15	No	-	-	-
Java CAPS	77				77	Replace	-	36	36
JCAPS - US - MWORK	105				105	Replace	-	49	49
Joint Pole Proposal	4				4	No	-	2	2
JPP/EON Tracking System	5				5	No	-	2	2
Leak Management Systems (LMS-LI)		7			7	Replace	7	-	7
Leak Management Systems (LMS-NYC)		7			7	Replace	7	-	7
Leak Management Systems-NE		16			16	Replace	16	-	16
Leak Survey		5			5	Replace	5	-	5
LNG Plant Maintenance		1			1	No	1	-	1
Mandatory Hourly Pricing	1				1	No	-	0	0
MAPFRAME	110				110	Replace	-	52	52
MAPS	45				45	No	-	21	21
MAPVIEW	10				10	No	-	5	5
Mapview	2				2	No	-	1	1
MAXIMO		4			4	Replace	4	-	4
MAXIMO/SAP INTERFACE		7			7	Replace	7	-	7
MAXIMO-T&D		52			52	Replace	52	-	52
MDS Web	28				28	No	-	13	13
MDSI (Core)		2			2	Replace	2	-	2
MDSI GAS		6			6	Replace	6	-	6
MDSI-Gas (NY)		763			763	Replace	763	-	763
MDSI-NE (GAS)		52			52	Replace	52	-	52
Meter Inventory Tracking System	32				32	Replace	-	15	15
Meter Statistics-NE	5				5	Replace	-	2	2
Metretek AMR 2009	6				6	No	-	3	3
Metretek- NY (KeySpan)	14				14	No	-	7	7
Microstation / Virtual Print Room	2				2	Replace	-	1	1
Mobile Materials Assistant (MMA)		22			22	No	22	-	22
Mv90	4				4	Replace	-	2	2
Mv90 - RI	9				9	Replace	-	4	4
MVRS		9			9	No	9	-	9
MWORK (FFE)	189				189	Replace	-	89	89
Myquotes		22			22	Replace	22	-	22
Nerc-CIP Automation	3				3	No	-	1	1
NETMOTION		75			75	No	75	-	75
NUCLEUS (RMS)		27			27	No	27	-	27
NYISO	3				3	No	-	1	1
ONYX (CORE)		8			8	No	8	-	8
Oracle Messaging Gateway support	8				8	No	-	4	4
OSISoft Process Information (PI) (NE)		23			23	No	23	-	23
P6 ANALYTICS	23				23	Future State	-	11	11
Paving (NYC)		12			12	Replace	12	-	12
Paving DB, Pave Seed, Restoration DB		3			3	Replace	3	-	3
Permits	3				3	Replace	-	1	1
Phasor	19				19	No	-	9	9
Phasor Measurement Unit (PMU) (NY/NE)	11				11	No	-	5	5
Pipeline Compliance System (PCS)		28			28	Future State	28	-	28
Planned Outage	3				3	No	-	1	1
Power Quality	2				2	No	-	1	1
PowerPlan	425				425	Future State	-	200	200
PRM		1			1	No	1	-	1
Regulators		3			3	No	3	-	3
Resource on Demand (RODs)	1				1	Replace	-	0	0
RI TSA (Transportation Services Application – Rhode Island)				62	62	No	-	-	-
RMVRT Route Manager VRT		18			18	No	18	-	18
SALES INVESTIGATION		7			7	No	7	-	7
SCO TRANSMISSION		16			16	No	16	-	16
Service Pipe System-NE		8			8	No	8	-	8
SMALL WORLD	51				51	Replace	-	24	24
SNAP		1			1	No	1	-	1
SOP (Gas Control)		65			65	Future State	65	-	65
STORM Archive tool	10				10	Replace	-	5	5
Storm Damage Assessment (SDA)	27				27	No	-	13	13
STORMS	103				103	Replace	-	48	48
SynerGEE Gas		4			4	Replace	4	-	4
The World				2	2	No	-	-	-
Transmission Service Agreements / Transmission Service Contracts (TSA/TSC)	4				4	No	-	2	2
Transportation Services Application (TSA) (RI)				20	20	No	-	-	-
Transportation System - Electronic Bulletin Board (EBB) (Gas)		32			32	No	32	-	32
TSA				52	52	No	-	-	-
UGBPS	7				7	No	-	3	3
Underground facility applications (to Digsafe, Digsafely locating)		2			2	No	2	-	2
US Retail Web			22		22	No	-	-	-
US Retail Web - DBA			18		18	No	-	-	-
US Retail Web - Your Account			267		267	No	-	-	-
US Retail Web - Your Account App Server			35		35	No	-	-	-
Vantage IM		9			9	No	9	-	9
WardFuel System (El Ward NGUS)	8				8	No	-	4	4
WEB BASED SIR SOLUTION	9				9	No	-	4	4
Web Based SIR Solution - External Customer	1				1	No	-	0	0
Web Based SIR Solution - Internal Business	1				1	No	-	0	0
Wholesale Settlement Application	14				14	No	-	7	7
WINFILER	4				4	No	-	2	2
ZEMA		8			8	No	8	-	8

Row Labels	Sum of Gas Application Cost Only	Sum of Shared Application Cost - Gas Portion - 47%	Sum of Total
Future State	339	646.25	985.25
Replace	1265	1154.79	2419.79
Grand Total	**1604**	**1801.04**	**3405.04**

Legacy Application Support Non-Replace RTB Schedule

	FY18	FY19	FY20	FY21	FY22	FY23	SOURCE	Tab	Analysis
Legacy Application Support (Future State - non-Replace base)	$ 985,250	$ 985,250	$ 985,250	$ 985,250	$ 985,250	$ 985,250	Allocation of Actuals		

Estimated Legacy Applciation Support (Future State)	FY18	FY19	FY20	FY21	FY22	FY23
Schedule Estimate	100%	100%	100%	100%	100%	100%
Estimated Legacy Application Support (Future State)	$ 985,250	$ 985,250	$ 985,250	$ 985,250	$ 985,250	$ 985,250

Application Gas Process ($000,s)	Electric/Gas	Gas	Meter to Cash Elect & Gas	Meter to Cash Gas	Grand Total	Filter Flag	Gas Application Cost Only	Shared Application Cost - Gas Portion - 47%	Total
								47%	
(AVAYA) INTERACTIVE				$ 115	$ 115	No	$ -	$ -	$ -
(Avaya) Interactive Voice Response			$ 22		$ 22	No	$ -	$ -	$ -
Agent Desktop				$ 254	$ 254	Replace	$ -	$ -	$ -
AIMMS	$ 32				$ 32	No	$ -	$ 15	$ 15
ALLEGRO		$ 465			$ 465	No	$ 465	$ -	$ 465
ArcFM Viewer		$ 59			$ 59	Replace	$ 59	$ -	$ 59
ARCFM/GIS-NE		$ 201			$ 201	Future State	$ 201	$ -	$ 201
ARCOS	$ 6				$ 6	Future State	$ -	$ 3	$ 3
Automated Roster Call Out System (ARCOS)	$ 15				$ 15	Future State	$ -	$ 7	$ 7
AVLS	$ 476				$ 476	Replace	$ -	$ 224	$ 224
Bentley Redline	$ 119				$ 119	No	$ -	$ 56	$ 56
CAD / CAE Systems	$ 12				$ 12	No	$ -	$ 6	$ 6
CAD/CAE	$ 104				$ 104	No	$ -	$ 49	$ 49
CADHIST	$ 35				$ 35	Replace	$ -	$ 16	$ 16
Cascade (Gas)		$ 30			$ 30	Replace	$ 30	$ -	$ 30
Cash Receipts Data Entry Manager (cris iii)				$ 5	$ 5	Future State	$ -	$ -	$ -
Checkmeter	$ 22				$ 22	No	$ -	$ 10	$ 10
CITRIX	$ 6				$ 6	No	$ -	$ 3	$ 3
CITRIX - FCS	$ 5				$ 5	Replace	$ -	$ 2	$ 2
Combustible Gas Indicator Test (CGI) (ncad) (pragmaCAD)		$ 17			$ 17	No	$ 17	$ -	$ 17
Company Managed Contract Services-NE		$ 8		$ 3	$ 11	No	$ 8	$ -	$ 8
Contractor Charges (CCH)	$ 42				$ 42	Replace	$ -	$ 20	$ 20
Corridor Manager/Smallworld	$ 42				$ 42	Replace	$ -	$ 20	$ 20
CORROSION CONTROL WO		$ 4			$ 4	Replace	$ 4	$ -	$ 4
CSC US INFRA CITRIX		$ 5			$ 5	No	$ 5	$ -	$ 5
CSS			$ 11,759		$ 11,759	No	$ -	$ -	$ -
CSS IVR			$ 87		$ 87	No	$ -	$ -	$ -
Customer Accounting System (CAS)			$ 20		$ 20	No	$ -	$ -	$ -
Customer Insights and Analysis (CIAP)				$ 22	$ 22	No	$ -	$ -	$ -
Customer Relations Information System (CRIS III)				$ 3,172	$ 3,172	No	$ -	$ -	$ -
CUTCAP		$ 3			$ 3	No	$ 3	$ -	$ 3
CWO		$ 152			$ 152	Replace	$ 152	$ -	$ 152
Damage Tracking System (DTS)		$ 22			$ 22	No	$ 22	$ -	$ 22
Demand Side Management	$ 3				$ 3	No	$ -	$ 1	$ 1
DIGSAFE-NE		$ 49			$ 49	No	$ 49	$ -	$ 49
DIS		$ 9			$ 9	Replace	$ 9	$ -	$ 9
DPMS		$ 2			$ 2	Replace	$ 2	$ -	$ 2
DSM (Demand Side Management)	$ 312				$ 312	No	$ -	$ 147	$ 147
DTS		$ 8			$ 8	No	$ 8	$ -	$ 8
ERP Database		$ 70			$ 70	No	$ 70	$ -	$ 70
ECONOMIC INCENTIVE R				$ 9	$ 9	No	$ -	$ -	$ -
Economic Incentive Rates (cris iii)				$ 2	$ 2	Future State	$ -	$ -	$ -
EDI (cris iii)				$ 79	$ 79	No	$ -	$ -	$ -
EDI (cris iii)				$ 25	$ 25	No	$ -	$ -	$ -
ELWARD	$ 11				$ 11	No	$ -	$ 5	$ 5
Electronic Bulletin Board (EBB)		$ 2			$ 2	No	$ 2	$ -	$ 2
Endpoint Processing System (EPS)	$ 4				$ 4	No	$ -	$ 2	$ 2
Energy Resource System (ERS)	$ 12				$ 12	No	$ -	$ 6	$ 6
E-Permits		$ 45			$ 45	Future State	$ 45	$ -	$ 45
EPO	$ 21				$ 21	No	$ -	$ 10	$ 10
EPO Real Time Transfer	$ 7				$ 7	No	$ -	$ 3	$ 3
ERS	$ 36				$ 36	No	$ -	$ 17	$ 17
ESRI	$ 878				$ 878	Future State	$ -	$ 413	$ 413
ESRI (GIS) (US)	$ 28				$ 28	Future State	$ -	$ 13	$ 13
Feeder Hardening	$ 4				$ 4	Replace	$ -	$ 2	$ 2
FeedPro/SupplyPro/Feeder Health	$ 3				$ 3	No	$ -	$ 1	$ 1
Field Collection System (FCS)	$ 79				$ 79	Replace	$ -	$ 37	$ 37
FIS		$ 3			$ 3	No	$ 3	$ -	$ 3
FIS SERVER SUPPORT		$ 8			$ 8	No	$ 8	$ -	$ 8
Fluke Met Team/Cal	$ 52				$ 52	No	$ -	$ 24	$ 24
FMF	$ 12				$ 12	No	$ -	$ 6	$ 6
FORTIS-NE		$ 37			$ 37	Replace	$ 37	$ -	$ 37
FSD		$ 56			$ 56	No	$ 56	$ -	$ 56
Gas Leak Tracking		$ 10			$ 10	Replace	$ 10	$ -	$ 10
Gas Pricing		$ 3			$ 3	No	$ 3	$ -	$ 3
GAS RECORDERS		$ 19			$ 19	No	$ 19	$ -	$ 19
Gas Sales Proposals (GSP)		$ 5			$ 5	No	$ 5	$ -	$ 5
Gas T Readings Entry System		$ 2			$ 2	No	$ 2	$ -	$ 2
Gas Transportation Information System (GTIS)		$ 73			$ 73	No	$ 73	$ -	$ 73
GasCar		$ 4			$ 4	No	$ 4	$ -	$ 4
GASCAR SA		$ 9			$ 9	No	$ 9	$ -	$ 9
GASWEB WEB SERVER		$ 4			$ 4	No	$ 4	$ -	$ 4
GIS Aerial Images	$ 1				$ 1	No	$ -	$ 0	$ 0
GIS Application Suite	$ 444				$ 444	Replace	$ -	$ 209	$ 209
Government Construction System-NE		$ 5			$ 5	No	$ 5	$ -	$ 5
Grip		$ 2			$ 2	No	$ 2	$ -	$ 2
GSA				$ 13	$ 13	No	$ -	$ -	$ -
GTIS		$ 90			$ 90	No	$ 90	$ -	$ 90
HD Reporting System		$ 1			$ 1	No	$ 1	$ -	$ 1
Ischeduler	$ 629				$ 629	Replace	$ -	$ 296	$ 296
IVR (CSS)			$ 348		$ 348	No	$ -	$ -	$ -
IVR Web Services Support			$ 15		$ 15	No	$ -	$ -	$ -
Java CAPS	$ 77				$ 77	Replace	$ -	$ 36	$ 36
ICAPS - US - MWORK	$ 105				$ 105	Replace	$ -	$ 49	$ 49
Joint Pole Proposal	$ 4				$ 4	No	$ -	$ 2	$ 2
IPP/EON Tracking System	$ 5				$ 5	No	$ -	$ 2	$ 2
Leak Management Systems (LMS-LI)		$ 7			$ 7	Replace	$ 7	$ -	$ 7
Leak Management Systems (LMS-NYC)		$ 7			$ 7	Replace	$ 7	$ -	$ 7
Leak Management Systems-NE		$ 16			$ 16	Replace	$ 16	$ -	$ 16
Leak Survey		$ 5			$ 5	Replace	$ 5	$ -	$ 5
LNG Plant Maintenance		$ 1			$ 1	No	$ 1	$ -	$ 1
Mandatory Hourly Pricing	$ 1				$ 1	No	$ -	$ 0	$ 0
MAPFRAME	$ 110				$ 110	Replace	$ -	$ 52	$ 52
MAPS	$ 45				$ 45	No	$ -	$ 21	$ 21
MAPVIEW	$ 10				$ 10	No	$ -	$ 5	$ 5
Mapview	$ 2				$ 2	No	$ -	$ 1	$ 1
MAXIMO		$ 4			$ 4	Replace	$ 4	$ -	$ 4
MAXIMO/SAP INTERFACE		$ 7			$ 7	Replace	$ 7	$ -	$ 7
MAXIMO-TRD		$ 52			$ 52	Replace	$ 52	$ -	$ 52
MDS Web	$ 28				$ 28	No	$ -	$ 13	$ 13
MDSI (Core)		$ 2			$ 2	Replace	$ 2	$ -	$ 2
MDSI GAS		$ 6			$ 6	Replace	$ 6	$ -	$ 6
MDSI-Gas (NY)		$ 763			$ 763	Replace	$ 763	$ -	$ 763
MDSI-NE (GAS)		$ 52			$ 52	Replace	$ 52	$ -	$ 52
Meter Inventory Tracking System	$ 32				$ 32	Replace	$ -	$ 15	$ 15
Meter Statistics-NE	$ 5				$ 5	Replace	$ -	$ 2	$ 2
Metretek AMR 2009	$ 6				$ 6	No	$ -	$ 3	$ 3
Metretek- NY (KeySpan)	$ 14				$ 14	No	$ -	$ 7	$ 7
Microstation / Virtual Print Room	$ 2				$ 2	Replace	$ -	$ 1	$ 1
Mobile Materials Assistant (MMA)		$ 22			$ 22	No	$ 22	$ -	$ 22
Mv90	$ 4				$ 4	Replace	$ -	$ 2	$ 2
Mv90 - RI	$ 9				$ 9	Replace	$ -	$ 4	$ 4
MVRS		$ 9			$ 9	No	$ 9	$ -	$ 9
MWORK (EEE)	$ 189				$ 189	Replace	$ -	$ 89	$ 89
Mwwater		$ 22			$ 22	Replace	$ 22	$ -	$ 22
Ness-CLR Automation	$ 3				$ 3	No	$ -	$ 1	$ 1
NETMOTION		$ 75			$ 75	No	$ 75	$ -	$ 75
NUCLEUS (RMS)		$ 27			$ 27	No	$ 27	$ -	$ 27
NYISO	$ 3				$ 3	No	$ -	$ 1	$ 1
ONYX (CORE)		$ 8			$ 8	No	$ 8	$ -	$ 8
Oracle Messaging Gateway support	$ 8				$ 8	No	$ -	$ 4	$ 4
OSISoft Process Information (PI) (NE)		$ 23			$ 23	No	$ 23	$ -	$ 23
P6 ANALYTICS	$ 23				$ 23	Future State	$ -	$ 11	$ 11
Paving (NYC)		$ 12			$ 12	Replace	$ 12	$ -	$ 12
Paving DB, Pave Seed, Restoration DB		$ 3			$ 3	Replace	$ 3	$ -	$ 3
Permits	$ 3				$ 3	Replace	$ -	$ 1	$ 1
Phasor	$ 19				$ 19	No	$ -	$ 9	$ 9
Phasor Measurement Unit (PMU) (NY/NE)	$ 11				$ 11	No	$ -	$ 5	$ 5
Pipeline Compliance System (PCS)		$ 28			$ 28	Future State	$ 28	$ -	$ 28
Planned Outage	$ 3				$ 3	No	$ -	$ 1	$ 1
Power Quality	$ 2				$ 2	No	$ -	$ 1	$ 1
PowerPlan	$ 425				$ 425	Future State	$ -	$ 200	$ 200
PRM		$ 1			$ 1	No	$ 1	$ -	$ 1
Regulators		$ 3			$ 3	No	$ 3	$ -	$ 3
Resource on Demand (RODs)	$ 1				$ 1	Replace	$ -	$ 0	$ 0
RI TSA (Transportation Services Application – Rhode Island)				$ 62	$ 62	No	$ -	$ -	$ -
RMVRT Route Manager VRT		$ 18			$ 18	No	$ 18	$ -	$ 18
SALES INVESTIGATION		$ 7			$ 7	No	$ 7	$ -	$ 7
SCO TRANSMISSION		$ 16			$ 16	No	$ 16	$ -	$ 16
Service Pipe System-NE		$ 8			$ 8	No	$ 8	$ -	$ 8
SMALLWORLD	$ 51				$ 51	Replace	$ -	$ 24	$ 24
SNAP		$ 1			$ 1	No	$ 1	$ -	$ 1
SOP (Gas Control)		$ 65			$ 65	Future State	$ 65	$ -	$ 65
STORM Archive tool	$ 10				$ 10	Replace	$ -	$ 5	$ 5
Storm Damage Assessment (SDA)	$ 27				$ 27	No	$ -	$ 13	$ 13
STORMS	$ 103				$ 103	Replace	$ -	$ 48	$ 48
SynerGEE Gas		$ 4			$ 4	Replace	$ 4	$ -	$ 4
The World				$ 2	$ 2	No	$ -	$ -	$ -
Transmission Service Agreements / Transmission Service Contracts (TSA/TSC)	$ 4				$ 4	No	$ -	$ 2	$ 2
Transportation Services Application (TSA) (RI)				$ 20	$ 20	No	$ -	$ -	$ -
Transportation System - Electronic Bulletin Board (EBB) (Gas)		$ 32			$ 32	No	$ 32	$ -	$ 32
TSA				$ 52	$ 52	No	$ -	$ -	$ -
USRPS	$ 7				$ 7	No	$ -	$ 3	$ 3
Underground facility applications (to Digsafe, Digsafelylocating)		$ 2			$ 2	No	$ 2	$ -	$ 2
US Retail Web			$ 22		$ 22	No	$ -	$ -	$ -
US Retail Web - DBA			$ 18		$ 18	No	$ -	$ -	$ -
US Retail Web - Your Account			$ 767		$ 767	No	$ -	$ -	$ -
US Retail Web - Your Account App Server			$ 35		$ 35	No	$ -	$ -	$ -
Vantage LM		$ 9			$ 9	No	$ 9	$ -	$ 9
WardFuel System (El Ward NSUS)	$ 8				$ 8	No	$ -	$ 4	$ 4
WEB BASED SIR SOLUTION	$ 9				$ 9	No	$ -	$ 4	$ 4
Web Based SIR Solution - External Customer	$ 1				$ 1	No	$ -	$ 0	$ 0
Web Based SIR Solution - Internal Business	$ 1				$ 1	No	$ -	$ 0	$ 0
Wholesale Settlement Application	$ 14				$ 14	No	$ -	$ 7	$ 7
WINSUER	$ 4				$ 4	No	$ -	$ 2	$ 2
ZEMA		$ 8			$ 8	No	$ 8	$ -	$ 8

Row Labels	Sum of Gas Application Cost Only	Sum of Shared Application Cost - Gas Portion - 47%	Sum of Total
Future State	339	646.25	985.25
Replace	1265	1154.79	2419.79
Grand Total	**1604**	**1801.04**	**3405.04**

Legacy Application Support (Future State - Increase)

	FY18	FY19	FY20	FY21	FY22	FY23	SOURCE	Tab
Legacy Application Support (Future State - Increase)	$ -	$ 49,263	$ 98,525	$ 147,788	$ 147,788	$ 147,788		

Estimated Legacy Application Support (Future State Increase)	FY18	FY19	FY20	FY21	FY22	FY23	
Schedule Estimate	0%	5%	10%	15%	15%	15%	Assumed 5% increase per year through FY21
Estimated Legacy Application Support (Future State)	$ -	$ 49,263	$ 98,525	$ 147,788	$ 147,788	$ 147,788	In GIOP-11

Application Gas Process ($000,s)	Electric/Gas	Gas	Meter to Cash Elect & Gas	Meter to Cash, Gas	Grand Total	Filter Flag	Gas Application Cost Only	47% Shared Application Cost - Gas Portion - 47%	Total
(AVAYA) INTERACTIVE				$ 116	$ 116	No	$ -	$ -	$ -
(Avaya) Interactive Voice Response			$ 22		$ 22	No	$ -	$ -	$ -
Agent Desktop				$ 254	$ 254	Replace	$ -	$ -	$ -
AIMMS	$ 32				$ 32	No	$ -	$ 15	$ 15
ALLEGRO		$ 465			$ 465	No	$ 465	$ -	$ 465
AnyPal Viewer		$ 59			$ 59	Replace	$ 59	$ -	$ 59
ARCFM/GIS-NE		$ 201			$ 201	Future State	$ 201	$ -	$ 201
ARCOS	$ 6				$ 6	Future State	$ -	$ 3	$ 3
Automated Roster Call Out System (ARCOS)	$ 15				$ 15	Future State	$ -	$ 7	$ 7
AVL1	$ 476				$ 476	Replace	$ -	$ 224	$ 224
Bentley Redline	$ 119				$ 119	No	$ -	$ 56	$ 56
CAD / CAE Systems	$ 12				$ 12	No	$ -	$ 6	$ 6
CAD/CAE	$ 104				$ 104	No	$ -	$ 49	$ 49
CADHIST	$ 35				$ 35	Replace	$ -	$ 16	$ 16
Cascade (Gas)		$ 30			$ 30	Replace	$ 30	$ -	$ 30
Cash Receipts Data Entry Manager (cris iii)				$ 5	$ 5	Future State	$ -	$ -	$ -
Checkmeter	$ 22				$ 22	No	$ -	$ 10	$ 10
CITRIX	$ 6				$ 6	No	$ -	$ 3	$ 3
CITRIX - FCS	$ 5				$ 5	Replace	$ -	$ 2	$ 2
Combustible Gas Indicator Test (CGI) (pcad) (pragmaCAD)		$ 17			$ 17	No	$ 17	$ -	$ 17
Company Managed Contract Services-NE		$ 8		$ 3	$ 11	No	$ 8	$ -	$ 8
Contractor Charges (CCH)	$ 43				$ 43	Replace	$ -	$ 20	$ 20
Corridor Manager/Smallworld	$ 42				$ 42	Replace	$ -	$ 20	$ 20
CORROSION CONTROL WO		$ 4			$ 4	Replace	$ 4	$ -	$ 4
CSC US INFRA CITRIX		$ 5			$ 5	No	$ 5	$ -	$ 5
CSS			$ 11,759		$ 11,759	No	$ -	$ -	$ -
CSS IVR			$ 87		$ 87	No	$ -	$ -	$ -
Customer Accounting System (CAS)			$ 20		$ 20	No	$ -	$ -	$ -
Customer Insights and Analysis (CIAP)				$ 22	$ 22	No	$ -	$ -	$ -
Customer Relations Information System (CRIS III)				$ 3,172	$ 3,172	No	$ -	$ -	$ -
CUTCAP		$ 3			$ 3	No	$ 3	$ -	$ 3
CWQ		$ 152			$ 152	Replace	$ 152	$ -	$ 152
Damage Tracking System (DTS)		$ 22			$ 22	No	$ 22	$ -	$ 22
Demand Side Management	$ 3				$ 3	No	$ -	$ 1	$ 1
DIGSAFE-NE		$ 49			$ 49	No	$ 49	$ -	$ 49
DIS		$ 9			$ 9	Replace	$ 9	$ -	$ 9
DIPMS		$ 2			$ 2	Replace	$ 2	$ -	$ 2
DSM (Demand Side Management)	$ 312				$ 312	No	$ -	$ 147	$ 147
DTS		$ 8			$ 8	No	$ 8	$ -	$ 8
EBB Database		$ 70			$ 70	No	$ 70	$ -	$ 70
ECONOMIC INCENTIVE R				$ 9	$ 9	No	$ -	$ -	$ -
Economic Incentive Rates (cris iii)				$ 7	$ 7	Future State	$ -	$ -	$ -
EDI (cris iii)				$ 79	$ 79	No	$ -	$ -	$ -
EDI (cris iii)				$ 25	$ 25	No	$ -	$ -	$ -
EJ WARD	$ 11				$ 11	No	$ -	$ 5	$ 5
Electronic Bulletin Board (EBB)		$ 2			$ 2	No	$ 2	$ -	$ 2
Endpoint Processing System (EPS)	$ 4				$ 4	No	$ -	$ 2	$ 2
Energy Resource System (ERS)	$ 12				$ 12	No	$ -	$ 6	$ 6
E-Permits		$ 45			$ 45	Future State	$ 45	$ -	$ 45
EPO	$ 21				$ 21	No	$ -	$ 10	$ 10
EPO Real Time Transfer	$ 7				$ 7	No	$ -	$ 3	$ 3
ERS	$ 36				$ 36	No	$ -	$ 17	$ 17
FSRI	$ 878				$ 878	Future State	$ -	$ 413	$ 413
FSRI (GIS) (US)	$ 28				$ 28	Future State	$ -	$ 13	$ 13
Feeder Hardening	$ 4				$ 4	Replace	$ -	$ 2	$ 2
FeedPro/SupplyPro/Feeder-Health	$ 3				$ 3	No	$ -	$ 1	$ 1
Field Collection System (FCS)	$ 78				$ 78	Replace	$ -	$ 37	$ 37
FIS		$ 3			$ 3	No	$ 3	$ -	$ 3
FIS SERVER SUPPORT		$ 8			$ 8	No	$ 8	$ -	$ 8
Fluke Met Team/Cal	$ 52				$ 52	No	$ -	$ 24	$ 24
FME	$ 12				$ 12	No	$ -	$ 6	$ 6
FORTIS-NE		$ 37			$ 37	Replace	$ 37	$ -	$ 37
FSD		$ 56			$ 56	No	$ 56	$ -	$ 56
Gas Leak Tracking		$ 10			$ 10	Replace	$ 10	$ -	$ 10
Gas Pricing		$ 3			$ 3	No	$ 3	$ -	$ 3
GAS RECORDERS		$ 19			$ 19	No	$ 19	$ -	$ 19
Gas Sales Proposals (GSP)		$ 5			$ 5	No	$ 5	$ -	$ 5
Gas T Beedings Entry System		$ 2			$ 2	No	$ 2	$ -	$ 2
Gas Transportation Information System (GTIS)		$ 73			$ 73	No	$ 73	$ -	$ 73
GasCar		$ 4			$ 4	No	$ 4	$ -	$ 4
GASCAR SA		$ 9			$ 9	No	$ 9	$ -	$ 9
GASWEB WEB SERVER		$ 4			$ 4	No	$ 4	$ -	$ 4
GIS Aerial Images	$ 1				$ 1	No	$ -	$ 0	$ 0
GIS Application Suite	$ 444				$ 444	Replace	$ -	$ 209	$ 209
Government Construction System-NE		$ 5			$ 5	No	$ 5	$ -	$ 5
Gstn		$ 2			$ 2	No	$ 2	$ -	$ 2
GSA				$ 13	$ 13	No	$ -	$ -	$ -
GTIS		$ 90			$ 90	No	$ 90	$ -	$ 90
ID Reporting System		$ 1			$ 1	No	$ 1	$ -	$ 1
Ischeduler	$ 629				$ 629	Retired	$ -	$ 296	$ 296
IVR (CSS)			$ 348		$ 348	No	$ -	$ -	$ -
IVR Web Services Support			$ 15		$ 15	No	$ -	$ -	$ -
Java CAPS	$ 77				$ 77	Replace	$ -	$ 36	$ 36
JCAPS - LIS - MWORK	$ 105				$ 105	Replace	$ -	$ 49	$ 49
Joint Pole Proposal	$ 4				$ 4	No	$ -	$ 2	$ 2
JPP/EDI Tracking System	$ 5				$ 5	No	$ -	$ 2	$ 2
Leak Management Systems (LMS-LI)		$ 7			$ 7	Replace	$ 7	$ -	$ 7
Leak Management Systems (LMS-NYC)		$ 7			$ 7	Replace	$ 7	$ -	$ 7
Leak Management Systems-NE		$ 16			$ 16	Replace	$ 16	$ -	$ 16
Leak Survey		$ 5			$ 5	Replace	$ 5	$ -	$ 5
LNG Plant Maintenance		$ 1			$ 1	No	$ 1	$ -	$ 1
Mandatory Hourly Pricing	$ 1				$ 1	No	$ -	$ 0	$ 0
MAPFRAME	$ 110				$ 110	Replace	$ -	$ 52	$ 52
MAPS	$ 45				$ 45	No	$ -	$ 21	$ 21
MAPVIEW	$ 10				$ 10	No	$ -	$ 5	$ 5
Mapview	$ 2				$ 2	No	$ -	$ 1	$ 1
MAXIMO		$ 4			$ 4	Replace	$ 4	$ -	$ 4
MAXIMO/SAP INTERFACE		$ 7			$ 7	Replace	$ 7	$ -	$ 7
MAXIMO-T&D		$ 52			$ 52	Replace	$ 52	$ -	$ 52
MDS Web	$ 28				$ 28	No	$ -	$ 13	$ 13
MDSI (Core)		$ 2			$ 2	Replace	$ 2	$ -	$ 2
MDSI GAS		$ 6			$ 6	Replace	$ 6	$ -	$ 6
MDSI-Gas (NY)		$ 763			$ 763	Replace	$ 763	$ -	$ 763
MDSI-NE (GAS)		$ 52			$ 52	Replace	$ 52	$ -	$ 52
Meter Inventory Tracking System	$ 32				$ 32	Replace	$ -	$ 15	$ 15
Meter Statistics-NE	$ 5				$ 5	Replace	$ -	$ 2	$ 2
Metretek AMR 2009	$ 6				$ 6	No	$ -	$ 3	$ 3
Metretek- NY (KeyScan)	$ 14				$ 14	No	$ -	$ 7	$ 7
Microstation / Virtual Print Room	$ 2				$ 2	Replace	$ -	$ 1	$ 1
Mobile Materials Assistant (MMA)		$ 22			$ 22	No	$ 22	$ -	$ 22
MVIS	$ 4				$ 4	Replace	$ -	$ 2	$ 2
MVI0 - RI	$ 9				$ 9	Replace	$ -	$ 4	$ 4
MVIS		$ 9			$ 9	No	$ 9	$ -	$ 9
MWORK (FFE)	$ 189				$ 189	Replace	$ -	$ 89	$ 89
Myquotes		$ 22			$ 22	Retired	$ 22	$ -	$ 22
Nerc-CIP Automation	$ 3				$ 3	No	$ -	$ 1	$ 1
NETMOTION		$ 75			$ 75	No	$ 75	$ -	$ 75
NUCLEUS (RMS)		$ 27			$ 27	No	$ 27	$ -	$ 27
NYISO	$ 3				$ 3	No	$ -	$ 1	$ 1
ONYX (CONE)		$ 8			$ 8	No	$ 8	$ -	$ 8
Oracle Messaging Gateway support	$ 8				$ 8	No	$ -	$ 4	$ 4
OSISoft Process Information (PI) (NE)		$ 23			$ 23	No	$ 23	$ -	$ 23
PE ANALYTICS	$ 23				$ 23	Future State	$ -	$ 11	$ 11
Paving (NYC)		$ 12			$ 12	Replace	$ 12	$ -	$ 12
Paving DB, Pave Seed, Restoration DB		$ 3			$ 3	Replace	$ 3	$ -	$ 3
Permits	$ 2				$ 3	Replace	$ -	$ 1	$ 1
Phasor	$ 19				$ 19	No	$ -	$ 9	$ 9
Phasor Measurement Unit (PMU) (NY/NE)	$ 11				$ 11	No	$ -	$ 5	$ 5
Pipeline Compliance System (PCS)		$ 28			$ 28	Future State	$ 28	$ -	$ 28
Planned Outage	$ 3				$ 3	No	$ -	$ 1	$ 1
Power Quality	$ 2				$ 2	No	$ -	$ 1	$ 1
PowerPlan	$ 425				$ 425	Future State	$ -	$ 200	$ 200
PRM		$ 1			$ 1	No	$ 1	$ -	$ 1
Regulators		$ 3			$ 3	No	$ 3	$ -	$ 3
Resource on Demand (RODs)	$ 1				$ 1	Replace	$ -	$ 0	$ 0
RI TSA (Transportation Services Application – Rhode Island)				$ 62	$ 62	No	$ -	$ -	$ -
RMVRT Route Manager VRT		$ 18			$ 18	No	$ 18	$ -	$ 18
SALES INVESTIGATION		$ 7			$ 7	No	$ 7	$ -	$ 7
SCD TRANSMISSION		$ 16			$ 16	No	$ 16	$ -	$ 16
Service Pipe System-NE		$ 8			$ 8	No	$ 8	$ -	$ 8
SMALL WORLD	$ 51				$ 51	Replace	$ -	$ 24	$ 24
SNAP		$ 1			$ 1	No	$ 1	$ -	$ 1
SOP (Gas Control)		$ 65			$ 65	Future State	$ 65	$ -	$ 65
STORM Archive tool	$ 10				$ 10	Replace	$ -	$ 5	$ 5
Storm Damage Assessment (SDA)	$ 27				$ 27	No	$ -	$ 13	$ 13
STORMS	$ 103				$ 103	Replace	$ -	$ 48	$ 48
SynerGEE Gas		$ 4			$ 4	Replace	$ 4	$ -	$ 4
The World				$ 2	$ 2	No	$ -	$ -	$ -
Transmission Service Agreements / Transmission Service Contracts (TSA/TSC)	$ 4				$ 4	No	$ -	$ 2	$ 2
Transportation Services Application (TSA) (RI)				$ 20	$ 20	No	$ -	$ -	$ -
Transportation System - Electronic Bulletin Board (EBB) (Gas)		$ 32			$ 32	No	$ 32	$ -	$ 32
TSA				$ 52	$ 52	No	$ -	$ -	$ -
UGBPS	$ 7				$ 7	No	$ -	$ 3	$ 3
Underground facility applications (to Digsafe, Digsafely locating)		$ 2			$ 2	No	$ 2	$ -	$ 2
US Retail Web			$ 22		$ 22	No	$ -	$ -	$ -
US Retail Web - DBA			$ 18		$ 18	No	$ -	$ -	$ -
US Retail Web - Your Account			$ 267		$ 267	No	$ -	$ -	$ -
US Retail Web - Your Account App Server			$ 35		$ 35	No	$ -	$ -	$ -
Vantage IM		$ 9			$ 9	No	$ 9	$ -	$ 9
WardFuel System (EJ Ward NGUS)	$ 8				$ 8	No	$ -	$ 4	$ 4
WEB BASED SIR SOLUTION	$ 9				$ 9	No	$ -	$ 4	$ 4
Web Based SIR Solution - External Customer	$ 1				$ 1	No	$ -	$ 0	$ 0
Web Based SIR Solution - Internal Business	$ 1				$ 1	No	$ -	$ 0	$ 0
Wholesale Settlement Application	$ 14				$ 14	No	$ -	$ 7	$ 7
WINFILER	$ 4				$ 4	No	$ -	$ 2	$ 2
ZEMA		$ 8			$ 8	No	$ 8	$ -	$ 8

Row Labels	Sum of Gas Application Cost Only	Sum of Shared Application Cost - Gas	Sum of Total
Future State	339	646.25	985.25
Replace	1265	1154.79	2419.79
Grand Total	**1604**	**1801.04**	**3405.04**

Baseline - Current RTB Costs (projection based on past data)

	FY18	FY19	FY20	FY21	FY22	FY23	SOURCE	Tab	Annual
Baseline - Current RTB Costs (projection based on past data)	$ 3,575,040	$ 3,937,137	$ 4,647,841	$ 5,105,040	$ 5,105,040	$ 5,105,040			

Estimated Legacy Application Support (Future State Increase)	FY18	FY19	FY20	FY21	FY22	FY23
Schedule Estimate	70%	77%	91%	100%	100%	100%
Estimated Legacy Application Support (Future State)	$ 3,575,040	$ 3,937,137	$ 4,647,841	$ 5,105,040	$ 5,105,040	$ 5,105,040

In GIOP-11

Baseline RTB Cost	$ 3,405,040
Baseline Mobile Device Support	$ 1,700,000
Total Baseline RTB Costs	$ 5,105,040

Allocations of Actuals
Fully Loaded Allocation of Actuals for 2861 field worker devices (including network cost, mounting costs etc.)
47%

Application Gas Process (5000,s)	Electric/Gas	Gas	Meter to Cash Elect & Gas	Meter to Cash, Gas	Grand Total	GBE Replacement (Target)	Gas Application Cost Only	Shared Application Cost - Gas Portion - 47%	Total
(AVAYA) INTERACTIVE				$ 116	$ 116	No	$ -	$ -	$ -
(Avaya) Interactive Voice Response			$ 22		$ 22	No	$ -	$ -	$ -
Agent Desktop				$ 254	$ 254	Replace	$ -	$ -	$ -
AIMMS	$ 32				$ 32	No	$ -	$ 15	$ 15
ALLEGRO		$ 465			$ 465	No	$ 465	$ -	$ 465
ArcFM Viewer		$ 59			$ 59	Replace	$ 59	$ -	$ 59
ARCFM/GIS-NE		$ 201			$ 201	Future State	$ 201	$ -	$ 201
ARCOS	$ 6				$ 6	Future State	$ -	$ 3	$ 3
Automated Roster Call Out System (ARCOS)	$ 15				$ 15	Future State	$ -	$ 7	$ 7
AVLS	$ 476				$ 476	Replace	$ -	$ 224	$ 224
Bentley Redline	$ 119				$ 119	No	$ -	$ 56	$ 56
CAD / CAE Systems	$ 12				$ 12	No	$ -	$ 6	$ 6
CAD/CAE	$ 104				$ 104	No	$ -	$ 49	$ 49
CADHIST	$ 35				$ 35	Replace	$ -	$ 16	$ 16
Cascade (Gas)		$ 30			$ 30	Replace	$ 30	$ -	$ 30
Cash Receipts Data Entry Manager (cris iii)				$ 5	$ 5	Future State	$ -	$ -	$ -
Checkmeter	$ 22				$ 22	No	$ -	$ 10	$ 10
CITRIX	$ 6				$ 6	No	$ -	$ 3	$ 3
CITRIX - FCS	$ 5				$ 5	Replace	$ -	$ 2	$ 2
Combustible Gas Indicator Test (CGI) (pcad) (pragmaCAD)		$ 17			$ 17	No	$ 17	$ -	$ 17
Company Managed Contract Services-NE		$ 8		$ 3	$ 11	No	$ 8	$ -	$ 8
Contractor Charges (CCH)	$ 43				$ 43	Replace	$ -	$ 20	$ 20
Corridor Manager/Smallworld	$ 42				$ 42	Replace	$ -	$ 20	$ 20
CORROSION CONTROL WO		$ 4			$ 4	Replace	$ 4	$ -	$ 4
CSC US INFRA CITRIX		$ 5			$ 5	No	$ 5	$ -	$ 5
CSS			$ 11,759		$ 11,759	No	$ -	$ -	$ -
CSS IVR			$ 87		$ 87	No	$ -	$ -	$ -
Customer Accounting System (CAS)			$ 20		$ 20	No	$ -	$ -	$ -
Customer Insights and Analysis (CIAP)				$ 22	$ 22	No	$ -	$ -	$ -
Customer Relations Information System (CRIS III)				$ 3,172	$ 3,172	No	$ -	$ -	$ -
CUTCAP		$ 3			$ 3	No	$ 3	$ -	$ 3
CWG		$ 152			$ 152	Replace	$ 152	$ -	$ 152
Damage Tracking System (DTS)		$ 22			$ 22	No	$ 22	$ -	$ 22
Demand Side Management	$ 3				$ 3	No	$ -	$ 1	$ 1
DIGSAFE-NE		$ 49			$ 49	No	$ 49	$ -	$ 49
DIS		$ 9			$ 9	Replace	$ 9	$ -	$ 9
DIPMS		$ 2			$ 2	Replace	$ 2	$ -	$ 2
DSM (Demand Side Management)	$ 312				$ 312	No	$ -	$ 147	$ 147
DTS		$ 8			$ 8	No	$ 8	$ -	$ 8
EBB Database		$ 70			$ 70	No	$ 70	$ -	$ 70
ECONOMIC INCENTIVE R				$ 9	$ 9	No	$ -	$ -	$ -
Economic Incentive Rates (cris iii)				$ 2	$ 2	Future State	$ -	$ -	$ -
EDI (cris iii)				$ 79	$ 79	No	$ -	$ -	$ -
EDI (cris iii)				$ 25	$ 25	No	$ -	$ -	$ -
EJ WARD	$ 11				$ 11	No	$ -	$ 5	$ 5
Electronic Bulletin Board (EBB)		$ 2			$ 2	No	$ 2	$ -	$ 2
Endpoint Processing System (EPS)	$ 4				$ 4	No	$ -	$ 2	$ 2
Energy Resource System (ERS)	$ 12				$ 12	No	$ -	$ 6	$ 6
E-Permits		$ 45			$ 45	Future State	$ 45	$ -	$ 45
EPO	$ 21				$ 21	No	$ -	$ 10	$ 10
EPO Real Time Transfer	$ 7				$ 7	No	$ -	$ 3	$ 3
ERS	$ 36				$ 36	No	$ -	$ 17	$ 17
FSRI	$ 878				$ 878	Future State	$ -	$ 413	$ 413
FSRI (GIS) (US)	$ 28				$ 28	Future State	$ -	$ 13	$ 13
Feeder Hardening	$ 4				$ 4	Replace	$ -	$ 2	$ 2
FeedPro/SupplyPro/Feeder-Health	$ 3				$ 3	No	$ -	$ 1	$ 1
Field Collection System (FCS)	$ 78				$ 78	Replace	$ -	$ 37	$ 37
FIS		$ 3			$ 3	No	$ 3	$ -	$ 3
FIS SERVER SUPPORT		$ 8			$ 8	No	$ 8	$ -	$ 8
Fluke Met Team/Cal	$ 52				$ 52	No	$ -	$ 24	$ 24
FME	$ 12				$ 12	No	$ -	$ 6	$ 6
FORTIS-NE		$ 37			$ 37	Replace	$ 37	$ -	$ 37
FSD		$ 56			$ 56	No	$ 56	$ -	$ 56
Gas Leak Tracking		$ 10			$ 10	Replace	$ 10	$ -	$ 10
Gas Pricing		$ 3			$ 3	No	$ 3	$ -	$ 3
GAS RECORDERS		$ 19			$ 19	No	$ 19	$ -	$ 19
Gas Sales Proposals (GSP)		$ 5			$ 5	No	$ 5	$ -	$ 5
Gas T Readings Entry System		$ 2			$ 2	No	$ 2	$ -	$ 2
Gas Transportation Information System (GTIS)		$ 73			$ 73	No	$ 73	$ -	$ 73
GasCar		$ 4			$ 4	No	$ 4	$ -	$ 4
GASCAR SA		$ 9			$ 9	No	$ 9	$ -	$ 9
GASWEB WEB SERVER		$ 4			$ 4	No	$ 4	$ -	$ 4
GIS Aerial Images	$ 1				$ 1	No	$ -	$ 0	$ 0
GIS Application Suite	$ 444				$ 444	Replace	$ -	$ 209	$ 209
Government Construction System-NE		$ 5			$ 5	No	$ 5	$ -	$ 5
Grin		$ 2			$ 2	No	$ 2	$ -	$ 2
GSA				$ 13	$ 13	No	$ -	$ -	$ -
GTIS		$ 90			$ 90	No	$ 90	$ -	$ 90
HD Reporting System		$ 1			$ 1	No	$ 1	$ -	$ 1
Ispheduler	$ 629				$ 629	Replace	$ -	$ 296	$ 296
IVR (CSS)			$ 348		$ 348	No	$ -	$ -	$ -
IVR Web Services Support			$ 15		$ 15	No	$ -	$ -	$ -
Java CAPS	$ 77				$ 77	Replace	$ -	$ 36	$ 36
JCAPS - LIS - MWORK	$ 105				$ 105	Replace	$ -	$ 49	$ 49
Joint Pole Proposal	$ 4				$ 4	No	$ -	$ 2	$ 2
JPP/TION Tracking System	$ 5				$ 5	No	$ -	$ 2	$ 2
Leak Management Systems (LMS-LI)		$ 7			$ 7	Replace	$ 7	$ -	$ 7
Leak Management Systems (LMS-NYC)		$ 7			$ 7	Replace	$ 7	$ -	$ 7
Leak Management Systems-NE		$ 16			$ 16	Replace	$ 16	$ -	$ 16
Leak Survey		$ 5			$ 5	Replace	$ 5	$ -	$ 5
LNG Plant Maintenance		$ 1			$ 1	No	$ 1	$ -	$ 1
Mandatory Hourly Pricing	$ 1				$ 1	No	$ -	$ 0	$ 0
MAPFRAME	$ 110				$ 110	Replace	$ -	$ 52	$ 52
MAPS	$ 45				$ 45	No	$ -	$ 21	$ 21
MAPVIEW	$ 10				$ 10	No	$ -	$ 5	$ 5
Mapview	$ 2				$ 2	No	$ -	$ 1	$ 1
MAXIMO		$ 4			$ 4	Replace	$ 4	$ -	$ 4
MAXIMO/SAP INTERFACE		$ 7			$ 7	Replace	$ 7	$ -	$ 7
MAXIMO-T&D		$ 52			$ 52	Replace	$ 52	$ -	$ 52
MDS Web	$ 28				$ 28	No	$ -	$ 13	$ 13
MDSI (Core)		$ 2			$ 2	Replace	$ 2	$ -	$ 2
MDSI GAS		$ 6			$ 6	Replace	$ 6	$ -	$ 6
MDSI-Gas (NY)		$ 763			$ 763	Replace	$ 763	$ -	$ 763
MDSI-NE (GAS)		$ 52			$ 52	Replace	$ 52	$ -	$ 52
Meter Inventory Tracking System	$ 32				$ 32	Replace	$ -	$ 15	$ 15
Meter Statistics-NE	$ 5				$ 5	Replace	$ -	$ 2	$ 2
Metretek AMR 2009	$ 6				$ 6	No	$ -	$ 3	$ 3
Metretek- NY (KeySpan)	$ 14				$ 14	No	$ -	$ 7	$ 7
Microstation / Virtual Print Room	$ 2				$ 2	Replace	$ -	$ 1	$ 1
Mobile Materials Assistant (MMA)		$ 22			$ 22	No	$ 22	$ -	$ 22
MVI0	$ 4				$ 4	Replace	$ -	$ 2	$ 2
MVI0 - RI	$ 9				$ 9	Replace	$ -	$ 4	$ 4
MVIS		$ 9			$ 9	No	$ 9	$ -	$ 9
MWORK (FFE)	$ 189				$ 189	Replace	$ -	$ 89	$ 89
Myquotes		$ 22			$ 22	Replace	$ 22	$ -	$ 22
Nerc-CIP Automation	$ 3				$ 3	No	$ -	$ 1	$ 1
NETMOTION		$ 75			$ 75	No	$ 75	$ -	$ 75
NUCLEUS (RMS)		$ 27			$ 27	No	$ 27	$ -	$ 27
NYISO	$ 3				$ 3	No	$ -	$ 1	$ 1
ONYX (CORE)		$ 8			$ 8	No	$ 8	$ -	$ 8
Oracle Messaging Gateway support	$ 8				$ 8	No	$ -	$ 4	$ 4
OSISoft Process Information (PI) (NE)		$ 23			$ 23	No	$ 23	$ -	$ 23
PG ANALYTICS	$ 23				$ 23	Future State	$ -	$ 11	$ 11
Paving (NYC)	$ 5	$ 12			$ 12	Replace	$ 12	$ -	$ 12
Paving DB, Pave Seed, Restoration DB		$ 3			$ 3	Replace	$ 3	$ -	$ 3
Permits	$ 3				$ 3	Replace	$ -	$ 1	$ 1
Phasor	$ 19				$ 19	No	$ -	$ 9	$ 9
Phasor Measurement Unit (PMU) (NY/NE)	$ 11				$ 11	No	$ -	$ 5	$ 5
Pipeline Compliance System (PCS)		$ 28			$ 28	Future State	$ 28	$ -	$ 28
Planned Outage	$ 3				$ 3	No	$ -	$ 1	$ 1
Power Quality	$ 2				$ 2	No	$ -	$ 1	$ 1
PowerPlan	$ 425				$ 425	Future State	$ -	$ 200	$ 200
PRM		$ 1			$ 1	No	$ 1	$ -	$ 1
Regulators		$ 3			$ 3	No	$ 3	$ -	$ 3
Resource on Demand (RODs)	$ 1				$ 1	Replace	$ -	$ 0	$ 0
RI TSA (Transportation Services Application – Rhode Island)				$ 62	$ 62	No	$ -	$ -	$ -
RMVRT Route Manager VRT		$ 18			$ 18	No	$ 18	$ -	$ 18
SALES INVESTIGATION		$ 7			$ 7	No	$ 7	$ -	$ 7
SCO TRANSMISSION		$ 16			$ 16	No	$ 16	$ -	$ 16
Service Pipe System-NE		$ 8			$ 8	No	$ 8	$ -	$ 8
SMALL WORLD	$ 51				$ 51	Replace	$ -	$ 24	$ 24
SNAP		$ 1			$ 1	No	$ 1	$ -	$ 1
SOP (Gas Control)		$ 65			$ 65	Future State	$ 65	$ -	$ 65
STORM Archive tool	$ 10				$ 10	Replace	$ -	$ 5	$ 5
Storm Damage Assessment (SDA)	$ 27				$ 27	No	$ -	$ 13	$ 13
STORMS	$ 103				$ 103	Replace	$ -	$ 48	$ 48
SynerGEE Gas		$ 4			$ 4	Replace	$ 4	$ -	$ 4
The World				$ 2	$ 2	No	$ -	$ -	$ -
Transmission Service Agreements / Transmission Service Contracts (TSA/TSC)	$ 4				$ 4	No	$ -	$ 2	$ 2
Transportation Services Application (TSA) (RI)				$ 20	$ 20	No	$ -	$ -	$ -
Transportation System - Electronic Bulletin Board (EBB) (Gas)		$ 32			$ 32	No	$ 32	$ -	$ 32
TSA				$ 52	$ 52	No	$ -	$ -	$ -
UGBPS	$ 7				$ 7	No	$ -	$ 3	$ 3
Underground facility applications (to Digsafe, Digsafely locating)		$ 2			$ 2	No	$ 2	$ -	$ 2
US Retail Web			$ 22		$ 22	No	$ -	$ -	$ -
US Retail Web - DBA			$ 18		$ 18	No	$ -	$ -	$ -
US Retail Web - Your Account			$ 267		$ 267	No	$ -	$ -	$ -
US Retail Web - Your Account App Server			$ 35		$ 35	No	$ -	$ -	$ -
Vantage IM		$ 9			$ 9	No	$ 9	$ -	$ 9
WardFuel System (EJ Ward NGUS)	$ 8				$ 8	No	$ -	$ 4	$ 4
WEB BASED SIR SOLUTION	$ 9				$ 9	No	$ -	$ 4	$ 4
Web Based SIR Solution - External Customer	$ 1				$ 1	No	$ 1	$ 0	$ 0
Web Based SIR Solution - Internal Business	$ 1				$ 1	No	$ -	$ 0	$ 0
Wholesale Settlement Application	$ 14				$ 14	No	$ -	$ 7	$ 7
WINFILER	$ 4				$ 4	No	$ -	$ 2	$ 2
XTMA		$ 8			$ 8	No	$ 8	$ -	$ 8

Row Labels	Sum of Gas Application Cost Only	Sum of Shared Application Cost - Gas Portion - 47%	Sum of Total
Future State	339	646.25	985.25
Replace	1265	1154.79	2419.79
Grand Total	**1604**	**1801.04**	**3405.04**

NMPC Customer Appointment & Commitment Analysis

Scenario 1 - Move all customers appointments/commitments to 4hrs

	2016 job Count (source Resource Management & Dispatch)	Appointment / Commitment Window (hrs)	Hypothetical new Appointment Windows with modern scheduling system	Customer Waiting Time saved per Appointment / Commitment	Total Hours Saved	Cost per Hour* (to the customer)	Total 'Financial Benefit' to customers due to reduced wait times
Appointments Made (Electric & Gas)	30,292	2	4	-2	(60,584)	$ 18.11	$ (1,097,353.30)
Customer Commitments Day (8am-4pm)**	111,419	8	4	4	445,676	$ 18.11	$ 8,072,494.91
Customer Commitments Night (4pm-8pm)**	47,751	4	4	0	-	$ 18.11	$ -
Total	**189,462**				**385,092**	**Total**	**$ 6,975,141.60**

* Bureau of Labor Statistics - Weighted Average of Upstate Counties - May 2016 - See Labor Rate Data Worksheet for Details
** Total customer commitments = 159,170. Assumed 70% day appointments in this analysis

Scenario 2 - Move all customers appointments/commitments to 2hrs

	2016 job Count (source Resource Management & Dispatch)	Appointment / Commitment Window (hrs)	Hypothetical new Appointment Windows with modern scheduling system	Customer Waiting Time saved per Appointment / Commitment	Total Hours Saved	Cost per Hour* (to the customer)	Total 'Financial Benefit' to customers due to reduced wait times
Appointments Made (Electric & Gas)	30,292	2	2	0	-	$ 18.11	$ -
Customer Commitments Day (8am-4pm)**	111,419	8	2	6	668,514	$ 18.11	$ 12,108,742.36
Customer Commitments Night (4pm-8pm)**	47,751	4	2	2	95,502	$ 18.11	$ 1,729,820.34
Total	**189,462**				**764,016**	**Total**	**$ 13,838,562.70**

* Bureau of Labor Statistics - Weighted Average of Upstate Counties - May 2016 - See Labor Rate Data Worksheet for Details
** Total customer commitments = 159,170. Assumed 70% day appointments in this analysis

Burea of Labor Statistics - Simple Mean of All Counties May - 2016					
AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37
Dutchess County-Putnam County, NY Metropolitan Division	00-0000	All Occupations	total	139,060	$ 19.32
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20
Nassau County-Suffolk County, NY Metropolitan Division	00-0000	All Occupations	total	1,286,290	$ 20.31
New York-Jersey City-White Plains, NY-NJ Metropolitan Division	00-0000	All Occupations	total	6,586,480	$ 22.13
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23
TOTAL				10,276,260	$ 18.34

Burea of Labor Statistics - Weighted Average of All Counties- May 2016						
AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE	WEIGHT_FACTOR
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83	8774929.049
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19	1647969.921
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37	9529474.538
Dutchess County-Putnam County, NY Metropolitan Division	00-0000	All Occupations	total	139,060	$ 19.32	2686625.294
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25	622031.394
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58	854030.649
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13	1068961.641
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20	1009634.13
Nassau County-Suffolk County, NY Metropolitan Division	00-0000	All Occupations	total	1,286,290	$ 20.31	26124549.9
New York-Jersey City-White Plains, NY-NJ Metropolitan Division	00-0000	All Occupations	total	6,586,480	$ 22.13	145759461
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27	9355935.509
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13	5470213.772
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83	2013553.164
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23	668680.12
				10,276,260	$ 20.98	$ 20.98

United States Census Bureau in Past 12 Months (in 2015 dollars), 2011 - 2015		
Per Capita Income in Past 12 Months (in 2015 dollars), 2011 - 2015, Yealy Salary	$	33,236.00
Per Capita Income in Past 12 Months (in 2015 dollars), 2011 - 2015, Per Hour Salary	$	15.98

Burea of Labor Statistics - Simple Mean of Upstate Counties - May 2016					
AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23
TOTAL				2,264,430	$ 17.73

Burea of Labor Statistics - Weighted Average of Upstate Counties - May 2016						
AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE	WEIGHT_FACTOR
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83	8774973.3
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19	1647980.1
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37	9529529.4
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25	622035
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58	854035.8
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13	1068966.7
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20	1009640
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27	9355884.3
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13	5470183.6
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83	2013541.2
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23	668676
TOTAL				2,264,430	$ 18.11	$ 18.11

Entity	Link
US Census Bureau	https://www.census.gov/quickfacts/fact/map/NY/INC910215#viewtop
Bureau Of Labor Statistics	https://www.bls.gov/oes/current/oes_ny.htm
Bureau Of Labor Statistics	https://www.bls.gov/oes/current/oes_3600001.htm
Bureau Of Labor Statistics	https://www.bls.gov/oes/current/msa_def.htm#3600001

UNY Elec CY16 Meter Changes													
Category	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**CY16 Total**
Meter Change - Capita	1,684	1,717	1,823	2,147	1,429	1,344	1,083	1,359	1,497	1,721	1,346	1,485	**18,635**
Meter Change - O&M	58	15	12	21	6	13	8	9	16	31	18	20	**227**
Total UNY Elec	**1,742**	**1,732**	**1,835**	**2,168**	**1,435**	**1,357**	**1,091**	**1,368**	**1,513**	**1,752**	**1,364**	**1,505**	**18,862**

UNY Gas CY16 Meter Changes													
Category	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**CY16 Total**
Meter Change - Capita	1,516	1,670	1,484	2,037	2,000	1,153	686	1,506	1,120	1,105	1,246	1,204	**16,727**
Meter Change - O&M	138	99	186	253	221	198	145	178	154	217	204	244	**2,237**
Total UNY Gas	**1,654**	**1,769**	**1,670**	**2,290**	**2,221**	**1,351**	**831**	**1,684**	**1,274**	**1,322**	**1,450**	**1,448**	**18,964**

UNY CY16 Meter Changes													
Category	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**CY16 Total**
Meter Change - Capita	3,200	3,387	3,307	4,184	3,429	2,497	1,769	2,865	2,617	2,826	2,592	2,689	**35,362**
Meter Change - O&M	196	114	198	274	227	211	153	187	170	248	222	264	**2,464**
Total UNY Gas	**3,396**	**3,501**	**3,505**	**4,458**	**3,656**	**2,708**	**1,922**	**3,052**	**2,787**	**3,074**	**2,814**	**2,953**	**37,826**

Appointments - 2016														
INDICATOR	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**YTD Total**	**YTD Avg**
Appointments made	2,083	2,203	2,332	2,721	2,699	2,738	2,115	2,964	2,673	2,908	2,671	2,185	**30,292**	**2,524**
Appointments kept	2,068	2,174	2,292	2,698	2,674	2,717	2,095	2,936	2,647	2,869	2,629	2,149	29,948	**2,496**
Appt kept $	99%	99%	98%	99%	99%	99%	99%	99%	99%	99%	98%	98%	99%	99%

Month Name	Year	Appointment Renegotiated	Count - Other Orders Completed	Count - Other Orders UTC	Count - Elec and Gas WrkOrders	Count - Electric Orders Completed	Count - Electric Orders UTC	Count - Gas Orders Completed	Count - Gas Orders UTC	# Early Appointments	# Late Appointments	# On Time Appointments	# Total Appointments
JAN	2016	N	38	9	641	345	89	726	143	5	8	1978	1991
JAN	2016	Y	0	0	21	21	1	49	0	0	2	90	92
FEB	2016	N	44	3	686	428	89	758	110	6	21	2091	2118
FEB	2016	Y	1	0	24	18	0	40	2	0	2	83	85
MAR	2016	N	82	9	711	449	98	754	133	14	25	2197	2236
MAR	2016	Y	4	0	32	25	2	33	0	1	0	95	96
APR	2016	N	48	4	861	462	78	1,055	130	12	11	2615	2638
APR	2016	Y	2	0	26	22	0	32	1	0	0	83	83
MAY	2016	N	46	0	998	453	82	893	117	5	19	2565	2589
MAY	2016	Y	1	0	40	21	2	41	4	0	1	108	109
JUN	2016	N	69	8	1,113	513	81	748	107	6	14	2619	2639
JUN	2016	Y	3	0	48	20	4	23	1	0	1	98	99
JUL	2016	N	39	3	1,007	439	74	409	71	8	11	2023	2042
JUL	2016	Y	2	0	26	16	4	23	2	1	0	72	73
AUG	2016	N	50	4	1,238	559	91	796	143	8	19	2854	2881
AUG	2016	Y	0	0	37	15	1	30	0	1	0	82	83
SEP	2016	N	47	2	1,091	508	97	721	122	7	19	2562	2588
SEP	2016	Y	1	0	36	16	1	31	0	0	0	85	85
OCT	2016	N	55	3	1,032	497	100	976	139	8	31	2763	2802
OCT	2016	Y	0	1	32	21	3	46	2	0	0	105	105
NOV	2016	N	68	5	952	487	107	807	149	9	31	2535	2575
NOV	2016	Y	1	0	27	27	3	35	3	0	2	94	96
DEC	2016	N	52	4	760	434	101	623	113	15	22	2050	2087
DEC	2016	Y	2	0	28	15	3	46	6	0	1	99	100
2016			**655**	**55**	**11,467**	**5,811**	**1,111**	**9,695**	**1,498**			**29,946**	**30,292**
TOTALS			**Total Other =**	**710**		**Total Elec =**	**6,922**	**Total Gas =**	**11,193**				

Date of Request: July 21, 2017 Request No. DPS-658 AT-12
Due Date: July 31, 2017 NMPC Req. No. NM-1322

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure & Operations Panel

SUBJECT: **CUSTOMER BENEFITS**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

Exhibit__(GIOP-12) lists the benefits from implementing Gas Business Enablement (GBE) for both National Grid and Niagara Mohawk. For Niagara Mohawk, does GBE provide any customer benefits that do not impact the Company's revenue requirement? If so, describe each benefit, indicate why it occurs, and explain how it will impact customers. Quantify benefits where possible.

Response:

Yes, the Gas Business Enablement (GBE) Program will deliver a number of benefits to customers that do not impact the Company's revenue requirement. These benefits include:

- Enhanced Customer Information. Increased information available to customers from the Company's call center representatives who will have more information on field activities, such as the status of customer-driven work requests or the locations of field crews. Examples of the enabling initiatives for this benefit include the Employee Support Interaction (first and second release), Customer Relationship Management (CRM)/Contact Center, and Large Commercial & Landlord Interaction initiatives described in Exhibit __ (GIOP-9);

- Self-Serve Information. Customers will have the ability to access more information without the need to call the call centers through self-service routes, which enable quick and convenient provision of information. The Company**'s** website and customer applications will provide this enhanced functionality. Please see capabilities for Customer Interaction (first and second release), Customer Relationship Management (CRM) / Contact Center, and Large Commercial & Landlord Interaction initiatives detailed in Exhibit __ (GIOP-9);
- Appointment Booking. An enhanced ability to book appointments for work, as appointment availability will be linked directly to resource capacity and a scheduling engine compared to the manual process today. Please see capabilities for Customer Interaction (first and second release), Employee Support Interaction, Customer Relationship Management (CRM) / Contact Center, Large Commercial & Landlord Interaction initiatives detailed in Exhibit __ (GIOP-9);
- Appointment Management. The flexibility to manage appointments either through the call center or directly through self-service channels. Because the appointments will be linked to actual availability, it will be much easier to re-schedule appointments in real-time. Please see capabilities for Customer Interaction (first and second release), CxT Portal & Channel Management, Employee Support Interaction and Customer Relationship Management (CRM) / Contact Center initiatives detailed in Exhibit __ (GIOP-9);
- Customer Notifications. Improved customer notifications from National Grid on work that is being completed, including providing the name(s) of the technician(s) performing the work. These notifications will keep customers informed of the status of work, particularly when there is an unforeseen delay, and will also provide them with enhanced security as they will know who to expect from National Grid. Please see capabilities for Customer Interaction (first & second release), CxT Portal & Channel Management, Large Commercial & Landlord Interaction, and Customer Relationship Management (CRM) / Contact Center initiatives detailed in Exhibit __ (GIOP-9); and
- Appointment Windows. Potential for more appointment windows and reduced timeframe for current 4 and 8 hour customer commitment windows through the enhanced scheduling platform. Please see capabilities for Company Driven Work: Collections and non-Appointment Offs – Gas/Electric and Customer, Leak Investigation & Inspections – Gas/Electric; Customer, Leak Investigation & Inspections – Electric) initiatives detailed in Exhibit __ (GIOP-9).

These incremental services will provide significant value for customers in the form of enhanced customer service. It is difficult to quantify the value of these benefits to customers. However, as described below, the GBE Program team has estimated that providing smaller appointment windows for Niagara Mohawk customers could be worth $7-$14M a year to them in time savings.

The estimated customer benefits are based on weighted average hourly wages ($18.11) for the counties in Upstate New York from the U.S. Bureau of Labor Statistics (2016). The analysis is based upon the number of annual electric and gas appointments/commitments for 2016:

- Appointments Made (Electric & Gas) – 30,292
- Customer Commitments Day (8am – 4pm) – 111,419
- Customer Commitments Night (4pm – 8pm) – 47,751

The analysis highlights a customer savings of approximately $7M by adjusting the customer appointment/commitment window from 8 hours to 4 hours and approximately $14M by reducing the customer appointment/commitment window from 8 hours to 2 hours. Please refer to Attachment 1 highlighting the analysis and assumptions used to calculate the customer savings.

Name of Respondent:	Date of Reply:
Johnny Johnston	July 31, 2017

NMPC Customer Appointment & Commitment Analysis

Scenario 1 - Move all customers appointments/commitments to 4hrs

	2016 job Count (source Resource Management & Dispatch)	Appointment / Commitment Window (hrs)	Hypothetical new Appointment Windows with modern scheduling system	Customer Waiting Time saved per Appointment / Commitment	Total Hours Saved	Cost per Hour* (to the customer)	Total 'Financial Benefit' to customers due to reduced wait times
Appointments Made (Electric & Gas)	30,292	2	4	-2	(60,584)	$ 18.11	$ (1,097,353.30)
Customer Commitments Day (8am-4pm)**	111,419	8	4	4	445,676	$ 18.11	$ 8,072,494.91
Customer Commitments Night (4pm-8pm)**	47,751	4	4	0	-	$ 18.11	$ -
Total	**189,462**				**385,092**	**Total**	**$ 6,975,141.60**

* Bureau of Labor Statistics - Weighted Average of Upstate Counties - May 2016 - See Labor Rate Data Worksheet for Details

** Total customer commitments = 159,170. Assumed 70% day appointments in this analysis

Scenario 2 - Move all customers appointments/commitments to 2hrs

	2016 job Count (source Resource Management & Dispatch)	Appointment / Commitment Window (hrs)	Hypothetical new Appointment Windows with modern scheduling system	Customer Waiting Time saved per Appointment / Commitment	Total Hours Saved	Cost per Hour* (to the customer)	Total 'Financial Benefit' to customers due to reduced wait times
Appointments Made (Electric & Gas)	30,292	2	2	0	-	$ 18.11	$ -
Customer Commitments Day (8am-4pm)**	111,419	8	2	6	668,514	$ 18.11	$ 12,108,742.36
Customer Commitments Night (4pm-8pm)**	47,751	4	2	2	95,502	$ 18.11	$ 1,729,820.34
Total	**189,462**				**764,016**	**Total**	**$ 13,838,562.70**

* Bureau of Labor Statistics - Weighted Average of Upstate Counties - May 2016 - See Labor Rate Data Worksheet for Details

** Total customer commitments = 159,170. Assumed 70% day appointments in this analysis

Burea of Labor Statistics - Simple Mean of All Counties May - 2016

AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37
Dutchess County-Putnam County, NY Metropolitan Division	00-0000	All Occupations	total	139,060	$ 19.32
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20
Nassau County-Suffolk County, NY Metropolitan Division	00-0000	All Occupations	total	1,286,290	$ 20.31
New York-Jersey City-White Plains, NY-NJ Metropolitan Division	00-0000	All Occupations	total	6,586,480	$ 22.13
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23
TOTAL				10,276,260	$ 18.34

Burea of Labor Statistics - Simple Mean of Upstate Counties - May 2016

AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23
TOTAL				2,264,430	$ 17.73

Burea of Labor Statistics - Weighted Average of All Counties- May 2016

AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE	WEIGHT_FACTOR
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83	8774929.049
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19	1647969.921
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37	9529474.538
Dutchess County-Putnam County, NY Metropolitan Division	00-0000	All Occupations	total	139,060	$ 19.32	2686625.294
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25	622031.394
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58	854030.649
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13	1068961.641
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20	1009634.13
Nassau County-Suffolk County, NY Metropolitan Division	00-0000	All Occupations	total	1,286,290	$ 20.31	26124549.9
New York-Jersey City-White Plains, NY-NJ Metropolitan Division	00-0000	All Occupations	total	6,586,480	$ 22.13	145759461
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27	9355935.509
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13	5470213.772
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83	2013553.164
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23	668680.12
				10,276,260	$ 20.98	$ 20.98

Burea of Labor Statistics - Weighted Average of Upstate Counties - May 2016

AREA_NAME	OCC_CODE	OCC_TITLE	OCC_GROUP	TOTAL_EMPLOYMENT	HOURLY_MEDIAN_WAGE	WEIGHT_FACTOR
Albany-Schenectady-Troy, NY	00-0000	All Occupations	total	442,510	$ 19.83	8774973.3
Binghamton, NY	00-0000	All Occupations	total	101,790	$ 16.19	1647980.1
Buffalo-Cheektowaga-Niagara Falls, NY	00-0000	All Occupations	total	548,620	$ 17.37	9529529.4
Elmira, NY	00-0000	All Occupations	total	36,060	$ 17.25	622035
Glens Falls, NY	00-0000	All Occupations	total	51,510	$ 16.58	854035.8
Ithaca, NY	00-0000	All Occupations	total	50,590	$ 21.13	1068966.7
Kingston, NY	00-0000	All Occupations	total	58,700	$ 17.20	1009640
Rochester, NY	00-0000	All Occupations	total	512,090	$ 18.27	9355884.3
Syracuse, NY	00-0000	All Occupations	total	301,720	$ 18.13	5470183.6
Utica-Rome, NY	00-0000	All Occupations	total	119,640	$ 16.83	2013541.2
Watertown-Fort Drum, NY	00-0000	All Occupations	total	41,200	$ 16.23	668676
TOTAL				2,264,430	$ 18.11	$ 18.11

United States Census Bureau in Past 12 Months (in 2015 dollars), 2011 - 2015	
Per Capita Income in Past 12 Months (in 2015 dollars), 2011 - 2015, Yealy Salary	$ 33,236.00
Per Capita Income in Past 12 Months (in 2015 dollars), 2011 - 2015, Per Hour Salary	$ 15.98

Entity	Link
US Census Bureau	https://www.census.gov/quickfacts/fact/map/NY/INC910215#viewtop
Bureau Of Labor Statistics	https://www.bls.gov/oes/current/oes_ny.htm
Bureau Of Labor Statistics	https://www.bls.gov/oes/current/oes_3600001.htm
Bureau Of Labor Statistics	https://www.bls.gov/oes/current/msa_def.htm#3600001

UNY Elec CY16 Meter Changes													
Category	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**CY16 Total**
Meter Change - Capital Total	1,684	1,717	1,823	2,147	1,429	1,344	1,083	1,359	1,497	1,721	1,346	1,485	**18,635**
Meter Change - O&M Total	58	15	12	21	6	13	8	9	16	31	18	20	**227**
Total UNY Elec	**1,742**	**1,732**	**1,835**	**2,168**	**1,435**	**1,357**	**1,091**	**1,368**	**1,513**	**1,752**	**1,364**	**1,505**	**18,862**

UNY Gas CY16 Meter Changes													
Category	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**CY16 Total**
Meter Change - Capital Total	1,516	1,670	1,484	2,037	2,000	1,153	686	1,506	1,120	1,105	1,246	1,204	**16,727**
Meter Change - O&M Total	138	99	186	253	221	198	145	178	154	217	204	244	**2,237**
Total UNY Gas	**1,654**	**1,769**	**1,670**	**2,290**	**2,221**	**1,351**	**831**	**1,684**	**1,274**	**1,322**	**1,450**	**1,448**	**18,964**

UNY CY16 Meter Changes													
Category	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**CY16 Total**
Meter Change - Capital Total	3,200	3,387	3,307	4,184	3,429	2,497	1,769	2,865	2,617	2,826	2,592	2,689	**35,362**
Meter Change - O&M Total	196	114	198	274	227	211	153	187	170	248	222	264	**2,464**
Total UNY Gas	**3,396**	**3,501**	**3,505**	**4,458**	**3,656**	**2,708**	**1,922**	**3,052**	**2,787**	**3,074**	**2,814**	**2,953**	**37,826**

Appointments - 2016														
INDICATOR	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**YTD Total**	**YTD Avg**
Appointments m	2,083	2,203	2,332	2,721	2,699	2,738	2,115	2,964	2,673	2,908	2,671	2,185	**30,292**	**2,524**
Appointments ke	2,068	2,174	2,292	2,698	2,674	2,717	2,095	2,936	2,647	2,869	2,629	2,149	29,948	**2,496**
Appt kept $	99%	99%	98%	99%	99%	99%	99%	99%	99%	99%	98%	98%	99%	99%

Month Name	Year	Appointment Renegotiated	Count - Other Orders Completed	Count - Other Orders UTC	Count - Elec and Gas WrkOrders	Count - Electric Orders Completed	Count - Electric Orders UTC	Count - Gas Orders Completed	Count - Gas Orders UTC	# Early Appointments	# Late Appointments	# On Time Appointments	# Total Appointments
JAN	2016	N	38	9	641	345	89	726	143	5	8	1978	1991
JAN	2016	Y	0	0	21	21	1	49	0	0	2	90	92
FEB	2016	N	44	3	686	428	89	758	110	6	21	2091	2118
FEB	2016	Y	1	0	24	18	0	40	2	0	2	83	85
MAR	2016	N	82	9	711	449	98	754	133	14	25	2197	2236
MAR	2016	Y	4	0	32	25	2	33	0	1	0	95	96
APR	2016	N	48	4	861	462	78	1,055	130	12	11	2615	2638
APR	2016	Y	2	0	26	22	0	32	1	0	0	83	83
MAY	2016	N	46	0	998	453	82	893	117	5	19	2565	2589
MAY	2016	Y	1	0	40	21	2	41	4	0	1	108	109
JUN	2016	N	69	8	1,113	513	81	748	107	6	14	2619	2639
JUN	2016	Y	3	0	48	20	4	23	1	0	1	98	99
JUL	2016	N	39	3	1,007	439	74	409	71	8	11	2023	2042
JUL	2016	Y	2	0	26	16	4	23	2	1	0	72	73
AUG	2016	N	50	4	1,238	559	91	796	143	8	19	2854	2881
AUG	2016	Y	0	0	37	15	1	30	0	1	0	82	83
SEP	2016	N	47	2	1,091	508	97	721	122	7	19	2562	2588
SEP	2016	Y	1	0	36	16	1	31	0	0	0	85	85
OCT	2016	N	55	3	1,032	497	100	976	139	8	31	2763	2802
OCT	2016	Y	0	1	32	21	3	46	2	0	0	105	105
NOV	2016	N	68	5	952	487	107	807	149	9	31	2535	2575
NOV	2016	Y	1	0	27	27	3	35	3	0	2	94	96
DEC	2016	N	52	4	760	434	101	623	113	15	22	2050	2087
DEC	2016	Y	2	0	28	15	3	46	6	0	1	99	100
2016			**655**	**55**	**11,467**	**5,811**	**1,111**	**9,695**	**1,498**			**29,946**	**30,292**
TOTALS			**Total Other =**	**710**		**Total Elec =**	**6,922**	**Total Gas =**	**11,193**				

Date of Request: July 21, 2017 Request No. DPS-659 AT-13
Due Date: July 31, 2017 NMPC Req. No. NM-1323

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure & Operations Panel

SUBJECT: **GAS BUSINESS ENABLEMENT (GBE) IMPLEMENTATION**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

With reference to the Company's response to DPS-433(1), describe how the technology involved in the proposed GBE platform differs from that of other similar, large scale Information Systems (IS) projects untaken by the Company in the past five years. Is the level of customization a potential road block for implementation? Why or why not?

Response:

The primary difference between the proposed GBE platforms and other large programs undertaken in the past five years is the extent to which GBE is expected to leverage cloud-based computing and standard solutions (*e.g.*, SaaS, cloud-based integration tools that minimize the need to build point-to-point interfaces). The benefits to a cloud approach, as described in the Direct Testimony of the Gas Infrastructure and Operations ("GIOP") Panel (p. 96), include faster implementation and adoption of enhancements, easier upgrades (when needed), and reduced risk of obsolescence in the future. In addition, National Grid's ability to implement and timely deliver SaaS and cloud based solutions is improved because these solutions (i) require fewer upgrades to legacy infrastructure, (ii) leverage standardization that will facilitate external interfaces with third party partners, and (iii) provide the capabilities to be easily scaled for additional capacity.

In addition, by configuring the products with standard mechanisms and tools provided by the software suppliers and/or through the use of existing market-based add-on solutions that are built

to handle specific requirements in conjunction with the core Maximo and Salesforce products, GBE will minimize the need for customization. For this reason, customization is not expected to be a roadblock to implementation.

Finally, GBE will be using the Agile development methodology, which involves close collaboration between the IS and business teams in short-cycles to allow earlier release of functionality to business users with prioritized enhancements to follow. In conjunction with the use of the Agile methodology, GBE will be using tools that facilitate the development and delivery of the solution in an automated and collaborative way. Examples include Agile planning, automated testing, and automated migration software. The Agile methodology is described in the Direct Testimony of the GIOP Panel (p. 95).

These approaches have enabled the Company to develop a phased implementation roadmap where capabilities are deployed over time rather than batched all together. The Company used three main sequencing criteria when developing the roadmap for the GBE initiatives:

1. Address Operational Risk: Many of the systems to be replaced and modernized as part of GBE are critical to support the safe delivery of service to customers, as well as National Grid's gas pipeline safety and compliance obligations. Due to the complexity of the legacy system integrations and data transfers supporting these functions, deployment of new system will take significant time to deliver. Therefore, National Grid prioritized these systems by scheduling replacement as early as possible in the roadmap.
2. Manage Down Delivery Risk: In preparing the roadmap, it was important to find ways to minimize the risk of rework and reduce the project risk (both financial and schedule). One of the elements built into the roadmap to help manage delivery risk was the concept of early releases to confirm quality early and, if necessary, make adjustments that will result in a better end product. The roadmap was constructed in a way that establishes core capabilities early and confirms complex components, thereby minimizing overall delivery risk. Additionally, as discussed above, delivery risk is reduced by using Agile delivery methods, phasing of capabilities over time, phasing of implementation to each jurisdiction rather than a 'big bang' approach, and stage gating before new capabilities are released to each jurisdiction (see the Direct Testimony of the Gas Infrastructure and Operations Panel (pgs. 94-95)).
3. Realize Value Early: Some initiatives can deliver value in a short period of time through Agile implementations, while other initiatives take longer to deliver because of the sheer size of the change and complexity of the dependencies. To "Realize Value Early," the roadmap initiatives were designed to deliver minimal yet completely usable products to the business allowing for value to be realized and feedback to be collected from the business, which will enable National Grid to make timely adjustment if necessary. Examples of this include: building out the Company Driven Work: Collections and non-Appointment Offs – ELECTRIC/GAS solution described in Exhibit __ (GIOP-9) while more complex elements are built. The initiatives and their releases are structured to provide "landing points," which allow the business to use the product that is delivered for an extended period as the business awaits deployment of future capabilities.

The Company's approach to the design and rollout of solutions along the roadmap allows prioritization on a risk basis and enables capabilities to be deployed earlier than would traditionally be the case, resulting in the delivery of value earlier but also creating additional learning opportunities that will enhance the overall final solution.

Name of Respondent:
Johnny Johnston

Date of Reply:
July 31, 2017

Investment Name	Programs	INVP #	Work Order	Bill Pool	In Service Date	Amortization Period	FY19 CAPEX
Asset Analytics Integration	GBE- Asset Management			G210	12/1/20	120	-
Business Architecture - Organization Design & Transition	GBE- Business Enablement			G210			-
Campaign Management	GBE- Customer Engagement			G210			-
Channel Analytics	GBE- Customer Engagement			G210			-
Complex Design (CAD) & Estimating (ESW)	GBE- Asset Management			G210	3/1/21	120	-
Construction Planning	GBE- Supply Chain			G210			-
Core Projects & Program Management	GBE- Work Management			G210	6/1/21	120	-
CRM / Contact Center	GBE- Customer Engagement			G210	6/1/20	120	15,200,000
Customer & Employee Journey Mobilization	GBE- Customer Engagement			G210			-
Customer Experience Program Leadership - 1	GBE- Customer Engagement			G210	3/1/19	120	260,229
Customer Experience Program Leadership - 2	GBE- Customer Engagement			G210	3/1/20	120	-
Customer Experience Program Leadership - 3	GBE- Customer Engagement			G210	3/1/21	120	-
Customer Interaction - First Release	GBE- Customer Engagement			G210	10/1/19	120	1,780,471
Customer Interaction - Second Release	GBE- Customer Engagement			G210	1/1/21	120	-
CxT Portal & Channel Management	GBE- Customer Engagement			G210	6/1/19	120	6,679,688
Data Cleansing Execution	GBE- Supply Chain			G210			-
Defined Data Cleansing Approach	GBE- Supply Chain			G210			-
Design & Estimating Process Stabilization	GBE- Asset Management						
Design (GWD), Estimating (CU), & Mobility	GBE- Asset Management			G210	9/1/20	120	1,729,295
EAM-FIN Integration	GBE- Asset Management			G210	6/1/19	120	979,407
Employee Support Interaction - First Release	GBE- Customer Engagement			G210	10/1/19	120	3,871,396
Employee Support Interaction - Second Release	GBE- Customer Engagement			G210	7/1/20	120	-
Enhancements	GBE- Asset Management			G210	12/1/18	120	600,945
Future State Culture Definition	GBE- Business Enablement			G210			-
GIS (GWD/CU) - PPM Integration	GBE- Asset Management			G210	12/1/20	120	-
Integrated Supply Feasibility Assessment	GBE- Supply Chain			G210			-
Inventory Optimization	GBE- Supply Chain			G210			-
Inventory Strategy	GBE- Supply Chain			G210			-
Knowledge Transition & Collaboration Strategy	GBE- Business Enablement			G210			-
Labor Contract Strategy & Implementation Support	GBE- Business Enablement			G210			-
Large Commercial & Landlord Interaction	GBE- Customer Engagement			G210	7/1/20	120	15,723
Leadership Capability Development	GBE- Business Enablement			G210			-
Maintenance & Inspection Planning	GBE- Supply Chain			G210			-
Networking Transportation & Optimization Analysis	GBE- Supply Chain			G210			-
Networking Transportation & Optimization Implementation	GBE- Supply Chain			G210			-
Operations Performance, Governance & Value Realization	GBE- Business Enablement			G210			-
Program and Project Management Planning	GBE- Supply Chain			G210			-
Program Business Readiness	GBE- Business Enablement			G210			-
Program Business Sustainment - 1	GBE- Business Enablement			G210	3/1/19	120	69,617
Program Business Sustainment - 2	GBE- Business Enablement			G210	3/1/21	120	-
Program Business Sustainment - 3	GBE- Business Enablement						
Program Business Sustainment - 4	GBE- Business Enablement						
Program Learning Management - 1	GBE- Business Enablement			G210	3/1/18	120	-
Program Learning Management - 2	GBE- Business Enablement			G210	3/1/19	120	130,211
Program Learning Management - 3	GBE- Business Enablement			G210	3/1/20	120	-
Program Learning Management - 4	GBE- Business Enablement			G210	3/1/21	120	-
Program Learning Management - 5	GBE- Business Enablement						
Program Learning Management - 6	GBE- Business Enablement						
Program Transformational Change Office - 2	GBE- Business Enablement			G210	3/1/19	120	1,516,310
Program Transformational Change Office - 1	GBE- Business Enablement			G210	3/1/18	120	-
Program Transformational Change Office - 3	GBE- Business Enablement			G210	3/1/20	120	-
Program Transformational Change Office - 4	GBE- Business Enablement			G210	3/1/21	120	-
Program Transformational Change Office - 5	GBE- Business Enablement						
Program Transformational Change Office - 6	GBE- Business Enablement						
Regulatory/ Compliance	GBE- Regulatory and Compliance			G210	9/1/19	120	1,500,000
SAP and Application Integration Development- Release 1-1	GBE- Information Services Enabling			G210	3/1/18	120	-
SAP and Application Integration Development- Release 1-2	GBE- Information Services Enabling			G210	3/1/19	120	4,548,168
SAP and Application Integration Development- Release 1-3	GBE- Information Services Enabling			G210	3/1/20	120	-
SAP and Application Integration Development- Release 1-4	GBE- Information Services Enabling			G210	3/1/21	120	-
SAP and Application Integration Development- Release 2-1	GBE- Information Services Enabling			G210	3/1/19	120	5,055,712
SAP and Application Integration Development- Release 2-2	GBE- Information Services Enabling			G210	3/1/20	120	-
SAP and Application Integration Development- Release 3-1	GBE- Information Services Enabling			G210	3/1/20	120	-
SAP and Application Integration Development- Release 3-2	GBE- Information Services Enabling			G210	3/1/21	120	-
SAP and Application Integration Development- Release 3-3	GBE- Information Services Enabling						
SC - Business Architecture Design	GBE- Supply Chain			G210			-
Skills/ Capability Assessment & Curriculum Redesign	GBE- Business Enablement			G210			-
Supply Chain Program Leadership	GBE- Supply Chain			G210	3/1/19	120	565,045
Supply Chain Program Leadership	GBE- Supply Chain			G210	3/1/20	120	-
Use Case No.1 - Asset Risk	GBE- Asset Management			G210	3/1/21	120	-
Warehousing Optimization	GBE- Supply Chain			G210			-
WMFE Optimization	GBE- Work Management			G210	3/1/22	120	-
Work Forecasting & Planning - solution	GBE- Work Management			G210	5/1/21	120	-
Workforce Strategy Planning & Implementation Support	GBE- Business Enablement			G210			-

44,502,215

Enhanced GBE Capabilities ($/000s)

	FY19	FY20	FY21	Total
CAPEX	$44,502	$29,056	$27,049	$100,607
OPEX	$31,626	$14,523	$5,699	$51,848
Total	$76,128	$43,579	$32,747	$152,455

FY19 OPEX	FY20 CAPEX	FY20 OPEX	FY21 CAPEX	FY21 OPEX	Total US CapEx Spend	Total US OpEx Spend	TOTAL
-	-	-	1,764,202	-	1,764,202	-	$1,764,202
2,536,988	-	152,707	-	-	-	2,689,695	$2,689,695
-	-	-	-	38,522	-	38,522	$38,522
-	-	-	-	78,455	-	78,455	$78,455
-	-	-	2,389,087	154,343	2,389,087	154,343	$2,543,430
-	-	806,766	-	-	-	806,766	$806,766
-	-	-	3,134,061	348,229	3,134,061	348,229	$3,482,290
800,000	3,800,000	200,000	-	-	19,000,000	1,000,000	$20,000,000
-	-	-	-	-	-	-	$0
780,687	-	-	-	-	260,229	780,687	$1,040,916
-	266,277	798,831	-	-	266,277	798,831	$1,065,108
-	-	-	203,177	609,513	203,177	609,513	$812,690
93,709	3,016,074	158,741	-	-	4,796,546	252,450	$5,048,995
-	-	-	2,010,254	105,803	2,010,254	105,803	$2,116,057
351,563	5,195,313	273,438	-	-	11,875,000	625,000	$12,500,000
543,101	-	-	-	-	-	543,101	$543,101
362,067	-	-	-	-	-	362,067	$362,067
					-	-	$0
192,144	4,920,570	546,730	3,201,244	355,694	9,851,109	1,094,568	$10,945,677
-	798,695	-	-	-	1,778,102	-	$1,778,102
203,758	4,082,735	214,881	-	-	7,954,131	418,638	$8,372,769
-	-	-	292,791	15,410	292,791	15,410	$308,201
31,629	-	-	-	-	600,945	31,629	$632,574
-	-	-	-	-	-	-	$0
-	-	-	844,849	-	844,849	-	$844,849
260,211	-	-	-	-	-	260,211	$260,211
677,174	-	-	-	-	-	677,174	$677,174
406,304	-	-	-	-	-	406,304	$406,304
613,243	-	-	-	-	-	613,243	$613,243
76,353	-	78,455	-	80,616	-	235,424	$235,424
828	19,653	1,034	1,411,132	74,270	1,446,508	76,132	$1,522,640
1,566,624	-	169,949	-	-	-	1,736,574	$1,736,574
788,068	-	-	-	-	-	788,068	$788,068
1,083,478	-	-	-	-	-	1,083,478	$1,083,478
1,083,478	-	-	-	-	-	1,083,478	$1,083,478
1,022,926	-	227,732	-	173,348	-	1,424,006	$1,424,006
788,068	-	-	-	-	-	788,068	$788,068
1,232,927	-	1,126,682	-	464,574	-	2,824,183	$2,824,183
208,850	-	-	-	-	69,617	208,850	$278,467
-	-	-	221,771	665,312	221,771	665,312	$887,083
					-	-	$0
					-	-	$0
-	-	-	-	-	-	-	$0
390,632	-	-	-	-	130,211	390,632	$520,843
-	173,060	519,181	-	-	173,060	519,181	$692,241
-	-	-	195,721	587,163	195,721	587,163	$782,883
					-	-	$0
					-	-	$0
2,642,422	-	-	-	-	1,516,310	2,642,422	$4,158,731
-	-	-	-	-	-	-	$0
-	368,704	1,805,991	-	-	368,704	1,805,991	$2,174,695
-	-	-	169,648	678,006	169,648	678,006	$847,655
					-	-	$0
					-	-	$0
9,000,000	750,000	6,350,000	-	500,000	2,250,000	15,850,000	$18,100,000
-	-	-	-	-	-	-	$0
-	-	-	-	-	4,548,168	-	$4,548,168
-	600,000	-	-	-	600,000	-	$600,000
-	-	-	600,000	-	600,000	-	$600,000
-	-	-	-	-	5,055,712	-	$5,055,712
-	4,397,065	-	-	-	4,397,065	-	$4,397,065
-	85,915	-	-	-	85,915	-	$85,915
-	-	-	2,326,606	-	2,326,606	-	$2,326,606
					-	-	$0
445,855	-	-	-	-	-	445,855	$445,855
556,933	-	171,590	-	-	-	728,523	$728,523
1,695,136	-		-		565,045	1,695,136	$2,260,181
	235,258	705,773	-		235,258	705,773	$941,031
-	-	-	3,591,031	189,002	3,591,031	189,002	$3,780,033
406,304	-	-	-	-	-	406,304	$406,304
-	346,828	38,536	2,984,574	331,619	3,331,402	370,156	$3,701,558
-	-	-	1,708,505	189,834	1,708,505	189,834	$1,898,339
784,576	-	176,171	-	58,938	-	1,019,685	$1,019,685
31,626,033	29,056,147	14,523,187	27,048,653	5,698,650	**100,607,015**	**51,847,870**	**152,454,885**

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Asset Analytics Integration	AIPM	12/31/2020	Prioritize asset investments according to various risk factors including asset risk. A strong emphasis is on utilizing Asset Analytics for determining asset risk. Monetize asset risk in the form of amount of asset risk units mitigated per dollar of asset investment Provide a view current levels of asset risk and future levels of asset risk after asset investment
EAM-FIN Integration	AIPM	6/30/2019	Integrate with the EAM so that the asset hierarchy in EAM is referenced in Asset Investment Planning Tool (AIPM). This will allow for updates to the asset hierarchy in EAM to automatically be reflected in AIPM. Asset risk and prioritization can now be tracked at the asset level. Full functionality of asset risk is enabled once Asset Analytics is in place Integrate with FIN to obtain actual project cost (as constructed). This shall inform deferral/accelerate decisions of future work in the Annual Work Plan. Run reports which identify projects outside of budget and schedule tolerances and take corrective action. Also evaluate variance of Construction Grade estimate versus As Constructed values. Design and deploy Level 4 (L4) business processes, governance, and policies Training on process and technology enhancements
Enhancements	AIPM	12/31/2018	Example enhancements include the following: Setting up multi-year programs and associated projects Establishing a Stage-Gate approval process including Project Initiation Form (PIF) fields for each stage gate Defining an approval hierarchy and automating the approval process through alerts or email notification Provide the ability to evaluate different investment options and evaluate CapEx and OpEx tradeoffs Forecast blanket work including emergency work, customer growth, muni/city/state requests based on historical/projected data and to establish placeholder annual blanket budgets. Identify opportunities for bundling projects based on asset type, geography, asset risk factor, category (growth, end-of-life maintenance capital, regulatory driven, mandatory, non-mandatory, O&M, etc.), etc. Create separate 'portfolio views' of the work container (e.g., by geography/ cost center, by category, by asset class, by stage gate approval, by work type (growth, end-of-life, refurbishment, maintenance, etc.)) Store multiple scenarios of the proposed Annual Work Plan. Variables within the scenarios shall include a different mix of projects which focus on different strategic objectives, different funding amounts, and sensitivity analysis related to risk. Develop rolling multi-year repair vs. replace vs. run to failure vs. maintain decision process Design and deploy Level 4 (L4) business processes, governance, and policies Training on process and technology enhancements
GIS (GWD/CU) - PPM Integration	AIPM	12/1/2020	Accept inputs on project estimates from the GWD/CU and CAD/ESW library Equate project estimate inputs into resources (people, material, and equipment) needs Enhanced bundling capability to spatially visualize project location and to bundle projects based on their location (and unbundle) Incorporate work volumes tied with financials for the 5-10 year plan (maintenance and capital work) for both project and blanket estimates (e.g. emergency work budgets, corporate requests with changes in spend/budget, maintenance program, etc.). Integrate with PPM to proactively understand potential project overrun issues in advance and take corrective action. Utilize Earned Value (EV), Estimate to Complete (ETC), Estimate at Completion (EAC), Budget Variance (BV), Schedule Variance (SV), etc. Optimize the investment plan under resource (labor, equipment, materials, etc.), financial (CapEx and OpEx), regulatory and network constraints and to identify and compare trade offs between investment options, including but not limited to risk reduction, cost, and resource use Ability to translate projects into supply/demand forecasts for resources (people, material, and equipment) and to communicate the information (taking into account that the granularity of the resource supply/demand is limited to the granularity of the estimate provided to the tool)
AM Program Leadership	AM Program Leadership	THROUGHOUT THE PROGRAM	Includes the program leader and supporting management team to lead and support the Asset Management work stream throughout its lifecycle, including establishment of direction and priorities, program oversight to insure delivery of scope within established budget, schedule and quality requirements, and issue and risk management Supports cross-portfolio integration and provides input and recommendations to the Portfolio Leadership Team as appropriate

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Use Case No.1 - Asset Risk	Asset - Advanced Analytics	3/1/2021	Provide the capability to aggregate multiple data sources of asset demographic, condition, health, and other information to provide a consolidated view of asset risk within and across asset classes. Provide the ability to view asset risk geospatially. Include the feature to have slide bars for a date range to overlay the planned improvements to mitigate the asset risk. This shall allow Asset Managers to better bundle and coordinate outages/customer interruption
Customer Experience Program Leadership	Customer Experience Program Leadership	THROUGHOUT THE PROGRAM	Proactive management and identification of dependencies across moduleModules and individual projects with the Customer Experience (CE) Module Project Management for the Customer Engagement Module including risk, issue, scope, schedule, budget management Stakeholder management with customer-facing organizations within CE Module affected lines of business/business units
Customer Interaction	Customer Interaction	NMPC RELEASE 1 = APRIL 2019, RELEASE 2 = JUNE 2020 , PROGRAM OCTOBER 2019, SEPTEMBER 2020	This initiative will implement several interactive support tools to enable simple and effective interactions with National Grid. It will provide Customers (Existing and Prospect) information they need to live their lives and be in control. It will provide Customers information about field activities as needed to deliver an effortless customer experience digitally. Part 1 Enhance core customer community foundation including login, registration and general UI / UX enhancements Part 2 Customers can: Find information about how to establish a gas service, the cost for the service (i.e., CIAC – using existing calculation methods) and apply for it on National Grid's website (CxT) or user's mobile device via web browser Schedule appointments with National Grid on their own terms to my home or business – and can change appointments to better fit their schedule Get reminders from National Grid about appointments and other activities (Should be similar to other reminders that the customer receives, such as billing reminders) – leveraging CxT technology Submit photos to National Grid, e.g. of my meter or problems at my premise Follow up on progress of my requests / appointments and view status Enter preferences for how to be contacted and how to interact with National Grid for use with CxT notification mechanism find out if crews are working in the vicinity
CxT Portal & Channel Management	Customer Interaction	PROGRAM = JUNE 2019.	implement foundational infrastructure to allow : Responsive web design leverage a web content management system send data through a Middleware to allow for a consistent message and appearance to customers Ability to enable mobile actions Ability to leverage Identity Access functionality for customers without a single sign on channel preference management; capturing how customers want to be communicated with
Large Commercial & Landlord Interaction	Customer Interaction	7/1/2020	Commercial & Property owners can: Bundle appointments together to help manage their time effectively, and can change them as needed to any schedule changes View status and progress of requests / appointments Delegate communication and interaction preferences (e.g., delegate point of contact for each of the properties) Submit pictures of e.g. meters on the property Find information about how to establish gas service, the cost for the service, and apply for it on National Grid's website or access web browser using mobile device Get information for things that are available, such as the LOFL (Leave on for Landlord) Receive notifications/alerts about an issue at one of my premises – leverage CxT technology Find out if there are crews working in the vicinity

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Complex Design (CAD) & Estimating (ESW)	Engineering, Design, Estimating & Mobility	3/1/2021	Design Tool implementation Implement a full set of computer aided design (CAD) tools. This will include office tools for complex designs as well as field sketch and estimating tools. Complex design templates and processes will be developed and implemented across the enterprise and the estimating software will be integrated for more consistent and accurate designs and estimates. Components will include: Develop and implement design processes that address allocation of work to Designers, greater communication with Field Engineers and more efficiency utilizing office-based design and reference tools. Standardize on a set of engineering tools, SOPs, standards and practices to be used across operating companies Standardize on a common CAD software. Train new users and upgrade existing users. Determine performance KPIs and metrics as well as a post-construction feedback loop for better accountability and continuous improvement.
Design & Estimating Process Stabilization	Engineering, Design, Estimating & Mobility	PROGRAM = SEPTEMBER 2020	Design & Estimating Process Stabilization Provide on-going support for Engineers following the introduction of: Graphical work design (GWD) and estimated with compatible units (CUs). CADand estimated with estimating software (ESW).
Design (GWD), Estimating (CU), & Mobility	Engineering, Design, Estimating & Mobility	9/1/2020	Design Tool implementation Implement a full set of Graphic Work Design (GWD) tools. This will include office tools for standard designs as well as field sketch and estimating tools. Standard design templates and processes will be developed and implemented across the enterprise and the CU library will be integrated for more consistent and accurate designs and estimates. Components will include: Develop and implement the Stage Gate Approval process Develop and implement design processes that address allocation of work to Designers, greater communication with Field Engineers and more efficiency utilizing office-based design and reference tools. Standardize on a set of engineering tools, SOPs, standards and practices to be used across operating companies Deploy GWD within GIS where the GIS is utilizing an updated landbase and conflated assets. Determine performance KPIs and metrics as well as a post-construction feedback loop for better accountability and continuous improvement. Mobility Expand the mobile capabilities implemented in Release 1 for greater effectiveness in the Design and Estimating arena. The following components are included: Allow for electronic policies, standards and procedures which can be updated in real-time with updates pushed to field users Ability to field verify designs and update as-builts in the field through mobile technology. This includes mobile redlining as well as updating a restricted set of GIS and EAM attributes. Design and implement mobile technology for the design and estimating process to include field sketching and estimating. Coordinate with EAM/WM mobile technology design/implementation. People Evaluate the balance between centralized/regionalized Engineering resources and the connection to Field Engineering Develop newly defined and updated roles and responsibilities to execute the new business processes and utilize the new technology as well as better execution of non-design work (e.g., permits, mapping, etc.) Establish an Estimating Center of Excellence (ECoE) to manage/update the CU library and interface with Supply Chain on material codes. Identify the responsibility of Engineers doing estimates within their Engineering group versus the ECoE as curators of the estimating process and CU library. Develop a training program to help improve the quality and effectiveness of Design and Estimation resources

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Construction Planning	Integrated Supply & Demand Planning	SC INTEGRATION IN NMPC JUNE 2020, PROGRAM = SEPTEMBER 2020	Design supply plan database Collect supply data by gathering large projects plans and budgets Confirm demand drivers Determine the projects vs portfolio mix Develop demand plan by conducting interviews and analyzing project plans Validate and revise demand plan with stakeholders Publish demand plan to stakeholders Develop revision and recurring meeting processes Transfer knowledge to new demand plan owners Support early revisions to ensure smooth transition
Maintenance & Inspection Planning	Integrated Supply & Demand Planning	SC INTEGRATION IN NMPC JUNE 2020, PROGRAM = SEPTEMBER 2020	Design supply plan database Collect supply data by gathering maintenance plans, existing contracts, budgets, and other sources of information from concerned lines of business Develop demand plan by conducting interviews and discussing demand drivers Validate and revise demand plan with Stakeholders Publish demand plan to SC stakeholders Develop revision and recurring meeting processes Transfer knowledge to new demand plan owners Support early revisions to ensure smooth transition
Program and Project Management Planning	Integrated Supply & Demand Planning	SC INTEGRATION IN NMPC JUNE 2020, PROGRAM = SEPTEMBER 2020	Design supply plan database Collect supply data by gathering large projects and program plans and budgets Confirm demand drivers Determine the projects vs portfolio mix Develop demand plan by conducting interviews and analyzing project plans Validate and revise demand plan with stakeholders Publish demand plan to stakeholders Develop revision and recurring meeting processes Transfer knowledge to new demand plan owners Support early revisions to ensure smooth transition
Integrated Supply Feasibility Assessment	Integrated Supply Feasibility Evaluation and Strategy	SEPTEMBER 20 TO APRIL 2021 IS WHEN OPTIMIZATION IS APPLIED PROGRAM WIDE	The work will determine supplier spend segmentation across receiving locations (warehouse, barns, sites) and suppliers to assess current program scope, gaps in service, and optimum program setup. Detailed transactional analyses, labor analyses, and inventory assessments will be combined with site visits and negotiations in order to improve total cost of ownership. Evaluate capabilities Gas Operations will need from an Integrated Supply provider Understand the potential benefits and challenges, and develop a strategy for a feasible Integrated Supply solution Propose industry best practices in the priority areas of Safety, Operational Excellence, Customer Satisfaction and Emergency Preparedness Establish a detailed, clear plan to transition project outcomes to Shaping our Future In coordination with the Gas Operations Program and Project Management (release 1 and release 2), implement a process to integrate the demand of Projects and Programs needs with Supply Chain materials. This initiative will create a 'first cut' demand plan for the large programs and projects by collecting data from various sources and consolidating them into usable format for analysis while contributing to any requirements for the implementation of work management planning tools (e.g.; Primavera). This will provide an initial view of Program and Project Management material and services requirements for use in decision making.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Inventory Optimization	Inventory Optimization	SEPTEMBER 20 TO APRIL 2021 IS WHEN OPTIMIZATION IS APPLIED PROGRAM WIDE	The Inventory Optimization initiative will ensure that Gas Operations has the right inventory at the right time to complete the job. This initiative will analyze current inventory then develop and execute improvement opportunities for ensuring desired material availability while reducing excess inventory. The team will perform a deep data analysis, identify root causes of inventory problems, highlight gaps, and develop policies & procedures, performance metrics, and reports for effective inventory usage across the organization. Specific focus will be given to management of critical spares and inventory positioning. Prepare for analysis and align with all relevant stakeholders Obtain existing KPI repository and establish performance baseline; Data review and cleansing Review and Analyze Inventory Determine inventory classes Analyze inventory usage, excess and obsolescence Identify target inventory by Positioning location and by "Spare" classification Identify root cause and prioritize opportunities Define problem areas/functions, capability gaps, mitigate potential design issues Analyze current state against industry best practices Perform feasibility analysis and highlight priorities for implementation (quick wins, strategic implementations, etc.) Recommend improvement opportunities Develop performance management framework, metric scorecard and tracking parameters Create reports Inventory policy design Design stocking and usage policies for each class; Design optimal stocking and reordering levels for each class Pilot design in chosen geographies Develop deliverables Supply Chain organization Inventory Policy Inventory Performance Metrics scorecard Implementation Plan for Inventory Criteria and Parameters Recommendations on Inventory Levels
Inventory Strategy	Inventory Optimization	SEPTEMBER 20 TO APRIL 2021 IS WHEN OPTIMIZATION IS APPLIED PROGRAM WIDE	Analyze and define foundational inventory framework Determine service levels, item segmentation, critical spares Develop plan for enabling inventory structure Determine stock vs. buy decisions, sourcing strategy (use commercial vendor, e.g. Home Depot, for basic items rather than stocking them
Business Architecture - Organization Design & Transition	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Business Architecture Organization Design and Transition Initiative will conduct an organizational diagnostic, including span-of-control analysis, retirement and attrition analysis, and role title rationalization; define the detailed organization structure (L1-L3) including role descriptions and accountabilities in alignment with the new operating model; and work with Human Resources to facilitate the transition of employees into the new organization structure. The organization transition will begin with a pilot in one state to enable measured incremental improvements in operations performance before fully deploying new roles to the entire organization. For example, dependent on the future-state Operating Model, this Initiative would facilitate the identification of Process Owners, defining the specific expectations for the role and working with Human Resources to align expectations This Initiative would also facilitate the orderly transition of employees into new roles.
Future State Culture Definition	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Future State Culture Definition Initiative will define the desired to-be cultural attributes of the U.S. Gas Business, including values, beliefs and observable behaviors (e.g. accountability, agility and customer centricity). This Initiative is scheduled early in the Program and will provide a foundational input to many other Initiatives that will reinforce the values, beliefs and observable behaviors. For example, the Leadership Capability Development Initiative will introduce the future-state culture to the top, mid-level and front-line leaders across the U.S. Gas Business. These leaders will then introduce these attributes to their teams. The attributes will then be embedded into and reinforced through Initiative-level Agile change, communication and training activities.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Leadership Capability Development	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Leadership Capability Development Initiative will focus on building the leadership capabilities in the top 100, mid-level and front-line leaders necessary to lead their teams through the changes being implemented via the Gas Business Enablement Program to achieve the required levels of performance while reinforcing the future-state cultural attributes. During an initial strategy phase, this Initiative will define a leadership curriculum for each of the three leadership groups, working closely with Human Resources to build on existing leadership development Initiatives, such as the supervisor enablement pilot.
Operations Performance, Governance & Value Realization	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Operations Performance, Governance and Value Realization Initiative will define the baseline business case and develop a value framework and ownership model to drive sustained governance and performance. Building on the business case developed during the Strategic Assessment phase, this Initiative will establish the business case governance and value realization processes, including a detailed baseline of key performance metrics across workgroups and states in order to determine the underlying levels of performance necessary to achieve the business case and the associated performance gap between current and future-state. The Initiative will then define and implement a Performance Management Framework (e.g., performance scorecards, data quality scorecard, review and refresh key business scorecards,, sustainment) and align with Strategic Planning (e.g., growth playbook, strategy refresh / annual strategy refresh assessing 6 priority areas/programs and next steps).
Skills/ Capability Assessment & Curriculum Redesign	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Skills / Capability Assessment and Curriculum Redesign Initiative will identify current skills, capabilities and gaps for learning development and augmentation. Recognition of skill gaps that will emerge over time as existing workforce demographics shift implies a need for increased mastery of new employees as well as existing employees as roles and capability needs shift with emerging and more complex work and advanced technologies
Knowledge Transition & Collaboration Strategy	Program Business Readiness & Sustainment	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Knowledge Transition and Collaboration Strategy initiative will assess the landscape and future needs to facilitate knowledge transfer and promote collaboration across the business. The assessment would include a roadmap that spans across the business. This would entail: Objectives, Metrics, Processes, Technologies, Organization, Governance
Program Business Readiness	Program Business Readiness & Sustainment	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Business Readiness Initiative is a program level function which focuses on coordinating business readiness activities across the Gas Business Enablement program. Managed via the Program Transformational Change Office, the team will serve as the primary liaison between the Program team and business leadership. Early in the Program, key activities include helping business leadership understand the scope and timing of the changes, the impact to each organization, business resource requirements to support the Program and the development of Readiness Action Plans that demonstrate business ownership of the outcomes. For example, in any Program, it is critical that business leadership understands what the Program will provide, the questions that it will answer, and just as important, the related questions that the Program will not answer and that the business needs to anticipate and plan to answer in order to be successful. As capabilities start to be released into the organization, the Business Readiness team would then work closely with deployment teams and Initiative-level Agile change management and training efforts to assess readiness and facilitate go-live decisions
Program Business Sustainment	Program Business Readiness & Sustainment	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Business Sustainment Initiative is structured into two releases to define and implement the necessary roles, teams and processes to sustain the capabilities deployed during the Gas Business Enablement Program. Release 1 defines an initial strategy mid-way through the Program that will serve as an input to other GBE Initiatives to "design with the end in mind". Release 2 is scheduled late in the Program timeline to design and implement the roles, teams and processes. This Initiative is not intended to bear the entire burden of sustaining capabilities and value. Sustaining the changes implemented during the Gas Business Enablement Program will require much more than just implementing roles, teams and processes, it will require the coordination across multiple Initiatives, including Organization Transition, Future-state Culture, Program Learning Strategy, Leadership Capability Development, Data Management, etc.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Change Management COE Development & Implementation	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Agile Change Management CoE Strategy initiative will establish a Change Management CoE as part of a long term capability within the organization. This would entail: **Centralized**, skilled team to manage and monitor change management activities across the business leveraging budget, time and resource availability **Dedicated** single point of contact to support Projects and Business Function teams' business needs **Standardized** operating model, processes, tools and templates to efficiently and consistently support Projects and Business Functions in all change management activities **Integrated** cross business function and project methods / deliverables (e.g. impact analysis, overall work plans, communications, training) to streamline work effort and expedite Implementation at the impacted, end-user level **Centralized** program management and governance approach for issue tracking, status reporting and measuring change effectiveness
Labor Contract Strategy & Implementation Support	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	Similar to the Workforce Strategy Initiative, the Labor Strategy Initiative will coordinate with the Process Design Initiative to document potential labor impacts, assess the impacts vs. existing bargaining unit contracts, and coordinate with Labor Relations to define an overall labor contract strategy, including a detailed contract review to determine which impacts will require negotiated changes. The resulting labor strategy will include a timeline of key changes to be implemented by the program, an assessment of which contracts will be impacted by the changes, key dependencies, and a recommended negotiation strategy and timeline. After the initial strategy development, Labor Relations will own the Labor Strategy, coordinating with the Program Transformational Change Office and individual Initiatives to execute the strategy. Annually, the Program will work with Labor Relations to refresh the Labor Strategy based on the latest developments.
Program Learning Management	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Learning Management Initiative operates in concert with the Transformational Change Office to define the overall Program Learning Strategy; serve as the primary interface between the Program and National Grid's Learning &Development organization to coordinate learning standards, facility, infrastructure and support needs; and coordinate standard, consistent leading approaches to learning across all technology / process Initiatives. Following the strategy release, the Program Learning Management Initiative shifts to serve a learning solution architect and coordination role, ensuring that standards and leading practices are being uniformly adopted across Initiatives, especially with regard to Agile learning approaches. In Release 3, the Program Learning Management Initiative shifts focus once more toward ensuring the sustainability of the Program Learning content and capabilities.
Program Transformational Change Office	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Transformational Change Office is a program-level function which focuses on enablement, coordination and standardization in collaboration with Initiatives across the Program portfolio of Initiatives. The Office defines and manages the overall Change Architecture of the Program, ensuring the intended end-to-end linkages between Initiatives and leveraging analytics, such as Organizational Health Analytics, to chart the course, define tailored interventions for each workgroup and state and drive leadership engagement and alignment across the Program. The Office would also develop and maintain a Program-level communication plan to engage and align all Stakeholder, both internal and external. The Office would also maintain a change intensity heat map as a tool to manage the overall changes, highlighting when and how various workgroups are impacted by GBE and non-GBE Initiatives (e.g. Shaping our Future) to manage the overall changes being deployed to the U.S. Gas Business.
Workforce Strategy Planning & Implementation Support	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Workforce Strategy Initiative will coordinate with the Process Design Initiative to expand on the Change Impacts collected during the Strategic Assessment Phase, with a focus on key changes that will impact the volume of work; required capabilities, skills & experience; and new or significantly changed roles. The Workforce Strategy will closely integrate with the Labor Strategy Initiative, and will work closely with Human Resources and Labor Relations to develop an overall workforce strategy for the U.S. Gas Business. The workforce strategy will forecast FTE requirements over the duration of the GBE Program as capabilities are released, highlighting where workforces are expected to increase, decrease, or experience significant changes that would impact recruiting and talent development. The workforce strategy would also specifically outline how the Program will work with Human Resources over the duration of the Program to facilitate the workforce changes, including role / job descriptions, grading, posting, recruiting, etc. After the initial strategy development, Human Resources will own the Workforce Strategy, coordinating with the Program Transformational Change Office, the Business Architecture – Organization Transition and individual Initiatives to execute the strategy. Annually, the Program will work with Human Resources to refresh the Workforce Strategy based on the Program schedule, capabilities released to date, and anticipated changes over the next 9-12 months.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Core Projects & Program Management	Projects & Program Management	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	Implement Project Management platform specifically focused on scheduled/long cycle work (projects/programs) with the following capabilities: Planning & Scheduling; Resource Management & Capacity Planning; Earned Value Management; Risk & Issue Management; Project collaboration (design review, meeting minutes, action items); Funding / budgeting / forecasting; Management of Change; Permit management; Emergent work tracking; Commissioning Develop standard work procedures, KPI's, metrics, and targets Develop templates and forms as necessary Define processes to be automated and the design of workflows or methods to automate Conversion of project data Develop detailed implementation and training plans for end users
Regulatory/ Compliance	Regulatory/ Compliance	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	standards operating procedures documentation, document management and technical training Improves electronic field data capture with prompts and controls developed within the solution to drive accurate and complete capture of required information, and will enhance records to document compliance with less reliance on paper Improves field access to customer and asset data with enhanced visibility utilizing maps and process documentation on mobile devices to provide employees with the right information to comply with regulatory requirements Improved training and job aids such as instructor and video-based training on mobile devices to improve operational performance
SAP and Application Integration Development- Release 1	Remediation & Integration	PROGRAM DATE = SEPTEMBER 2020	SAP and Application Integration Integrations (across EAM Solution, Resource Management, and Mobility) that leverage Comprehensive Integration Services and potential Mobility Platform Integration Framework. Integrations for applications that remain in portfolio, such as: Irthnet, Powerplan via SAP, E-Permits, GridForce, System Operating Procedures, SAP Systems (Multiple Modules), PCS – Corrosion Bass Trigon, etc. Align interface development for Primevera to EAM and Work Management; Develop integrations for associated applications. Application changes in SAP and Legacy Applications that will remain in the portfolio, to allow interface adapters, or batch jobs to take in new integrations as appropriate. Develop GIS and mobile GIS application integration for Mobile Platform; include populating mobile platform repository
SC - Business Architecture Design	SC - Business Architecture Design	PER SOW, SC PROGRAM DATE = OCTOBER 2019	Focus on standardizing and improving the policy, procedures and processes that have the most direct impact to Gas Operations. By creating and implementing standards, the integration cost and efforts for work and asset management to integrate to Supply Chain will be reduced. In addition, increase internal Gas Operations customer experience will be improved given the clarity around roles and responsibilities. Refine Supply Chain process hierarchy based on the to-be Supply Chain operating model. Refine and implement the new policies. Refine and implement the to-be processes, including interim processes as required to support transition to the to-be operating model. Provide support across projects to integrate and coordinate process development, documentation and implementation.
Customer & Employee Journey Mobilization	Structured Experiences	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	This initiative will leverage the Customer Journeys developed by the CxT program and other previous initiatives, and refine them as needed to articulate the future vision of GBE focused on the customer experience. In addition, this initiative will develop corresponding Employee Journeys articulating the future Employee experience required to deliver the GBE Customer Experience. The key outcome from this Initiative is agreement from all aspects of the business that these Journeys are the desired state and will guide project development over the course of the GBE program. A Customer Center of Excellence will be established to serve as the governing body for any Customer impacting decisions / initiatives. This includes defining the organizational structure for who ultimately is accountable for and owns the delivery of the Customer Experience, and the supporting organization.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Data Cleansing Execution	Supply Chain Master Data Improvements	PROGRAM = OCTOBER 2019	Data Cleansing Execution Update taxonomy on material master Identification of duplicate records Removal of duplicates from material and vendor masters Master data enrichment as per the agreed taxonomy and standards Establish KPIs related to master data request process Provide content for updating business process documentation and training to assist in maintaining the quality of data during create/change/flag for deletion processes
Defined Data Cleansing Approach	Supply Chain Master Data Improvements	PROGRAM = DECEMBER 2017	Define Data Cleansing Approach Define actions to perform related to the material and vendor master request process Define taxonomy, standards and data dictionary Conduct data quality analysis Identify master data super users within design, engineering, and warehouse Gas Operations
Supply Chain Program Leadership	Supply Chain Program Leadership	THROUGHOUT THE PROGRAM	Feasibility Evaluation and Strategy Understand current lifecycle processes Define basket of materials and services within scope Conduct 2 - 4 peer utility interviews & plan best practice utility visits Develop integrated supply model with high level process definitions, define savings models Develop integrated supply business case Determine go-forward materials fulfillment model Finalize integrated supply strategy Develop Deliverables To-be Fulfillment Model In-scope Market Basket of Materials Business Case
CRM / Contact Center	Support Interaction	6/1/2020	Contact Center Front End Solution Provide a platform to handle customer interactions including: Establishing service Account inquiries including billing issues, service suspension, etc.. Payment arrangements Compliments / Complaints Move-in / Move-out Outage reporting In-application visibility to work management information (Gas/short cycle Electric) and appointment scheduling capability 360 degree view of the customer, providing visibility to customer touchpoints, interactions and account history in one place Drive call deflection through supporting digital channels such as email and web-chat and driving the customer community Improve key metrics including but not limited to: first call close, average handle time, abandonment rate, and occupancy rate. Enhanced analytics and in-app reporting and dashboards to more effectively drive the business Create opportunities to collaborate internally across the organization to more effectively service customers

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Employee Support Interaction	Support Interaction	PROGRAM RELEASE 1 = OCTOBER 2019, RELEASE 2 = JULY 2020	This initiative will implement an interactive support tool to enable effective interactions by National Grid employees with Customers. It will provide all Internal National Grid Employees information about field activities required to better serve National Grid's customers. It will also a provide the Field Crew (including Contractors) with information about the Customers to make it easy to help them National Grid Employees can: Help customers when they contact us with questions about establishing new service, provide a quote, and help sign up the customer for service Schedule customer appointments that work for them and us View status and progress of a customers request / appointments and provide accurate updates when customers ask Capture and view customer preferences for how to interact with us See where crews are (in the vicinity), so when the customers call and say "who is outside my window? I can provide an accurate answer Receive and view customer photos (e.g. of their meter) Notify Field on additional information needed next time they go to the customer Contact the field real time when they are on site with a customer (or vice versa) so that I can help better address the customer needs National Grid Field Employees can: Get notified of all the information we (National Grid) need before my visit to the customer, so they are ready to ask for and capture that information Have easy access to information about the Customer and will be prepared when they get to the site Effectively suggest products and services to the customers by receiving prompts on mobile device on what to recommend Send emails to the Customer with tailored information to help them (links to National Grid web pages) Provide field workers with an accurate and near "real-time" view of customer information via their mobile application. Enables transparency between the Contact Center and the Field employees. Field employees will be able to see customer data and be able to have a dialogue with the contact center agent via Chatter while on-site. Enables field employees to capture and update customer information while on-site.
Campaign Management	Supporting through Data	PROGRAM DECEMBER 2017, WITH ENHANCMENTS DECEMBER 2019	Proactive identification of prospective customers, creation of offers, tracking of offer take-up rate of products and services (e.g. Energy Efficiency products, budget billing, eBill, payment arrangements, sales/conversion of appliances)
Channel Analytics	Supporting through Data	PROGRAM DECEMBER 2017, WITH ENHANCMENTS DECEMBER 2019	Data should be able to capture: Are customers able to complete an interaction/transaction using the Customer Portal or do they go to another channel to complete the transaction? What is the % of transaction completion success per channel without having to switch channels? If a customer switched, in what moment of the transactions? Did the customer contact us again within 48 hours? etc.. Is the Field Crew able to complete an interaction/transaction with the customers as intended or do they end up referring to the call center (instead of directing the customer to digital solutions as designed)?

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Networking Transportation & Optimization Analysis	Warehousing and Network Optimization	PROGRAM = JULY 2020	Network Optimization Analysis Validate current and future demand and service levels Define clear scenarios Validate network baseline Analyze warehouses/distribution centers for overall number required, optimal location, ideal sizes, and plan for scaling growth. Determine Benchmarks for distribution, warehousing and handling Refine distribution area to be delivered from each warehouse and to evaluate possible changes in warehouse locations to optimize the network Recommended ways to reduce variability and identified opportunities for cost reduction through production and mode shifts Develop Deliverables Summary of the Scenario Analysis Recommended network strategy Business case and implementation plan
Networking Transportation & Optimization Implementation	Warehousing and Network Optimization	PROGRAM = JULY 2020	Network Optimization Implementation (1 month Pilot in specific region with all below activities, followed by Full Implementation in all regions) Implemented change management structure “Quick wins" design and implementation Refined business case and performance tracking model Infrastructure development: design, build, test and migrate Re-design and/or re-tendering of Gas Operations Operating model roll-out
Warehousing Optimization	Warehousing and Network Optimization	PROGRAM = JULY 2020	Warehouse Optimization Organize inventory placement for maximum efficiency and remove material from work areas Review inventory receipt, storage, handling, and job preparation/packing/kitting processes Implement quality improvement program for increased performance and continuous improvement. Establish clear expectations and priorities based on value provided to Gas Operations and overall customer service Equip and enable the workforce for consistent execution Develop Deliverables Implementation Plan for improvement projects Formal Documentation for improved processes
WMFE Program Leadership	WMFE Program Leadership	THROUGHOUT THE PROGRAM	Includes the program leader and supporting management team to lead and support the WMFE work stream throughout its lifecycle including establishment of direction and priorities, program oversight to ensure delivery of scope within established budget, schedule and quality requirements, and issue and risk management Supports cross-portfolio integration

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
WMFE Optimization	Work Management & Field Enablement	3/1/2022	This release is set up to implement additional capabilities of EAM and Field Mobility along with integration to Project Management system. User Group: Customer Meter Service Field (In-house & Contractor Field Crew, Field Supervisors, Contractor Oversight), Maintenance & Construction (In-house & Contractor Field Crew, Field Supervisors, Contractor Oversight), Work Support, Engineering, and Resource Planning Work Type(s): Include work types listed in release 1, 3 and 6 Implement integration with EAM, Project Management system Enhance EAM capabilities which include auto work notifications, link project info in Project Management system to work orders, job plans and PMs in EAM Enhance Supervisor field mobile with additional capabilities, which include view and track crew/work orders progress spatially and send notification to crews Implement additional field mobile capabilities including mobile red lining, GIS mobile mapping (i.e., integrated with Work Management app) Training on process and technology enhancements
Work Forecasting & Planning - solution	Work Management & Field Enablement	5/1/2021	Implement single, enterprise work forecasting & planning platform for all jurisdictions with the following capabilities: User Group: Resource Planning Implement integration with Project Management, EAM, and HR (People/User) systems Provide one global view of work and resources (internal and contract resources) Design and deploy business and decision-making processes, governance, and policies including divisional nuances to support continuous improvement Ability to forecast through a statistical analysis of historical data, adjusted to future factors that may impact predicted volumes (e.g. weather, marketing campaigns, billing events etc.) Ability to optimize forecast of work to resources Provide training on process and technology enhancements

Date of Request: July 21, 2017 Request No. DPS-660 AT-14
Due Date: July 31, 2017 NMPC Req. No. NM-1324

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure & Operations Panel

SUBJECT: **GAS BUSINESS ENABLEMENT (GBE)**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

The alternatives considered for the GBE program are shown in Slide 36, Attachment 9 to your response to DPS-275. With reference to that response:

1. Describe the "backbone only" alternative.

2. The alternative selected was the "Value Oriented-Jurisdiction Deployment", at a cost of $458 million, or an incremental $185 million to the "backbone only" alternative. Provide a breakdown of the incremental $185 million by capital and operating costs for the Rate Year and Data Years.

3. What enhanced capabilities will the Company be able to provide customers with the incremental $185 million investment? Estimate the date that each enhanced capability will be available to customers.

Response:

1. The backbone only alternative focuses on upgrading the core work and asset management programs. Notably, this alternative does not address any enhancements to the customer experience, nor does it fully integrate asset management and work management solutions, including advanced analytics for work and asset management and supply chain, strategic change, or technical training, all of which help to mitigate operational and technical risk.

The scope of the backbone only alternative includes deployment of an Enterprise Asset Management ("EAM") system supporting and integrating work management, scheduling, and field mobility. Assets will be managed in the EAM, which will become the system of record for asset data through creation of a standardized asset hierarchy under this alternative. A common geospatial information system (GIS) will be integrated with EAM allowing improved visibility to asset data. A foundational element to the GBE Program is the Powerplan integration enhancements and integration of the financial systems. Further supporting the backbone only alternative are data quality and cleansing efforts to support the asset and work management systems as well as IS enabling efforts to establish an environment to support deployment of the new systems and provide for continuous improvement of the systems as technology developments, business needs, and/or regulatory requirements evolve. The duration of the backbone only alternative is approximately 3.5 years.

2. Please see Attachment 1. Please note that of the $458 million investment for the GBE Program, enhanced capabilities in-service by the Rate Year and Data Year or with operating expenses in the Rate Year or Data Year amount to a total capital and operating expense of approximately $152 million as shown in Attachment 2. The $152M is the proportion of the $185M forecast to be incurred in the Rate and Data Years with the remaining spend occurring in FY18, FY22 and FY23.

   It should be noted that despite the overall longer five year implementation timeframe of the enhanced capabilities, implementation of the enhanced capabilities will not extend the 3.5 year timeframe of the backbone capabilities as the focus remains on risk prioritized replacement of the core systems.

3. The enhanced capabilities include strategic change, talent management, and organization design; customer interaction platform; advanced asset and work management and supply chain analytics; and technical training. Importantly, the enhanced capabilities also transition support and maintenance to a modern SaaS model. Attachment 2 details the enhanced capabilities by initiative and with expected in-service dates. Benefits of the enhanced capabilities include:

   - Advanced asset investment planning capabilities, tools, and analytics for more effective asset replacement and maintenance prioritization, thus reducing asset risk and enhanced prioritization of capital investment;

   - Reduced planning complexity with visibility to all work in one core platform and seamless, electronic integration of work demand with other key platforms (*e.g.*, HR, supply chain) enabling more effective deployment of our resources;

   - Advanced GIS capabilities that enable graphical work design and graphical electronic field data capture – this will improve record accuracy and speed to maps being updated with new assets;

   - Advanced and consistent technical training via multiple media to improve employees' technical skills and simplify work methods resulting in enhanced

capability of field employees to consistently deliver work safely for customers, following the correct procedures and recording the required information correctly;

- Cloud/SaaS solution capabilities to facilitate keeping the solution updated in the future and supporting cyber security measures and future integrations with other platforms; and
- A change management program to support the organization through the change of systems and processes, and to help deliver the desired behaviors and outcomes from the GBE program.

Significant non-financial customer benefits to be achieved through the implementation of enhanced capabilities of the GBE Program include:

- a robust self-service platform for customers to interact with the Company via their preferred platform combined with an employee support platform providing consolidated customer information to allow the Company to respond quickly and accurately to customer inquiries;
- a reduction in waiting time for a customer commitment windows due to enhanced scheduling of work (see response to DPS-658);
- increased ability to convert to gas resulting from improved asset investment planning;
- increased safety and reliability with advanced asset analytics to effectively prioritize maintenance and reduce the number of leaks leading to outages;
- enhanced customer service and a reduction in CO2 emissions by enabling customers to switch from oil heat to natural gas heat with improved investment planning.

Name of Respondent:
Johnny Johnston

Date of Reply:
July 31, 2017

Investment Name	Programs	INVP #	Work Order	Bill Pool	In Service Date	Amortization Period	FY19 CAPEX	FY19 OPEX	FY20 CAPEX	FY20 OPEX	FY21 CAPEX	FY21 OPEX	Total US CapEx Spend	Total US OpEx Spend	TOTAL
Asset Analytics Integration	GBE- Asset Management			G2101	12/1/20	120	-	-	-	-	1,764,202	-	1,764,202	-	$1,764,202
Business Architecture - Organization Design & Transition	GBE- Business Enablement			G2101			-	2,536,988	-	152,707	-	-	-	2,689,695	$2,689,695
Campaign Management	GBE- Customer Engagement			G2101			-	-	-	-	-	38,522	-	38,522	$38,522
Channel Analytics	GBE- Customer Engagement			G2101			-	-	-	-	-	78,455	-	78,455	$78,455
Complex Design (CAD) & Estimating (ESW)	GBE- Asset Management			G2101	3/1/21	120	-	-	-	-	2,389,087	154,343	2,389,087	154,343	$2,543,430
Construction Planning	GBE- Supply Chain			G2101			-	-	-	806,766	-	-	-	-	$806,766
Core Projects & Program Management	GBE- Work Management			G2101	6/1/21	120	-	-	-	-	3,134,061	348,229	3,134,061	348,229	$3,482,290
CRM / Contact Center	GBE- Customer Engagement			G2101	6/1/20	120	15,200,000	800,000	3,800,000	200,000	-	-	19,000,000	1,000,000	$20,000,000
Customer & Employee Journey Mobilization	GBE- Customer Engagement			G2101			-	-	-	-	-	-	-	-	$0
Customer Experience Program Leadership - 1	GBE- Customer Engagement			G2101	3/1/19	120	260,229	780,687	-	-	-	-	260,229	780,687	$1,040,916
Customer Experience Program Leadership - 2	GBE- Customer Engagement			G2101	3/1/20	120	-	-	266,277	798,831	-	-	266,277	798,831	$1,065,108
Customer Experience Program Leadership - 3	GBE- Customer Engagement			G2101	3/1/21	120	-	-	-	-	203,177	609,513	203,177	609,513	$812,690
Customer Interaction - First Release	GBE- Customer Engagement			G2101	10/1/19	120	1,780,471	93,709	3,016,074	158,741	-	-	4,796,546	252,450	$5,048,995
Customer Interaction - Second Release	GBE- Customer Engagement			G2101	1/1/21	120	-	-	-	-	2,010,254	105,803	2,010,254	105,803	$2,116,057
CxT Portal & Channel Management	GBE- Customer Engagement			G2101	6/1/19	120	6,679,688	351,563	5,195,313	273,438	-	-	11,875,000	625,000	$12,500,000
Data Cleansing Execution	GBE- Supply Chain			G2101			-	543,101	-	-	-	-	-	543,101	$543,101
Defined Data Cleansing Approach	GBE- Supply Chain			G2101			-	362,067	-	-	-	-	-	362,067	$362,067
Design & Estimating Process Stabilization	GBE- Asset Management												-	-	$0
Design (GWD), Estimating (CU), & Mobility	GBE- Asset Management			G2101	9/1/20	120	1,729,295	192,144	4,920,570	546,730	3,201,244	355,694	9,851,109	1,094,568	$10,945,677
EAM-FIN Integration	GBE- Asset Management			G2101	6/1/19	120	979,407	-	798,695	-	-	-	1,778,102	-	$1,778,102
Employee Support Interaction - First Release	GBE- Customer Engagement			G2101	10/1/19	120	3,871,396	203,758	4,082,735	214,881	-	-	7,954,131	418,638	$8,372,769
Employee Support Interaction - Second Release	GBE- Customer Engagement			G2101	7/1/20	120	-	-	-	-	292,791	15,410	292,791	15,410	$308,201
Enhancements	GBE- Asset Management			G2101	12/1/18	120	600,945	31,629	-	-	-	-	600,945	31,629	$632,574
Future State Culture Definition	GBE- Business Enablement			G2101			-	-	-	-	-	-	-	-	$0
GIS (GWD/CU) - PPM Integration	GBE- Asset Management			G2101	12/1/20	120	-	-	-	-	844,849	-	844,849	-	$844,849
Integrated Supply Feasibility Assessment	GBE- Supply Chain			G2101			-	260,211	-	-	-	-	-	260,211	$260,211
Inventory Optimization	GBE- Supply Chain			G2101			-	677,174	-	-	-	-	-	677,174	$677,174
Inventory Strategy	GBE- Supply Chain			G2101			-	406,304	-	-	-	-	-	406,304	$406,304
Knowledge Transition & Collaboration Strategy	GBE- Business Enablement			G2101			-	613,243	-	-	-	-	-	613,243	$613,243
Labor Contract Strategy & Implementation Support	GBE- Business Enablement			G2101			-	76,353	-	78,455	-	80,616	-	235,424	$235,424
Large Commercial & Landlord Interaction	GBE- Customer Engagement			G2101	7/1/20	120	15,723	828	19,653	1,034	1,411,132	74,270	1,446,508	76,132	$1,522,640
Leadership Capability Development	GBE- Business Enablement			G2101			-	1,566,624	-	169,949	-	-	-	1,736,574	$1,736,574
Maintenance & Inspection Planning	GBE- Supply Chain			G2101			-	788,068	-	-	-	-	-	788,068	$788,068
Networking Transportation & Optimization Analysis	GBE- Supply Chain			G2101			-	1,083,478	-	-	-	-	-	1,083,478	$1,083,478
Networking Transportation & Optimization Implementation	GBE- Supply Chain			G2101			-	1,083,478	-	-	-	-	-	1,083,478	$1,083,478
Operations Performance, Governance & Value Realization	GBE- Business Enablement			G2101			-	1,022,926	-	227,732	-	173,348	-	1,424,006	$1,424,006
Program and Project Management Planning	GBE- Supply Chain			G2101			-	788,068	-	-	-	-	-	788,068	$788,068
Program Business Readiness	GBE- Business Enablement			G2101			-	1,232,927	-	1,126,682	-	464,574	-	2,824,183	$2,824,183
Program Business Sustainment - 1	GBE- Business Enablement			G2101	3/1/19	120	69,617	208,850	-	-	-	-	69,617	208,850	$278,467
Program Business Sustainment - 2	GBE- Business Enablement			G2101	3/1/21	120	-	-	-	-	221,771	665,312	221,771	665,312	$887,083
Program Business Sustainment - 3	GBE- Business Enablement												-	-	$0
Program Business Sustainment - 4	GBE- Business Enablement												-	-	$0
Program Learning Management - 1	GBE- Business Enablement			G2101	3/1/18	120	-	-	-	-	-	-	-	-	$0
Program Learning Management - 2	GBE- Business Enablement			G2101	3/1/19	120	130,211	390,632	-	-	-	-	130,211	390,632	$520,843
Program Learning Management - 3	GBE- Business Enablement			G2101	3/1/20	120	-	-	173,060	519,181	-	-	173,060	519,181	$692,241
Program Learning Management - 4	GBE- Business Enablement			G2101	3/1/21	120	-	-	-	-	195,721	587,163	195,721	587,163	$782,883
Program Learning Management - 5	GBE- Business Enablement												-	-	$0
Program Learning Management - 6	GBE- Business Enablement												-	-	$0
Program Transformational Change Office - 2	GBE- Business Enablement			G2101	3/1/19	120	1,516,310	2,642,422	-	-	-	-	1,516,310	2,642,422	$4,158,731
Program Transformational Change Office - 1	GBE- Business Enablement			G2101	3/1/18	120	-	-	-	-	-	-	-	-	$0
Program Transformational Change Office - 3	GBE- Business Enablement			G2101	3/1/20	120	-	-	368,704	1,805,991	-	-	368,704	1,805,991	$2,174,695
Program Transformational Change Office - 4	GBE- Business Enablement			G2101	3/1/21	120	-	-	-	-	169,648	678,006	169,648	678,006	$847,655
Program Transformational Change Office - 5	GBE- Business Enablement												-	-	$0
Program Transformational Change Office - 6	GBE- Business Enablement												-	-	$0
Regulatory Compliance	GBE- Regulatory and Compliance			G2101	9/1/19	120	1,500,000	9,000,000	750,000	6,350,000	-	500,000	2,250,000	15,850,000	$18,100,000
SAP and Application Integration Development- Release 1-1	GBE- Information Services Enabling			G2101	3/1/18	120	-	-	-	-	-	-	-	-	$0
SAP and Application Integration Development- Release 1-2	GBE- Information Services Enabling			G2101	3/1/19	120	4,548,168	-	-	-	-	-	4,548,168	-	$4,548,168
SAP and Application Integration Development- Release 1-3	GBE- Information Services Enabling			G2101	3/1/20	120	-	-	600,000	-	-	-	600,000	-	$600,000
SAP and Application Integration Development- Release 1-4	GBE- Information Services Enabling			G2101	3/1/21	120	-	-	-	-	600,000	-	600,000	-	$600,000
SAP and Application Integration Development- Release 2-1	GBE- Information Services Enabling			G2101	3/1/19	120	5,055,712	-	-	-	-	-	5,055,712	-	$5,055,712
SAP and Application Integration Development- Release 2-2	GBE- Information Services Enabling			G2101	3/1/20	120	-	-	4,397,065	-	-	-	4,397,065	-	$4,397,065
SAP and Application Integration Development- Release 3-1	GBE- Information Services Enabling			G2101	3/1/20	120	-	-	85,915	-	-	-	85,915	-	$85,915
SAP and Application Integration Development- Release 3-2	GBE- Information Services Enabling			G2101	3/1/21	120	-	-	-	-	2,326,606	-	2,326,606	-	$2,326,606
SAP and Application Integration Development- Release 3-3	GBE- Information Services Enabling												-	-	$0
SC - Business Architecture Design	GBE- Supply Chain			G2101			-	445,855	-	-	-	-	-	445,855	$445,855
Skills/ Capability Assessment & Curriculum Redesign	GBE- Business Enablement			G2101			-	556,933	-	171,590	-	-	-	728,523	$728,523
Supply Chain Program Leadership	GBE- Supply Chain			G2101	3/1/19	120	565,045	1,695,136	-	-	-	-	565,045	1,695,136	$2,260,181
Supply Chain Program Leadership	GBE- Supply Chain			G2101	3/1/20	120	-	-	235,258	705,773	-	-	235,258	705,773	$941,031
Use Case No.1 - Asset Risk	GBE- Asset Management			G2101	3/1/21	120	-	-	-	-	3,591,031	189,002	3,591,031	189,002	$3,780,033
Warehousing Optimization	GBE- Supply Chain			G2101			-	406,304	-	-	-	-	-	406,304	$406,304
WMFE Optimization	GBE- Work Management			G2101	3/1/22	120	-	-	346,828	38,536	2,984,574	331,619	3,331,402	370,156	$3,701,558
Work Forecasting & Planning - solution	GBE- Work Management			G2101	5/1/21	120	-	-	-	-	1,708,505	189,834	1,708,505	189,834	$1,898,339
Workforce Strategy Planning & Implementation Support	GBE- Business Enablement			G2101			-	784,576	-	176,171	-	58,938	-	1,019,685	$1,019,685
							44,502,215	31,626,033	29,056,147	14,523,187	27,048,653	5,698,650	**100,607,015**	**51,847,870**	**152,454,885**

Enhanced GBE Capabilities ($,000s)

	FY19	FY20	FY21	Total
CAPEX	**$44,502**	**$29,056**	**$27,049**	**$100,607**
OPEX	**$31,626**	**$14,523**	**$5,699**	**$51,848**
Total	**$76,128**	**$43,579**	**$32,747**	**$152,455**

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Asset Analytics Integration	AIPM	12/31/2020	Prioritize asset investments according to various risk factors including asset risk. A strong emphasis is on utilizing Asset Analytics for determining asset risk. Monetize asset risk in the form of amount of asset risk units mitigated per dollar of asset investment Provide a view current levels of asset risk and future levels of asset risk after asset investment
EAM-FIN Integration	AIPM	6/30/2019	Integrate with the EAM so that the asset hierarchy in EAM is referenced in Asset Investment Planning Tool (AIPM). This will allow for updates to the asset hierarchy in EAM to automatically be reflected in AIPM. Asset risk and prioritization can now be tracked at the asset level. Full functionality of asset risk is enabled once Asset Analytics is in place Integrate with FIN to obtain actual project cost (as constructed). This shall inform deferral/accelerate decisions of future work in the Annual Work Plan. Run reports which identify projects outside of budget and schedule tolerances and take corrective action. Also evaluate variance of Construction Grade estimate versus As Constructed values. Design and deploy Level 4 (L4) business processes, governance, and policies Training on process and technology enhancements
Enhancements	AIPM	12/31/2018	Example enhancements include the following: Setting up multi-year programs and associated projects Establishing a Stage-Gate approval process including Project Initiation Form (PIF) fields for each stage gate Defining an approval hierarchy and automating the approval process through alerts or email notification Provide the ability to evaluate different investment options and evaluate CapEx and OpEx tradeoffs Forecast blanket work including emergency work, customer growth, muni/city/state requests based on historical/projected data and to establish placeholder annual blanket budgets. Identify opportunities for bundling projects based on asset type, geography, asset risk factor, category (growth, end-of-life maintenance capital, regulatory driven, mandatory, non-mandatory, O&M, etc.), etc. Create separate 'portfolio views' of the work container (e.g., by geography/ cost center, by category, by asset class, by stage gate approval, by work type (growth, end-of-life, refurbishment, maintenance, etc.)) Store multiple scenarios of the proposed Annual Work Plan. Variables within the scenarios shall include a different mix of projects which focus on different strategic objectives, different funding amounts, and sensitivity analysis related to risk. Develop rolling multi-year repair vs. replace vs. run to failure vs. maintain decision process Design and deploy Level 4 (L4) business processes, governance, and policies Training on process and technology enhancements
GIS (GWD/CU) - PPM Integration	AIPM	12/1/2020	Accept inputs on project estimates from the GWD/CU and CAD/ESW library Equate project estimate inputs into resources (people, material, and equipment) needs Enhanced bundling capability to spatially visualize project location and to bundle projects based on their location (and unbundle) Incorporate work volumes tied with financials for the 5-10 year plan (maintenance and capital work) for both project and blanket estimates (e.g. emergency work budgets, corporate requests with changes in spend/budget, maintenance program, etc.). Integrate with PPM to proactively understand potential project overrun issues in advance and take corrective action. Utilize Earned Value (EV), Estimate to Complete (ETC), Estimate at Completion (EAC), Budget Variance (BV), Schedule Variance (SV), etc. Optimize the investment plan under resource (labor, equipment, materials, etc.), financial (CapEx and OpEx), regulatory and network constraints and to identify and compare trade offs between investment options, including but not limited to risk reduction, cost, and resource use Ability to translate projects into supply/demand forecasts for resources (people, material, and equipment) and to communicate the information (taking into account that the granularity of the resource supply/demand is limited to the granularity of the estimate provided to the tool)
AM Program Leadership	AM Program Leadership	THROUGHOUT THE PROGRAM	Includes the program leader and supporting management team to lead and support the Asset Management work stream throughout its lifecycle, including establishment of direction and priorities, program oversight to insure delivery of scope within established budget, schedule and quality requirements, and issue and risk management Supports cross-portfolio integration and provides input and recommendations to the Portfolio Leadership Team as appropriate

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Use Case No.1 - Asset Risk	Asset - Advanced Analytics	3/1/2021	Provide the capability to aggregate multiple data sources of asset demographic, condition, health, and other information to provide a consolidated view of asset risk within and across asset classes. Provide the ability to view asset risk geospatially. Include the feature to have slide bars for a date range to overlay the planned improvements to mitigate the asset risk. This shall allow Asset Managers to better bundle and coordinate outages/customer interruption
Customer Experience Program Leadership	Customer Experience Program Leadership	THROUGHOUT THE PROGRAM	Proactive management and identification of dependencies across moduleModules and individual projects with the Customer Experience (CE) Module Project Management for the Customer Engagement Module including risk, issue, scope, schedule, budget management Stakeholder management with customer-facing organizations within CE Module affected lines of business/business units
Customer Interaction	Customer Interaction	NMPC RELEASE 1 = APRIL 2019, RELEASE 2 = JUNE 2020 , PROGRAM OCTOBER 2019, SEPTEMBER 2020	This initiative will implement several interactive support tools to enable simple and effective interactions with National Grid. It will provide Customers (Existing and Prospect) information they need to live their lives and be in control. It will provide Customers information about field activities as needed to deliver an effortless customer experience digitally. Part 1 Enhance core customer community foundation including login, registration and general UI / UX enhancements Part 2 Customers can: Find information about how to establish a gas service, the cost for the service (i.e., CIAC – using existing calculation methods) and apply for it on National Grid's website (CxT) or user's mobile device via web browser Schedule appointments with National Grid on their own terms to my home or business – and can change appointments to better fit their schedule Get reminders from National Grid about appointments and other activities (Should be similar to other reminders that the customer receives, such as billing reminders) – leveraging CxT technology Submit photos to National Grid, e.g. of my meter or problems at my premise Follow up on progress of my requests / appointments and view status Enter preferences for how to be contacted and how to interact with National Grid for use with CxT notification mechanism find out if crews are working in the vicinity
CxT Portal & Channel Management	Customer Interaction	PROGRAM = JUNE 2019.	implement foundational infrastructure to allow : Responsive web design leverage a web content management system send data through a Middleware to allow for a consistent message and appearance to customers Ability to enable mobile actions Ability to leverage Identity Access functionality for customers without a single sign on channel preference management; capturing how customers want to be communicated with
Large Commercial & Landlord Interaction	Customer Interaction	7/1/2020	Commercial & Property owners can: Bundle appointments together to help manage their time effectively, and can change them as needed to any schedule changes View status and progress of requests / appointments Delegate communication and interaction preferences (e.g., delegate point of contact for each of the properties) Submit pictures of e.g. meters on the property Find information about how to establish gas service, the cost for the service, and apply for it on National Grid's website or access web browser using mobile device Get information for things that are available, such as the LOFL (Leave on for Landlord) Receive notifications/alerts about an issue at one of my premises – leverage CxT technology Find out if there are crews working in the vicinity

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Complex Design (CAD) & Estimating (ESW)	Engineering, Design, Estimating & Mobility	3/1/2021	Design Tool implementation Implement a full set of computer aided design (CAD) tools. This will include office tools for complex designs as well as field sketch and estimating tools. Complex design templates and processes will be developed and implemented across the enterprise and the estimating software will be integrated for more consistent and accurate designs and estimates. Components will include: Develop and implement design processes that address allocation of work to Designers, greater communication with Field Engineers and more efficiency utilizing office-based design and reference tools. Standardize on a set of engineering tools, SOPs, standards and practices to be used across operating companies Standardize on a common CAD software. Train new users and upgrade existing users. Determine performance KPIs and metrics as well as a post-construction feedback loop for better accountability and continuous improvement.
Design & Estimating Process Stabilization	Engineering, Design, Estimating & Mobility	PROGRAM = SEPTEMBER 2020	Design & Estimating Process Stabilization Provide on-going support for Engineers following the introduction of: Graphical work design (GWD) and estimated with compatible units (CUs). CADand estimated with estimating software (ESW).
Design (GWD), Estimating (CU), & Mobility	Engineering, Design, Estimating & Mobility	9/1/2020	Design Tool implementation Implement a full set of Graphic Work Design (GWD) tools. This will include office tools for standard designs as well as field sketch and estimating tools. Standard design templates and processes will be developed and implemented across the enterprise and the CU library will be integrated for more consistent and accurate designs and estimates. Components will include: Develop and implement the Stage Gate Approval process Develop and implement design processes that address allocation of work to Designers, greater communication with Field Engineers and more efficiency utilizing office-based design and reference tools. Standardize on a set of engineering tools, SOPs, standards and practices to be used across operating companies Deploy GWD within GIS where the GIS is utilizing an updated landbase and conflated assets. Determine performance KPIs and metrics as well as a post-construction feedback loop for better accountability and continuous improvement. Mobility Expand the mobile capabilities implemented in Release 1 for greater effectiveness in the Design and Estimating arena. The following components are included: Allow for electronic policies, standards and procedures which can be updated in real-time with updates pushed to field users Ability to field verify designs and update as-builts in the field through mobile technology. This includes mobile redlining as well as updating a restricted set of GIS and EAM attributes. Design and implement mobile technology for the design and estimating process to include field sketching and estimating. Coordinate with EAM/WM mobile technology design/implementation. People Evaluate the balance between centralized/regionalized Engineering resources and the connection to Field Engineering Develop newly defined and updated roles and responsibilities to execute the new business processes and utilize the new technology as well as better execution of non-design work (e.g., permits, mapping, etc.) Establish an Estimating Center of Excellence (ECoE) to manage/update the CU library and interface with Supply Chain on material codes. Identify the responsibility of Engineers doing estimates within their Engineering group versus the ECoE as curators of the estimating process and CU library. Develop a training program to help improve the quality and effectiveness of Design and Estimation resources

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Construction Planning	Integrated Supply & Demand Planning	SC INTEGRATION IN NMPC JUNE 2020, PROGRAM = SEPTEMBER 2020	Design supply plan database Collect supply data by gathering large projects plans and budgets Confirm demand drivers Determine the projects vs portfolio mix Develop demand plan by conducting interviews and analyzing project plans Validate and revise demand plan with stakeholders Publish demand plan to stakeholders Develop revision and recurring meeting processes Transfer knowledge to new demand plan owners Support early revisions to ensure smooth transition
Maintenance & Inspection Planning	Integrated Supply & Demand Planning	SC INTEGRATION IN NMPC JUNE 2020, PROGRAM = SEPTEMBER 2020	Design supply plan database Collect supply data by gathering maintenance plans, existing contracts, budgets, and other sources of information from concerned lines of business Develop demand plan by conducting interviews and discussing demand drivers Validate and revise demand plan with Stakeholders Publish demand plan to SC stakeholders Develop revision and recurring meeting processes Transfer knowledge to new demand plan owners Support early revisions to ensure smooth transition
Program and Project Management Planning	Integrated Supply & Demand Planning	SC INTEGRATION IN NMPC JUNE 2020, PROGRAM = SEPTEMBER 2020	Design supply plan database Collect supply data by gathering large projects and program plans and budgets Confirm demand drivers Determine the projects vs portfolio mix Develop demand plan by conducting interviews and analyzing project plans Validate and revise demand plan with stakeholders Publish demand plan to stakeholders Develop revision and recurring meeting processes Transfer knowledge to new demand plan owners Support early revisions to ensure smooth transition
Integrated Supply Feasibility Assessment	Integrated Supply Feasibility Evaluation and Strategy	SEPTEMBER 20 TO APRIL 2021 IS WHEN OPTIMIZATION IS APPLIED PROGRAM WIDE	The work will determine supplier spend segmentation across receiving locations (warehouse, barns, sites) and suppliers to assess current program scope, gaps in service, and optimum program setup. Detailed transactional analyses, labor analyses, and inventory assessments will be combined with site visits and negotiations in order to improve total cost of ownership. Evaluate capabilities Gas Operations will need from an Integrated Supply provider Understand the potential benefits and challenges, and develop a strategy for a feasible Integrated Supply solution Propose industry best practices in the priority areas of Safety, Operational Excellence, Customer Satisfaction and Emergency Preparedness Establish a detailed, clear plan to transition project outcomes to Shaping our Future In coordination with the Gas Operations Program and Project Management (release 1 and release 2), implement a process to integrate the demand of Projects and Programs needs with Supply Chain materials. This initiative will create a 'first cut' demand plan for the large programs and projects by collecting data from various sources and consolidating them into usable format for analysis while contributing to any requirements for the implementation of work management planning tools (e.g.; Primavera). This will provide an initial view of Program and Project Management material and services requirements for use in decision making.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Inventory Optimization	Inventory Optimization	SEPTEMBER 20 TO APRIL 2021 IS WHEN OPTIMIZATION IS APPLIED PROGRAM WIDE	The Inventory Optimization initiative will ensure that Gas Operations has the right inventory at the right time to complete the job. This initiative will analyze current inventory then develop and execute improvement opportunities for ensuring desired material availability while reducing excess inventory. The team will perform a deep data analysis, identify root causes of inventory problems, highlight gaps, and develop policies & procedures, performance metrics, and reports for effective inventory usage across the organization. Specific focus will be given to management of critical spares and inventory positioning. Prepare for analysis and align with all relevant stakeholders Obtain existing KPI repository and establish performance baseline; Data review and cleansing Review and Analyze Inventory Determine inventory classes Analyze inventory usage, excess and obsolescence Identify target inventory by Positioning location and by "Spare" classification Identify root cause and prioritize opportunities Define problem areas/functions, capability gaps, mitigate potential design issues Analyze current state against industry best practices Perform feasibility analysis and highlight priorities for implementation (quick wins, strategic implementations, etc.) Recommend improvement opportunities Develop performance management framework, metric scorecard and tracking parameters Create reports Inventory policy design Design stocking and usage policies for each class; Design optimal stocking and reordering levels for each class Pilot design in chosen geographies Develop deliverables Supply Chain organization Inventory Policy Inventory Performance Metrics scorecard Implementation Plan for Inventory Criteria and Parameters Recommendations on Inventory Levels
Inventory Strategy	Inventory Optimization	SEPTEMBER 20 TO APRIL 2021 IS WHEN OPTIMIZATION IS APPLIED PROGRAM WIDE	Analyze and define foundational inventory framework Determine service levels, item segmentation, critical spares Develop plan for enabling inventory structure Determine stock vs. buy decisions, sourcing strategy (use commercial vendor, e.g. Home Depot, for basic items rather than stocking them
Business Architecture - Organization Design & Transition	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Business Architecture Organization Design and Transition Initiative will conduct an organizational diagnostic, including span-of-control analysis, retirement and attrition analysis, and role title rationalization; define the detailed organization structure (L1-L3) including role descriptions and accountabilities in alignment with the new operating model; and work with Human Resources to facilitate the transition of employees into the new organization structure. The organization transition will begin with a pilot in one state to enable measured incremental improvements in operations performance before fully deploying new roles to the entire organization. For example, dependent on the future-state Operating Model, this Initiative would facilitate the identification of Process Owners, defining the specific expectations for the role and working with Human Resources to align expectations This Initiative would also facilitate the orderly transition of employees into new roles.
Future State Culture Definition	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Future State Culture Definition Initiative will define the desired to-be cultural attributes of the U.S. Gas Business, including values, beliefs and observable behaviors (e.g. accountability, agility and customer centricity). This Initiative is scheduled early in the Program and will provide a foundational input to many other Initiatives that will reinforce the values, beliefs and observable behaviors. For example, the Leadership Capability Development Initiative will introduce the future-state culture to the top, mid-level and front-line leaders across the U.S. Gas Business. These leaders will then introduce these attributes to their teams. The attributes will then be embedded into and reinforced through Initiative-level Agile change, communication and training activities.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Leadership Capability Development	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Leadership Capability Development Initiative will focus on building the leadership capabilities in the top 100, mid-level and front-line leaders necessary to lead their teams through the changes being implemented via the Gas Business Enablement Program to achieve the required levels of performance while reinforcing the future-state cultural attributes. During an initial strategy phase, this Initiative will define a leadership curriculum for each of the three leadership groups, working closely with Human Resources to build on existing leadership development Initiatives, such as the supervisor enablement pilot.
Operations Performance, Governance & Value Realization	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Operations Performance, Governance and Value Realization Initiative will define the baseline business case and develop a value framework and ownership model to drive sustained governance and performance. Building on the business case developed during the Strategic Assessment phase, this Initiative will establish the business case governance and value realization processes, including a detailed baseline of key performance metrics across workgroups and states in order to determine the underlying levels of performance necessary to achieve the business case and the associated performance gap between current and future-state. The Initiative will then define and implement a Performance Management Framework (e.g., performance scorecards, data quality scorecard, review and refresh key business scorecards,, sustainment) and align with Strategic Planning (e.g., growth playbook, strategy refresh / annual strategy refresh assessing 6 priority areas/programs and next steps).
Skills/ Capability Assessment & Curriculum Redesign	Operating Model & Value Framework	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Skills / Capability Assessment and Curriculum Redesign Initiative will identify current skills, capabilities and gaps for learning development and augmentation. Recognition of skill gaps that will emerge over time as existing workforce demographics shift implies a need for increased mastery of new employees as well as existing employees as roles and capability needs shift with emerging and more complex work and advanced technologies
Knowledge Transition & Collaboration Strategy	Program Business Readiness & Sustainment	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Knowledge Transition and Collaboration Strategy initiative will assess the landscape and future needs to facilitate knowledge transfer and promote collaboration across the business. The assessment would include a roadmap that spans across the business. This would entail: Objectives, Metrics, Processes, Technologies, Organization, Governance
Program Business Readiness	Program Business Readiness & Sustainment	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Business Readiness Initiative is a program level function which focuses on coordinating business readiness activities across the Gas Business Enablement program. Managed via the Program Transformational Change Office, the team will serve as the primary liaison between the Program team and business leadership. Early in the Program, key activities include helping business leadership understand the scope and timing of the changes, the impact to each organization, business resource requirements to support the Program and the development of Readiness Action Plans that demonstrate business ownership of the outcomes. For example, in any Program, it is critical that business leadership understands what the Program will provide, the questions that it will answer, and just as important, the related questions that the Program will not answer and that the business needs to anticipate and plan to answer in order to be successful. As capabilities start to be released into the organization, the Business Readiness team would then work closely with deployment teams and Initiative-level Agile change management and training efforts to assess readiness and facilitate go-live decisions
Program Business Sustainment	Program Business Readiness & Sustainment	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Business Sustainment Initiative is structured into two releases to define and implement the necessary roles, teams and processes to sustain the capabilities deployed during the Gas Business Enablement Program. Release 1 defines an initial strategy mid-way through the Program that will serve as an input to other GBE Initiatives to “design with the end in mind”. Release 2 is scheduled late in the Program timeline to design and implement the roles, teams and processes. This Initiative is not intended to bear the entire burden of sustaining capabilities and value. Sustaining the changes implemented during the Gas Business Enablement Program will require much more than just implementing roles, teams and processes, it will require the coordination across multiple Initiatives, including Organization Transition, Future-state Culture, Program Learning Strategy, Leadership Capability Development, Data Management, etc.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Change Management COE Development & Implementation	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Agile Change Management CoE Strategy initiative will establish a Change Management CoE as part of a long term capability within the organization. This would entail: **Centralized**, skilled team to manage and monitor change management activities across the business leveraging budget, time and resource availability **Dedicated** single point of contact to support Projects and Business Function teams' business needs **Standardized** operating model, processes, tools and templates to efficiently and consistently support Projects and Business Functions in all change management activities **Integrated** cross business function and project methods / deliverables (e.g. impact analysis, overall work plans, communications, training) to streamline work effort and expedite Implementation at the impacted, end-user level **Centralized** program management and governance approach for issue tracking, status reporting and measuring change effectiveness
Labor Contract Strategy & Implementation Support	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	Similar to the Workforce Strategy Initiative, the Labor Strategy Initiative will coordinate with the Process Design Initiative to document potential labor impacts, assess the impacts vs. existing bargaining unit contracts, and coordinate with Labor Relations to define an overall labor contract strategy, including a detailed contract review to determine which impacts will require negotiated changes. The resulting labor strategy will include a timeline of key changes to be implemented by the program, an assessment of which contracts will be impacted by the changes, key dependencies, and a recommended negotiation strategy and timeline. After the initial strategy development, Labor Relations will own the Labor Strategy, coordinating with the Program Transformational Change Office and individual Initiatives to execute the strategy. Annually, the Program will work with Labor Relations to refresh the Labor Strategy based on the latest developments.
Program Learning Management	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Learning Management Initiative operates in concert with the Transformational Change Office to define the overall Program Learning Strategy; serve as the primary interface between the Program and National Grid's Learning &Development organization to coordinate learning standards, facility, infrastructure and support needs; and coordinate standard, consistent leading approaches to learning across all technology / process Initiatives. Following the strategy release, the Program Learning Management Initiative shifts to serve a learning solution architect and coordination role, ensuring that standards and leading practices are being uniformly adopted across Initiatives, especially with regard to Agile learning approaches. In Release 3, the Program Learning Management Initiative shifts focus once more toward ensuring the sustainability of the Program Learning content and capabilities.
Program Transformational Change Office	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Program Transformational Change Office is a program-level function which focuses on enablement, coordination and standardization in collaboration with Initiatives across the Program portfolio of Initiatives. The Office defines and manages the overall Change Architecture of the Program, ensuring the intended end-to-end linkages between Initiatives and leveraging analytics, such as Organizational Health Analytics, to chart the course, define tailored interventions for each workgroup and state and drive leadership engagement and alignment across the Program. The Office would also develop and maintain a Program-level communication plan to engage and align all Stakeholder, both internal and external. The Office would also maintain a change intensity heat map as a tool to manage the overall changes, highlighting when and how various workgroups are impacted by GBE and non-GBE Initiatives (e.g. Shaping our Future) to manage the overall changes being deployed to the U.S. Gas Business.
Workforce Strategy Planning & Implementation Support	Program Level People Strategy	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	The Workforce Strategy Initiative will coordinate with the Process Design Initiative to expand on the Change Impacts collected during the Strategic Assessment Phase, with a focus on key changes that will impact the volume of work; required capabilities, skills & experience; and new or significantly changed roles. The Workforce Strategy will closely integrate with the Labor Strategy Initiative, and will work closely with Human Resources and Labor Relations to develop an overall workforce strategy for the U.S. Gas Business. The workforce strategy will forecast FTE requirements over the duration of the GBE Program as capabilities are released, highlighting where workforces are expected to increase, decrease, or experience significant changes that would impact recruiting and talent development. The workforce strategy would also specifically outline how the Program will work with Human Resources over the duration of the Program to facilitate the workforce changes, including role / job descriptions, grading, posting, recruiting, etc. After the initial strategy development, Human Resources will own the Workforce Strategy, coordinating with the Program Transformational Change Office, the Business Architecture – Organization Transition and individual Initiatives to execute the strategy. Annually, the Program will work with Human Resources to refresh the Workforce Strategy based on the Program schedule, capabilities released to date, and anticipated changes over the next 9-12 months.

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Core Projects & Program Management	Projects & Program Management	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	Implement Project Management platform specifically focused on scheduled/long cycle work (projects/programs) with the following capabilities: Planning & Scheduling; Resource Management & Capacity Planning; Earned Value Management; Risk & Issue Management; Project collaboration (design review, meeting minutes, action items); Funding / budgeting / forecasting; Management of Change; Permit management; Emergent work tracking; Commissioning Develop standard work procedures, KPI's, metrics, and targets Develop templates and forms as necessary Define processes to be automated and the design of workflows or methods to automate Conversion of project data Develop detailed implementation and training plans for end users
Regulatory/ Compliance	Regulatory/ Compliance	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	standards operating procedures documentation, document management and technical training Improves electronic field data capture with prompts and controls developed within the solution to drive accurate and complete capture of required information, and will enhance records to document compliance with less reliance on paper Improves field access to customer and asset data with enhanced visibility utilizing maps and process documentation on mobile devices to provide employees with the right information to comply with regulatory requirements Improved training and job aids such as instructor and video-based training on mobile devices to improve operational performance
SAP and Application Integration Development- Release 1	Remediation & Integration	PROGRAM DATE = SEPTEMBER 2020	SAP and Application Integration Integrations (across EAM Solution, Resource Management, and Mobility) that leverage Comprehensive Integration Services and potential Mobility Platform Integration Framework. Integrations for applications that remain in portfolio, such as: Irthnet, Powerplan via SAP, E-Permits, GridForce, System Operating Procedures, SAP Systems (Multiple Modules), PCS – Corrosion Bass Trigon, etc. Align interface development for Primevera to EAM and Work Management; Develop integrations for associated applications. Application changes in SAP and Legacy Applications that will remain in the portfolio, to allow interface adapters, or batch jobs to take in new integrations as appropriate. Develop GIS and mobile GIS application integration for Mobile Platform; include populating mobile platform repository
SC - Business Architecture Design	SC - Business Architecture Design	PER SOW, SC PROGRAM DATE = OCTOBER 2019	Focus on standardizing and improving the policy, procedures and processes that have the most direct impact to Gas Operations. By creating and implementing standards, the integration cost and efforts for work and asset management to integrate to Supply Chain will be reduced. In addition, increase internal Gas Operations customer experience will be improved given the clarity around roles and responsibilities. Refine Supply Chain process hierarchy based on the to-be Supply Chain operating model. Refine and implement the new policies. Refine and implement the to-be processes, including interim processes as required to support transition to the to-be operating model. Provide support across projects to integrate and coordinate process development, documentation and implementation.
Customer & Employee Journey Mobilization	Structured Experiences	PROGRAM DIAGNOSTIC WORK OCCURS BY DECEMBER 2017 BUT CONTINUES THROUGHOUT PROGRAM	This initiative will leverage the Customer Journeys developed by the CxT program and other previous initiatives, and refine them as needed to articulate the future vision of GBE focused on the customer experience. In addition, this initiative will develop corresponding Employee Journeys articulating the future Employee experience required to deliver the GBE Customer Experience. The key outcome from this Initiative is agreement from all aspects of the business that these Journeys are the desired state and will guide project development over the course of the GBE program. A Customer Center of Excellence will be established to serve as the governing body for any Customer impacting decisions / initiatives. This includes defining the organizational structure for who ultimately is accountable for and owns the delivery of the Customer Experience, and the supporting organization.
Data Cleansing Execution	Supply Chain Master Data Improvements	PROGRAM = OCTOBER 2019	Data Cleansing Execution Update taxonomy on material master Identification of duplicate records Removal of duplicates from material and vendor masters Master data enrichment as per the agreed taxonomy and standards Establish KPIs related to master data request process Provide content for updating business process documentation and training to assist in maintaining the quality of data during create/change/flag for deletion processes

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Defined Data Cleansing Approach	Supply Chain Master Data Improvements	PROGRAM = DECEMBER 2017	Define Data Cleansing Approach Define actions to perform related to the material and vendor master request process Define taxonomy, standards and data dictionary Conduct data quality analysis Identify master data super users within design, engineering, and warehouse Gas Operations
Supply Chain Program Leadership	Supply Chain Program Leadership	THROUGHOUT THE PROGRAM	Feasibility Evaluation and Strategy Understand current lifecycle processes Define basket of materials and services within scope Conduct 2 - 4 peer utility interviews & plan best practice utility visits Develop integrated supply model with high level process definitions, define savings models Develop integrated supply business case Determine go-forward materials fulfillment model Finalize integrated supply strategy Develop Deliverables To-be Fulfillment Model In-scope Market Basket of Materials Business Case
CRM / Contact Center	Support Interaction	6/1/2020	Contact Center Front End Solution Provide a platform to handle customer interactions including: Establishing service Account inquiries including billing issues, service suspension, etc.. Payment arrangements Compliments / Complaints Move-in / Move-out Outage reporting In-application visibility to work management information (Gas/short cycle Electric) and appointment scheduling capability 360 degree view of the customer, providing visibility to customer touchpoints, interactions and account history in one place Drive call deflection through supporting digital channels such as email and web-chat and driving the customer community Improve key metrics including but not limited to: first call close, average handle time, abandonment rate, and occupancy rate. Enhanced analytics and in-app reporting and dashboards to more effectively drive the business Create opportunities to collaborate internally across the organization to more effectively service customers

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Employee Support Interaction	Support Interaction	PROGRAM RELEASE 1 = OCTOBER 2019, RELEASE 2 = JULY 2020	This initiative will implement an interactive support tool to enable effective interactions by National Grid employees with Customers. It will provide all Internal National Grid Employees information about field activities required to better serve National Grid's customers. It will also a provide the Field Crew (including Contractors) with information about the Customers to make it easy to help them National Grid Employees can: Help customers when they contact us with questions about establishing new service, provide a quote, and help sign up the customer for service Schedule customer appointments that work for them and us View status and progress of a customers request / appointments and provide accurate updates when customers ask Capture and view customer preferences for how to interact with us See where crews are (in the vicinity), so when the customers call and say "who is outside my window? I can provide an accurate answer Receive and view customer photos (e.g. of their meter) Notify Field on additional information needed next time they go to the customer Contact the field real time when they are on site with a customer (or vice versa) so that I can help better address the customer needs National Grid Field Employees can: Get notified of all the information we (National Grid) need before my visit to the customer, so they are ready to ask for and capture that information Have easy access to information about the Customer and will be prepared when they get to the site Effectively suggest products and services to the customers by receiving prompts on mobile device on what to recommend Send emails to the Customer with tailored information to help them (links to National Grid web pages) Provide field workers with an accurate and near "real-time" view of customer information via their mobile application. Enables transparency between the Contact Center and the Field employees. Field employees will be able to see customer data and be able to have a dialogue with the contact center agent via Chatter while on-site. Enables field employees to capture and update customer information while on-site.
Campaign Management	Supporting through Data	PROGRAM DECEMBER 2017, WITH ENHANCMENTS DECEMBER 2019	Proactive identification of prospective customers, creation of offers, tracking of offer take-up rate of products and services (e.g. Energy Efficiency products, budget billing, eBill, payment arrangements, sales/conversion of appliances)
Channel Analytics	Supporting through Data	PROGRAM DECEMBER 2017, WITH ENHANCMENTS DECEMBER 2019	Data should be able to capture: Are customers able to complete an interaction/transaction using the Customer Portal or do they go to another channel to complete the transaction? What is the % of transaction completion success per channel without having to switch channels? If a customer switched, in what moment of the transactions? Did the customer contact us again within 48 hours? etc.. Is the Field Crew able to complete an interaction/transaction with the customers as intended or do they end up referring to the call center (instead of directing the customer to digital solutions as designed)?

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
Networking Transportation & Optimization Analysis	Warehousing and Network Optimization	PROGRAM = JULY 2020	Network Optimization Analysis Validate current and future demand and service levels Define clear scenarios Validate network baseline Analyze warehouses/distribution centers for overall number required, optimal location, ideal sizes, and plan for scaling growth. Determine Benchmarks for distribution, warehousing and handling Refine distribution area to be delivered from each warehouse and to evaluate possible changes in warehouse locations to optimize the network Recommended ways to reduce variability and identified opportunities for cost reduction through production and mode shifts Develop Deliverables Summary of the Scenario Analysis Recommended network strategy Business case and implementation plan
Networking Transportation & Optimization Implementation	Warehousing and Network Optimization	PROGRAM = JULY 2020	Network Optimization Implementation (1 month Pilot in specific region with all below activities, followed by Full Implementation in all regions) Implemented change management structure “Quick wins" design and implementation Refined business case and performance tracking model Infrastructure development: design, build, test and migrate Re-design and/or re-tendering of Gas Operations Operating model roll-out
Warehousing Optimization	Warehousing and Network Optimization	PROGRAM = JULY 2020	Warehouse Optimization Organize inventory placement for maximum efficiency and remove material from work areas Review inventory receipt, storage, handling, and job preparation/packing/kitting processes Implement quality improvement program for increased performance and continuous improvement. Establish clear expectations and priorities based on value provided to Gas Operations and overall customer service Equip and enable the workforce for consistent execution Develop Deliverables Implementation Plan for improvement projects Formal Documentation for improved processes
WMFE Program Leadership	WMFE Program Leadership	THROUGHOUT THE PROGRAM	Includes the program leader and supporting management team to lead and support the WMFE work stream throughout its lifecycle including establishment of direction and priorities, program oversight to ensure delivery of scope within established budget, schedule and quality requirements, and issue and risk management Supports cross-portfolio integration

Enhanced Capabilities (including Technical Training) Investments			
Release	**Program**	**In Service (Program Date Provided Where NMPC Date TBD)**	**Potential Capability/Benefit**
WMFE Optimization	Work Management & Field Enablement	3/1/2022	This release is set up to implement additional capabilities of EAM and Field Mobility along with integration to Project Management system. User Group: Customer Meter Service Field (In-house & Contractor Field Crew, Field Supervisors, Contractor Oversight), Maintenance & Construction (In-house & Contractor Field Crew, Field Supervisors, Contractor Oversight), Work Support, Engineering, and Resource Planning Work Type(s): Include work types listed in release 1, 3 and 6 Implement integration with EAM, Project Management system Enhance EAM capabilities which include auto work notifications, link project info in Project Management system to work orders, job plans and PMs in EAM Enhance Supervisor field mobile with additional capabilities, which include view and track crew/work orders progress spatially and send notification to crews Implement additional field mobile capabilities including mobile red lining, GIS mobile mapping (i.e., integrated with Work Management app) Training on process and technology enhancements
Work Forecasting & Planning - solution	Work Management & Field Enablement	5/1/2021	Implement single, enterprise work forecasting & planning platform for all jurisdictions with the following capabilities: User Group: Resource Planning Implement integration with Project Management, EAM, and HR (People/User) systems Provide one global view of work and resources (internal and contract resources) Design and deploy business and decision-making processes, governance, and policies including divisional nuances to support continuous improvement Ability to forecast through a statistical analysis of historical data, adjusted to future factors that may impact predicted volumes (e.g. weather, marketing campaigns, billing events etc.) Ability to optimize forecast of work to resources Provide training on process and technology enhancements

Date of Request: July 27, 2017 Request No. DPS-688 AAM-39
Due Date: August 7, 2017 NMPC Req. No. NM-1360

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Allison Manz

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: **GBE FINANCING**

Request:

In these interrogatories, all requests for workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

The following questions refer to the Company's response to DPS-602:

1. Provide the stand-alone NMPC sensitivity analysis similar to what was provided in Attachment 4.

2. Provide a break out of the "traditional payment" amounts in the NMPC sensitivity analysis provided in response to the preceding question. Break out the payments between opex, amortization, and return.

3. In response to DPS-602(13), the Company stated that the third party option is not expected to affect the capitalization of the service company. Explain why not. As the Company is proposing to finance the project entirely with debt, why is the overall capitalization not affected?

4. How did the Company determine that a discount rate of 4.5% is appropriate?

5. Did the Company consider using other discount rates? If so, why were they not used in the analysis?

6. How would the Traditional Method versus TPO method be evaluated should interest rates (LIBOR+spread) increase and remain above the breakeven point? Would the Company still move forward with this financing option?

Response:

1. Please see tab "NMPC Sensitivity" in Attachment 1.

2. Please see tab "NMPC traditional breakout" in Attachment 1.

3. The third party option is not expected to affect the capitalization of the service company as the guarantor, National Grid USA, will hold the debt on its balance sheet.

4. To perform a net present cost analysis the Company considered a range of discount rates. The Company chose a 4.5% discount rate for this preliminary analysis because 4.5% was viewed as a conservative discount rate based on the average cost of debt. Using a discount rate based on the operating companies' pre-tax Weighted Average Cost of Capital ("WACCs"), averaging approximately 9%, would make the TPO look more favorable.

5. Please see the response to question 4 above.

6. The breakeven rate was determined by flexing the LIBOR rate such that the Net Present Cost ("NPC") of the third party option equaled the NPC of the fixed traditional NPC. If LIBOR were to increase, National Grid would expect the operating companies' WACCs to increase as both Cost of Debt and Cost of Equity are a function of market conditions.

   As explained in the Company's response to DPS-602 and in the Corrections and Updates testimony of the Revenue Requirements Panel, National Grid is continuing to perform its due diligence on the feasibility and viability of the third-party financing approach. While National Grid has conducted significant initial diligence, the effort is still in the early stages of determining the viability of financing options, products, and providers.

   The breakeven analysis is intended to illustrate the current breakeven based on the current range of indicative rates. Should, in the development stage of the product, the pricing go above the breakeven spread, National Grid would re-evaluate the feasibility and viability of the product.

Name of Respondent:
Jacqueline Woodhouse
Pamela Viapiano
Charles DeRosa
Johnny Johnston

Date of Reply:
August 7, 2017

NMPC Sensitivity

Assumptions

Financial year		Total	Units	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
Time period				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Traditional NMPC CFs																			
Traditional Payment (net)		**($93,841)**	**$'000**	**($4,754)**	**($12,342)**	**($11,546)**	**($9,832)**	**($8,619)**	**($7,123)**	**($6,633)**	**($6,329)**	**($6,060)**	**($5,801)**	**($5,525)**	**($4,599)**	**($2,924)**	**($1,357)**	**($395)**	**$0**
Traditional Payment (NPC)		**($72,442)**	***$'000***	**($4,549)**	**($11,302)**	**($10,118)**	**($8,245)**	**($6,916)**	**($5,470)**	**($4,874)**	**($4,450)**	**($4,078)**	**($3,736)**	**($3,405)**	**($2,712)**	**($1,650)**	**($733)**	**($204)**	**$0**
Third Party NMPC CFs																			
Fixed project costs		($77,515)	$'000	($131)	($1,884)	($4,314)	($6,084)	($7,288)	($7,777)	($7,796)	($7,796)	($7,796)	($7,796)	($7,665)	($5,874)	($3,201)	($1,583)	($508)	($20)
Interest costs	16.89%	($14,034)	$'000	$0	$0	$0	($2,060)	($2,235)	($2,095)	($1,845)	($1,587)	($1,328)	($1,070)	($811)	($557)	($360)	($68)	($17)	($1)
NMPC: Third Party Payment (net)		($91,549)	**$'000**	**($131)**	**($1,884)**	**($4,314)**	**($8,144)**	**($9,523)**	**($9,872)**	**($9,642)**	**($9,383)**	**($9,125)**	**($8,866)**	**($8,477)**	**($6,430)**	**($3,561)**	**($1,651)**	**($525)**	**($20)**
NMPC: Third Party Payment (NPC)		**($65,413)**	***$'000***	**($125)**	**($1,726)**	**($3,780)**	**($6,829)**	**($7,642)**	**($7,580)**	**($7,085)**	**($6,598)**	**($6,140)**	**($5,709)**	**($5,223)**	**($3,792)**	**($2,010)**	**($892)**	**($272)**	**($10)**
Third Party OpCos CFs																			
Fixed project costs		($460,641)		($774)	($11,347)	($27,102)	($36,712)	($43,068)	($45,955)	($46,072)	($46,072)	($46,072)	($46,072)	($45,298)	($34,709)	($18,916)	($9,355)	($3,004)	($117)
Interest costs		($83,092)	$'000	$0	$0	$0	($12,195.4)	($13,231)	($12,404)	($10,926)	($9,395)	($7,864)	($6,333)	($4,802)	($3,296)	($2,134)	($405)	($101)	($4)
Third Party Payment (net)		**($543,733)**	**$'000**	**($774)**	**($11,347)**	**($27,102)**	**($48,907)**	**($56,299)**	**($58,359)**	**($56,998)**	**($55,467)**	**($53,936)**	**($52,405)**	**($50,100)**	**($38,005)**	**($21,050)**	**($9,760)**	**($3,105)**	**($120)**
Discount factor		4.50%	%	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.70	0.67	0.64	0.62	0.59	0.56	0.54	0.52	0.49
Third Party Payment (NPC)		**($388,902)**	**$'000**	**($741)**	**($10,391)**	**($23,749)**	**($41,012)**	**($45,177)**	**($44,813)**	**($41,884)**	**($39,004)**	**($36,294)**	**($33,745)**	**($30,872)**	**($22,410)**	**($11,878)**	**($5,270)**	**($1,605)**	**($60)**
Third Party Payments																			
O/B			$'000	$0	$86,202	$246,394	$342,325	$374,212	$348,735	$303,243	$256,092	$208,940	$161,788	$114,637	$68,259	$32,470	$12,475	$3,120	$116
Drawn		$460,641	$'000	$86,976	$168,741	$135,032	$69,679	$18,670	$1,544	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Payment (Bv OpCo)	Change for scenario you wish to view --> 1-4	($543,733)	$'000	($774)	($11,347)	($27,102)	($48,907)	($56,298)	($58,359)	($56,998)	($55,467)	($53,936)	($52,405)	($50,100)	($38,005)	($21,050)	($9,760)	($3,105)	($120)
Interest Rate Charged	Scenario 1	3.2%	%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Interest Charged		$83,092	$'000	$0	$2,799	$8,001	$11,115	$12,151	$11,324	$9,846	$8,315	$6,784	$5,253	$3,722	$2,216	$1,054	$405	$101	$4
C/B			$'000	$86,202	$246,394	$342,325	$374,212	$348,735	$303,243	$256,092	$208,940	$161,788	$114,637	$68,259	$32,470	$12,475	$3,120	$116	$0
US 6m LIBOR			%	1.42%	1.71%	1.97%	2.16%	2.30%	2.45%	2.55%	2.66%	2.73%	2.79%	2.83%	2.85%	2.83%	2.83%	2.83%	2.80%
US 6m LIBOR + 50 bps	0.50%	%		1.9%	2.2%	2.5%	2.7%	2.8%	2.9%	3.0%	3.2%	3.2%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
US 6m LIBOR - 50 bps	-0.50%	%		0.9%	1.2%	1.5%	1.7%	1.8%	1.9%	2.0%	2.2%	2.2%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Static	1.83%	%	1	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Forward Curve	1.83%	%	2	3.2%	3.5%	3.8%	4.0%	4.1%	4.3%	4.4%	4.5%	4.6%	4.6%	4.7%	4.7%	4.7%	4.7%	4.7%	4.6%
Forward Curve + 50bps	1.83%	%	3	3.7%	4.0%	4.3%	4.5%	4.6%	4.8%	4.9%	5.0%	5.1%	5.1%	5.2%	5.2%	5.2%	5.2%	5.2%	5.1%
Forward Curve - 50bps	1.83%	%	4	2.7%	3.0%	3.3%	3.5%	3.6%	3.8%	3.9%	4.0%	4.1%	4.1%	4.2%	4.2%	4.2%	4.2%	4.2%	4.1%

The financial institutions have provided indicative variable pricing in the range of 175bps to 210bps over the 6month LIBOR - the 1.83% over the 6 month LIBOR is the mid point of this range

Data Tables - Presentation (F9 to refresh)

	NMPC Net	NMPC NPC
Static @ today's pricing	$91,549	$65,413
Forward Curve	$95,967	$68,593
Forward Curve + 50bps	$98,214	$70,237
Forward Curve - 50bps	$93,736	$66,962
Traditional	**$93,841**	**$72,442**

	NMPC Rate Case Net	NMPC Rate Case NPC
Static @ today's pricing	$14,142	$12,335
Forward Curve	$14,806	$12,724
Forward Curve + 50bps	$15,138	$13,002
Forward Curve - 50bps	$14,478	$12,448
Traditional	**$33,721**	**$29,665**

Discount Sensitivity	TPO NPC	Traditional NPC	Delta
4.00%	$67,795	$74,428	$6,634
4.50%	$65,413	$72,442	$7,030
5.00%	$63,138	$70,538	$7,400
5.50%	$60,965	$68,710	$7,745
6.00%	$58,888	$66,955	$8,067
6.50%	$56,903	$65,270	$8,367
7.00%	$55,004	$63,651	$8,647
7.50%	$53,187	$62,094	$8,907
8.00%	$51,448	$60,597	$9,149
8.50%	$49,783	$59,157	$9,374
9.00%	$48,188	$57,770	$9,582

NMPC Traditional payments

Assumptions																		
Financial year	**Total**	**Units**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**
Time period			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
x **Traditional NMPC Payments**																		
OPEX	$27,792	$'000	$4,724	$10,827	$6,982	$3,600	$1,535	$123	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
RETURNS	$16,461	$'000	$12	$817	$2,383	$2,581	$2,511	$2,041	$1,674	$1,370	$1,101	$843	$584	$339	$146	$49	$9	$0
AMORTIZATION	$49,588	$'000	$18	$699	$2,181	$3,651	$4,573	$4,959	$4,959	$4,959	$4,959	$4,959	$4,941	$4,260	$2,778	$1,308	$386	$0
Traditional Payment (net)	**$93,841**	**$'000**	**$4,754**	**$12,342**	**$11,546**	**$9,832**	**$8,619**	**$7,123**	**$6,633**	**$6,329**	**$6,060**	**$5,801**	**$5,525**	**$4,599**	**$2,924**	**$1,357**	**$395**	**$0**
Discount factor	4.50%	%	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.70	0.67	0.64	0.62	0.59	0.56	0.54	0.52	0.49
Traditional Payment (NPC)	**$72,442**	***$'000***	**$4,549**	**$11,302**	**$10,118**	**$8,245**	**$6,916**	**$5,470**	**$4,874**	**$4,450**	**$4,078**	**$3,736**	**$3,405**	**$2,712**	**$1,650**	**$733**	**$204**	**$0**

NMPC Sensitivity

Assumptions

Financial year		Total	Units	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
Time period				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Traditional NMPC CFs																			
Traditional Payment (net)		**($93,841)**	**$'000**	**($4,754)**	**($12,342)**	**($11,546)**	**($9,832)**	**($8,619)**	**($7,123)**	**($6,633)**	**($6,329)**	**($6,060)**	**($5,801)**	**($5,525)**	**($4,599)**	**($2,924)**	**($1,357)**	**($395)**	**$0**
Traditional Payment (NPC)		**($72,442)**	***$'000***	**($4,549)**	**($11,302)**	**($10,118)**	**($8,245)**	**($6,916)**	**($5,470)**	**($4,874)**	**($4,450)**	**($4,078)**	**($3,736)**	**($3,405)**	**($2,712)**	**($1,650)**	**($733)**	**($204)**	**$0**
Third Party NMPC CFs																			
Fixed project costs		($77,515)	$'000	($131)	($1,884)	($4,314)	($6,084)	($7,288)	($7,777)	($7,796)	($7,796)	($7,796)	($7,796)	($7,665)	($5,874)	($3,201)	($1,583)	($508)	($20)
Interest costs	16.89%	($14,034)	$'000	$0	$0	$0	($2,060)	($2,235)	($2,095)	($1,845)	($1,587)	($1,328)	($1,070)	($811)	($557)	($360)	($68)	($17)	($1)
NMPC: Third Party Payment (net)		($91,549)	**$'000**	**($131)**	**($1,884)**	**($4,314)**	**($8,144)**	**($9,523)**	**($9,872)**	**($9,642)**	**($9,383)**	**($9,125)**	**($8,866)**	**($8,477)**	**($6,430)**	**($3,561)**	**($1,651)**	**($525)**	**($20)**
NMPC: Third Party Payment (NPC)		**($65,413)**	***$'000***	**($125)**	**($1,726)**	**($3,780)**	**($6,829)**	**($7,642)**	**($7,580)**	**($7,085)**	**($6,598)**	**($6,140)**	**($5,709)**	**($5,223)**	**($3,792)**	**($2,010)**	**($892)**	**($272)**	**($10)**
Third Party OpCos CFs																			
Fixed project costs		($460,641)		($774)	($11,347)	($27,102)	($36,712)	($43,068)	($45,955)	($46,072)	($46,072)	($46,072)	($46,072)	($45,298)	($34,709)	($18,916)	($9,355)	($3,004)	($117)
Interest costs		($83,092)	$'000	$0	$0	$0	($12,195.4)	($13,231)	($12,404)	($10,926)	($9,395)	($7,864)	($6,333)	($4,802)	($3,296)	($2,134)	($405)	($101)	($4)
Third Party Payment (net)		**($543,733)**	**$'000**	**($774)**	**($11,347)**	**($27,102)**	**($48,907)**	**($56,298)**	**($58,359)**	**($56,998)**	**($55,467)**	**($53,936)**	**($52,405)**	**($50,100)**	**($38,005)**	**($21,050)**	**($9,760)**	**($3,105)**	**($120)**
Discount factor		4.50%	%	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.70	0.67	0.64	0.62	0.59	0.56	0.54	0.52	0.49
Third Party Payment (NPC)		**($388,902)**	***$'000***	**($741)**	**($10,391)**	**($23,749)**	**($41,012)**	**($45,177)**	**($44,813)**	**($41,884)**	**($39,004)**	**($36,294)**	**($33,745)**	**($30,872)**	**($22,410)**	**($11,878)**	**($5,270)**	**($1,605)**	**($60)**
Third Party Payments																			
O/B			$'000	$0	$86,202	$246,394	$342,325	$374,212	$348,735	$303,243	$256,092	$208,940	$161,788	$114,637	$68,259	$32,470	$12,475	$3,120	$116
Drawn		$460,641	$'000	$86,976	$168,741	$115,032	$69,679	$18,670	$1,544	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Payment (By OpCo)	Change for scenario you wish to view --> 1-4 (Scenarios illustrated	($543,733)	$'000	($774)	($11,347)	($27,102)	($48,907)	($56,298)	($58,359)	($56,998)	($55,467)	($53,936)	($52,405)	($50,100)	($38,005)	($21,050)	($9,760)	($3,105)	($120)
Interest Rate Charged	Scenario 1		%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Interest Charged		$83,092	$'000	$0	$2,799	$8,001	$11,115	$12,151	$11,324	$9,846	$8,315	$6,784	$5,253	$3,722	$2,216	$1,054	$405	$101	$4
C/B			$'000	$86,202	$246,394	$342,325	$374,212	$348,735	$303,243	$256,092	$208,940	$161,788	$114,637	$68,259	$32,470	$12,475	$3,120	$116	$0
US 6m LIBOR			%	1.42%	1.71%	1.97%	2.16%	2.30%	2.45%	2.55%	2.66%	2.73%	2.79%	2.83%	2.85%	2.83%	2.83%	2.83%	2.80%
US 6m LIBOR + 50 bps	0.50%		%	1.9%	2.2%	2.5%	2.7%	2.8%	2.9%	3.0%	3.2%	3.2%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
US 6m LIBOR - 50 bps	-0.50%		%	0.9%	1.2%	1.5%	1.7%	1.8%	1.9%	2.0%	2.2%	2.2%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Static	1.83%		% 1	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Forward Curve	1.83%		% 2	3.2%	3.5%	3.8%	4.0%	4.1%	4.3%	4.4%	4.5%	4.6%	4.6%	4.7%	4.7%	4.7%	4.7%	4.7%	4.6%
Forward Curve + 50bps	1.83%		% 3	3.7%	4.0%	4.3%	4.5%	4.6%	4.8%	4.9%	5.0%	5.1%	5.1%	5.2%	5.2%	5.2%	5.2%	5.2%	5.1%
Forward Curve - 50bps	1.83%		% 4	2.7%	3.0%	3.3%	3.5%	3.6%	3.8%	3.9%	4.0%	4.1%	4.1%	4.2%	4.2%	4.2%	4.2%	4.2%	4.1%

The financial institutions have provided indicative variable pricing in the range of 175bps to 210bps over the 6month LIBOR - the 1.83% over the 6 month LIBOR is the mid point of this range

Data Tables - Presentation (F9 to refresh)

	NMPC **Net**	*NMPC* **NPC**
Static @ today's pricing	$91,549	$65,413
Forward Curve	$95,967	$68,593
Forward Curve + 50bps	$98,214	$70,237
Forward Curve - 50bps	$93,736	$66,962
Traditional	**$93,841**	**$72,442**

	NMPC Rate Case **Net**	*NMPC Rate Case* **NPC**
Static @ today's pricing	$14,342	$12,335
Forward Curve	$14,806	$12,724
Forward Curve + 50bps	$15,138	$13,002
Forward Curve - 50bps	$14,478	$12,448
Traditional	**$33,721**	**$29,665**

Discount Sensitivity	*TPO NPC*	*Traditional NPC*	*Delta*
4.00%	$67,795	$74,428	$6,634
4.50%	$65,413	$72,442	$7,030
5.00%	$63,138	$70,538	$7,400
5.50%	$60,965	$68,710	$7,745
6.00%	$58,888	$66,955	$8,067
6.50%	$56,903	$65,270	$8,367
7.00%	$55,004	$63,651	$8,647
7.50%	$53,187	$62,094	$8,907
8.00%	$51,448	$60,597	$9,149
8.50%	$49,783	$59,157	$9,374
9.00%	$48,188	$57,770	$9,582

NMPC Traditional payments

Assumptions																		
Financial year	**Total**	**Units**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**
Time period			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
x **Traditional NMPC Payments**																		
OPEX	$27,792	$'000	$4,724	$10,827	$6,982	$3,600	$1,535	$123	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
RETURNS	$16,461	$'000	$12	$817	$2,383	$2,581	$2,511	$2,041	$1,674	$1,370	$1,101	$843	$584	$339	$146	$49	$9	$0
AMORTIZATION	$49,588	$'000	$18	$699	$2,181	$3,651	$4,573	$4,959	$4,959	$4,959	$4,959	$4,959	$4,941	$4,260	$2,778	$1,308	$386	$0
Traditional Payment (net)	**$93,841**	**$'000**	**$4,754**	**$12,342**	**$11,546**	**$9,832**	**$8,619**	**$7,123**	**$6,633**	**$6,329**	**$6,060**	**$5,801**	**$5,525**	**$4,599**	**$2,924**	**$1,357**	**$395**	**$0**
Discount factor	4.50%	%	0.96	0.92	0.88	0.84	0.80	0.77	0.73	0.70	0.67	0.64	0.62	0.59	0.56	0.54	0.52	0.49
Traditional Payment (NPC)	**$72,442**	***$'000***	**$4,549**	**$11,302**	**$10,118**	**$8,245**	**$6,916**	**$5,470**	**$4,874**	**$4,450**	**$4,078**	**$3,736**	**$3,405**	**$2,712**	**$1,650**	**$733**	**$204**	**$0**

Date of Request: July 27, 2017 Request No. DPS-689 AT-15
Due Date: August 7, 2017 NMPC Req. No. NM-1361

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: **GAS BUSINESS ENABLEMENT (GBE)**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

The alternatives considered for the GBE program are shown in Slide 36, Attachment 9 to your response to DPS-275. With reference to that response:

1. Provide a description of each alternative. Include the project scope (e.g., what would be replaced, how it would be replaced, and with what new programs and in what timeframe it would be replaced) and identify how well the alternative met the following GBE needs and objectives:

    a. Platform Consolidation;

    b. Regulatory Compliance;

    c. Workforce/Asset Management;

    d. Customer Service Improvements; and

    e. Training

For the alternatives that were not selected, explain why not and how far along in development the rejected alternative had proceeded, in terms of cost estimation and implementation schedule

as compared to the selected alternative, before the decision was made not to continue with the rejected alternative.

Response:

Below is a brief summary of each of the options considered on Slide 36, Attachment 9 of DPS-275:

Option 1: Tech Stabilization

Description: The Tech Stabilization option would extend the life of National Grid's current systems by 1) sourcing incremental system support, where available, for the systems that are no longer fully supported; and 2) updating the supporting infrastructure and devices, where possible.

Project Scope: No existing systems would be replaced. This option would involve a number of tactical investments.

Delivery/Time Frame: This would be on-going until the systems are ultimately replaced.

Reasons Rejected: The Tech Stabilization option would have a limited positive impact on system down time due to the overall age of the current systems, which limits the availability of support and upgrade infrastructure. There are no further anticipated benefits with this option. This option would further defer the necessary investments to upgrade/replace near obsolete and unsupported systems and, therefore, would not be a sustainable solution. For the above-mentioned reasons, the Tech Stabilization option was rejected early in the strategic assessment in August 2016 and only a high level cost estimate and implementation schedule were developed.

Option 2: Like for Like Replacements

Description: This option provides the minimum required investment to upgrade or replace current core unsupported and aging IS systems to modern, supported equivalents with no focus on enhancing capability.

Project Scope/Delivery: The main solutions that would be upgraded or replaced for Niagara Mohawk include Mwork and Storms for work delivery, iScheduler for scheduling, Gas Asset Management System ("GAMS") for asset management and engineering.

Delivery/Time Frame: This option would be delivered over at least four years using waterfall techniques where a solution is not delivered until all business requirements have been designed and developed.

Reasons Rejected: This option would be a pure technology remediation project and would not look to align processes, increase integration between systems, or address the broader challenges and opportunities that Niagara Mohawk's gas business faces. There would be a moderate improvement to application availability, but limited other improvements. Specifically, this option would not address performance improvements in gas safety and compliance that require

process improvements, systems integration, technical training and data improvements. As a result, this option was rejected early in the strategic assessment in August 2016 and only a high level cost estimate and implementation schedule were developed.

Option 3: Backbone

Description: This option is the minimum required investment to address the system requirements to support performance improvements in gas safety and compliance and mitigate key risk. It should be noted that this option does not address all elements in these areas nor does it enable many of the improvement opportunities, but it would improve system downtime and data sharing between teams and enable more consistent reporting.

Project Scope: The Backbone option would focus on replacing the multiple legacy work and asset management systems with a core enterprise work and asset management system (EAM). It would deliver process, integration and capability improvements limited to the work and asset management systems. The main solutions upgraded or replaced for Niagara Mohawk would be Mwork, Storms, Public Building, and Cascade (gas) for work delivery; iScheduler for resource scheduling; GAMS, Meter Inventory Tracking System ("MITS"), Pictometry, MapFrame, and Gas Leak Tracking for asset management and engineering; Fortis for document management; and Smallworld for GIS. The legacy systems will be replaced with Maximo for work and asset management, ESRI for GIS, and a Scheduling/Dispatch/Mobile application.

Delivery/Time Frame: The backbone only option would be implemented over 3.5 years using the more traditional waterfall implementation method on premise (*i.e.*, no Software as a Service or cloud solutions).

Reasons Rejected: The backbone option would be a largely focused on technology implementation. Specifically, it would not fully address performance improvements in gas safety and compliance that require behavioral/technical training, data improvements, such as mapping of services that are on paper today, and the focus on change management to support the organization through the implementation. As discussed in the Company's response to DPS-660, the backbone only option also does not provide the call center with visibility to work or the customer experience elements. It also does not fully integrate asset management and work management solutions including supporting graphical electronic data capture (*i.e.*, red lining) in the field. Other capabilities that would not be delivered include advanced analytics for work and asset management, supply chain solutions, and strategic change, which help to mitigate operational and technical risk of implementation. With the reduced focus on the operating model and change management, it is anticipated that any financial benefits would be offset by inefficient and inconsistent use of the new systems. A timeline and costs (leveraging some input from Accenture's model) were developed for this option but it was ultimately rejected by the Steering Group in December 2016 for the reasons noted above.

Option 4: Value Oriented – Jurisdiction Deployment

Description: This option was selected as the minimum required investment to address the risk of the legacy systems and performance improvements in gas pipeline safety and compliance, provide improvements in business performance and enhancements in the customer experience,

and create a platform for the future. Specifically, the Value Oriented – Jurisdiction Deployment includes the scope of Option 3 (Backbone) with additional enhanced capabilities such as:

- advanced asset management capabilities to enable graphical work design and electronic field data capture. This will improve record accuracy and increase the speed to update maps with new assets. It also will link the EAM to an Asset Investment Planning and Management (AIPM) tool to enable prioritizing asset investments across a number of criteria including risk as discussed in the Company's response to EDF-1(NK-4);

- advanced work management capabilities that include integrating resource management and planning to improve the effectiveness and efficiency of delivered work;

- a customer interaction layer that places the front line employee, dispatch, the call center and ultimately the customer on the same platform to provide visibility of the work to all stakeholders and enable customers the flexibility to book, move and get information on appointments using their preferred communication channel. This also includes a new call center front end so that customer representatives have visibility to the work in the field;

- change management capabilities reflecting lessons learned from past programs and industry best practice that (1) are delivered throughout the program lifecycle; (2) engage users in the actual process of developing the solution; and (3) involve support from the program team, business leadership, and support organizations such as Supply Chain and Information Services;

- field training via multiple media (including mobile) to improve employees' technical skills and simplify work methods resulting in enhanced field employees' capabilities to consistently deliver work safely for customers, follow the correct procedures and record the required information correctly;

- supply chain integration to the EAM to improve effectiveness of the supply chain in supporting capital project delivery;

- automated testing capabilities that would enable agile development techniques; and

- cloud and SaaS solutions where available to move this solutions onto modern platforms that will make it easier for the Company to keep the solutions up-to-date and supported against the latest cyber security threats.

Project Scope: The main solutions to be upgraded or replaced for Niagara Mohawk include Mwork, Storms, Public Building, and Cascade (gas) for work delivery; iScheduler for resource scheduling; GAMS, MITS, Pictometry, MapFrame, and Gas Leak Tracking for asset management and engineering; Fortis for document management; Smallworld for GIS; and CSS for call center terminals only. The solutions will be replaced with integrated versions of Maximo for work and asset management, Copperleaf for asset investment planning and management, ESRI for GIS and Salesforce for scheduling, dispatch, mobility, call center terminals and customer interaction.

Delivery/Time Frame: The Value Oriented – Jurisdiction Deployment option will be delivered using predominately cloud solutions and hybrid agile development techniques over 5 years. Under the agile development methodology, business and IS development teams work collaboratively in short-cycles to prioritize functionality and get to a minimum viable product (*i.e.*, the simplest solution that can be implemented) allowing earlier release of initial functionality and reprioritization of enhancements based on learning. It should be noted that despite the overall longer five year implementation timeframe for the enhanced capabilities in this option, implementation of the enhanced capabilities will not extend the 3.5 year timeframe of the backbone capabilities as the focus remains on risk prioritized replacement of the core systems.

Reasons Selected: This option would be a broader transformation project focused on people, process and technology designed to address gas pipeline safety and compliance, customer experience and improved business performance. Solutions will be developed on a modern technical architecture to support the business for a long period of time. Approximately $39M a year in measurable benefits would be realized, as detailed in Exhibit __ (GIOP-12), page 1, once the solutions are fully embedded, including Type I savings to Niagara Mohawk as shown on Exhibit __ (GIOP-12), page 2. Additional customer benefits that do not impact the Company's revenue requirements, including saving customers time by increasing the number and reducing the length of appointment windows, are discussed in detail in the Company's response to DPS-658.

This was the minimum cost solution to deliver the desired program outcomes. For all of the above-mentioned reasons, this option was recommended by the Steering Group in December 2016, and includes most refined timeline and cost modeling, as reflected in the Company's responses to DPS-431 and DPS-654. Importantly, National Grid did look at developing the solutions independently for each operating company, rather than consolidated as an enterprise-wide solution, but ruled it out as it was more costly (requiring duplicative design, development and testing of core functionality) than doing an enterprise-wide solution with individual releases across the operating companies as functionality is demonstrated.

Option 5: Value Oriented – Accelerated Deployment

Description/Project Scope/Delivery/Time Frame: The Value Oriented – Accelerated Deployment looked to implement the same scope as Option 4, but on an accelerated implementation timeframe for four and a half years.

Reasons Rejected: Accelerated deployment increased delivery costs as well as implementation risks. This option was further developed similar to Option 4 in terms of timeline and costs utilizing the detailed cost model developed with Accenture. However, the option was ultimately rejected by the Steering Group in December 2016 given the higher delivery costs, implementation risk, and recognition that implementation of a complex program such as GBE requires a measured approach, allowing sufficient time for comprehensive change management and system/regression testing.

The following summary table depicts how each of the options meet each of the GBE objectives of platform consolidation, regulatory compliance, workforce/asset management, customer

service improvements and training discussed in detail above. Red circles (R) denote that the objective is not met by the option, amber (A) that they are partially met and green (G) that they are fully met.

	Platform Consolidation	Regulatory Compliance	Workforce/ Asset Management	Customer Service Improvements	Training
Option 1: Tech Stabilization	R	R	R	R	R
Option 2: Like for Like Replacements	R	R	A	R	R
Option 3: Backbone	G	A	G	R	R
Option 4: Value Oriented – Jurisdiction Deployment	G	G	G	G	G
Option 5: Value Oriented – Accelerated Deployment	G	G	G	G	G

Name of Respondent:
Johnny Johnston

Date of Reply:
August 7, 2017

Date of Request: August 17, 2017 Request No. DPS-732 AT-18
Due Date: August 28, 2017 NMPC Req. No. NM-1638

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Andy Timbrook

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: **GAS BUSINESS ENABLEMENT (GBE) COST/BENEFIT ANALYSIS (CBA)**

Request:

In this interrogatory, all requests for data, workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

For each alternative provided in the response to DPS-689, provide a full cost/benefit analysis that includes, but is not limited to: all quantifiable benefits; all costs, including both the cost of implementation and the costs associated with any risks assumed by selecting the alternative; and the payback period, if applicable, with supporting calculations. If any of these items are not available for each alternative, explain why not.

Response:

In assessing the options for GBE, National Grid looked at the costs, benefits, and risk associated with each of the options identified in the Company's response to DPS - 689. The results of those assessments are discussed below. It should be noted that the level of detail of the analysis increased as the options were narrowed down to the preferred option. This allowed the most effort and detail to be incorporated into the analysis of the preferred option to make the assessments of costs, benefits, and risk as accurate as possible.

As discussed in the Direct Testimony of the Gas Infrastructure and Operations Panel, the need to replace aging systems is a significant factor underlying the need for Gas Business Enablement (GBE) and, similar to replacing aging gas infrastructure in the field (*e.g.*, metallic gas main with

new plastic), the primary benefits are reduced risk and increased operational performance. Accordingly, National Grid's assessments of each option were particularly focused on the relative risk and operational benefits.

Option 1: Tech Stabilization. As discussed in the response to DPS-689, the Tech Stabilization option focused on trying to further extend the life of already aged and under supported systems. Because this option was deemed to result in an unacceptable risk of system failure, significant effort in developing the costs was not undertaken. After any major system failure under this option, the Company expects significant costs associated with (i) sustaining manual efforts and (ii) risks of loss of data or operational and system functionality until one of the other alternative options below was hurriedly implemented at likely a significantly higher cost than if done in a planned and preemptive manner. The Tech Stabilization option would simply defer the necessary investments to upgrade/replace near obsolete and unsupported systems (*i.e.*, result in costs to upgrade and replace in the future) and, considering the risks of system failure associated with this option, the Company did not expect, or calculate, any payback for this option.

Option 2: Like for Like Replacements. This option reduced risk of system failure by replacing old systems with new systems. However, the Like for Like Replacement did not address performance improvements in customer service or gas pipeline safety and compliance, which require system integrations. High level cost estimates for this solution were developed but, as the solution was limited to replacement of existing systems and functionality, there were anticipated to be minimal financial benefits (the main benefit expected was reduced risk of system failure). Therefore, a detailed, refined analysis of cost beyond the high level costs estimated or financial benefits/payback analysis, was not developed given the limited benefits this option was expected to provide.

Option 3: Backbone. This option implemented a core enterprise and work management system that would address the risk of aging systems and integrate some of the key systems to improve gas safety and compliance. As discussed in detail in the Company's response to DPS-689, the Backbone option did not address the customer service elements, strategic change, field training and advanced analytics. Due to missing elements to make this a holistic change program, there was low business confidence to quantify and commit to financial benefits with this option. The main benefits anticipated in the Backbone were improved reliability to systems, better communications between teams, and improved gas pipeline safety and compliance performance (with further improvements still required). While input from Accenture's model was leveraged to develop costs estimated at $273 million, no quantifiable financial benefits were developed.

Attachment 1 depicts the costs by year (red bars) as well as cumulative spend, with no anticipated payback period, of Option 3. Attachment 2 shows that, over ten years, the total Net Present Value ("NPV") is negative $188 million.

As discussed herein and in DPS-689, all of the above-mentioned factors were considered in rejecting Option 3.

Option 4: Value Oriented – Jurisdiction Deployment. This was the recommended option that built on the Backbone option to include customer capabilities, strategic change, field training,

and advanced analytics. Further detail on these enhanced capabilities was provided in the Company's response to DPS-660. This solution is forecast to cost $458M in total for the enterprise or $185M incrementally to Option 3. The operating costs for this solution are detailed in Exhibit __ (GIOP-10) and DPS-654; the capital costs are detailed in Exhibit __ (ISP-3) and DPS-654; and the run the business costs are detailed in Exhibit __ (GIOP-11) and DPS-657. Once fully implemented and stabilized, quantifiable financial benefits were estimated at $39M a year, as detailed in Exhibit __ (GIOP-12), Page 1 and DPS-430.

As outlined in the Direct Testimony of the Gas Infrastructure and Operations Panel, this option will deliver a broad range of benefits and performance improvements relating to gas safety, operations support and processes, and customer interaction and service. Moving onto a modern IS infrastructure will also provide a number of benefits including improved reliability and performance, support and upgrade capabilities, reduced need to enhance legacy infrastructure, reduced risk of obsolescence and opportunity for enhanced cyber security.

Option 4 has as an incremental total cost of $185M as compared to Option 3, but with incremental benefits of $39M a year. Over a five-year period, the $39.615 annual benefits will amount to $198M, which is greater than the incremental $185M investment in Option 4. Slide 32 of the business case document that was provided as Attachment 9 to DPS-275 depicts the total program costs ($458M) in the red bars, quantifiable benefits as green bars, and the net spend of the incremental capabilities to Option 3 ($185M) as a blue line against the annual benefits. The breakeven of the incremental $185M in costs over the Backbone option is estimated to occur in FY26, which is approximately four years and two month after the majority of the capabilities have been implemented by the end of FY21. Attachment 3 contains the worksheet for Slide 32 in Attachment 9, DPS-275.

National Grid also completed a ten year NPV analysis comparing Option 4 to Option 3. Slide 33 of the business case document that was provided as Attachment 9 to DPS 275 shows the NPV calculation over 10 years for the incremental costs and benefits of Option 4 over Option 3 to be nearly $100M positive. Attachment 4 contains the worksheet for Slide 33 in Attachment 9, DPS-275.

The NPV calculations were limited to Company-specific costs and, therefore, broader financial benefits, such as the value of saved customer time that was described in the Company's response to DSP 658 and estimated to be worth between $7-14 million a year for Niagara Mohawk's customers, were not included. Including enterprise-wide numbers in the NPV model would increase the 10 year NPV to be between positive $379 and positive $640M. As the Company does not directly see this benefit it was not built into the NPV analysis but this gives an indication of the broader benefits enabled by GBE.

As discussed herein and in DPS-689, all of the above-mentioned factors were considered in the overall decision to proceed with Option 4.

Option 5: Value Oriented – Accelerated Deployment. This option looked to implement Option 4 on an accelerated implementation timeframe over four and a half years and across all jurisdictions with a big bang approach. This option had higher costs due to the additional

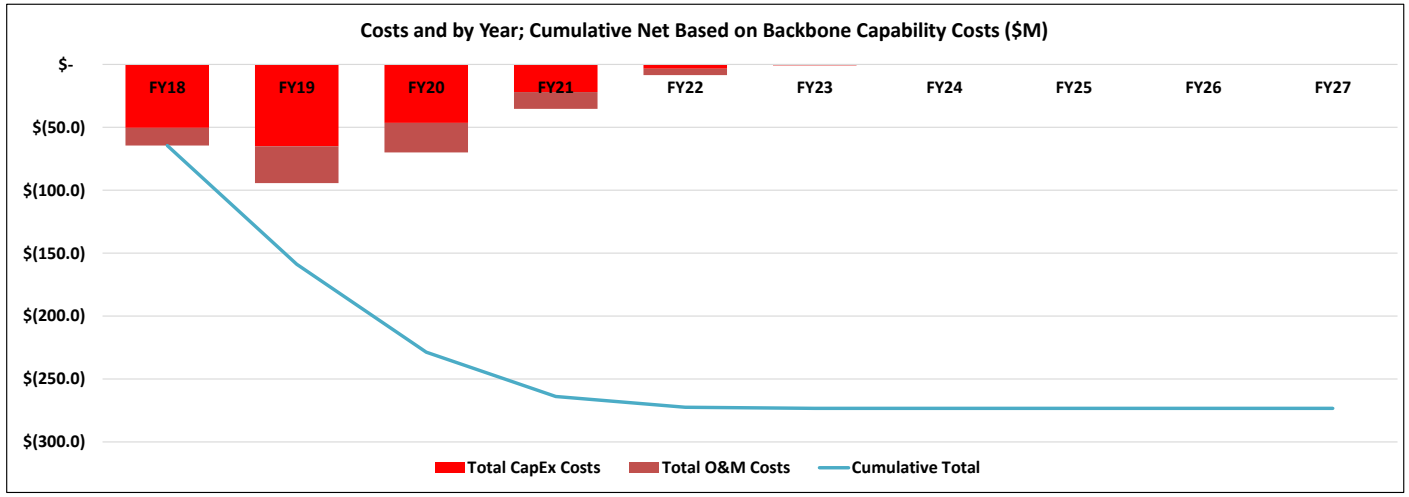
resources to complete work in parallel, with the same benefits in Option 4. This option was rejected due to the higher implementation risk. The payback period was also extended by two months to four years and four months. This option was ultimately rejected given the higher delivery costs, implementation risk, and recognition that implementation of a complex program such as GBE requires a measured approach, allowing sufficient time for comprehensive change management and system/regression testing. As a result, an NPV calculation was not completed.

Name of Respondent:
Johnny Johnston

Date of Reply:
August 23, 2017

Cost Benefit Chart - Option 3

		3	4	5	6	7	8	9	10	11	12	
Total Summary	**Category**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**Cumulative Total**
50	Total O&M Benefit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	Total O&M Costs	$ (14.1)	$ (29.2)	$ (23.5)	$ (13.3)	$ (5.1)	$ (0.2)	$ -	$ -	$ -	$ -	$ (85.5)
50	Total CapEx Benefit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total CapEx Costs	$ (50.3)	$ (65.1)	$ (46.4)	$ (22.0)	$ (3.3)	$ (0.7)	$ -	$ -	$ -	$ -	$ (187.9)
	Cumulative O&M	$ (14.1)	$ (43.3)	$ (66.8)	$ (80.1)	$ (85.3)	$ (85.5)	$ (85.5)	$ (85.5)	$ (85.5)	$ (85.5)	
	Cumulative CapEx	$ (50.3)	$ (115.4)	$ (161.9)	$ (183.8)	$ (187.2)	$ (187.9)	$ (187.9)	$ (187.9)	$ (187.9)	$ (187.9)	
	Total Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Costs	$ (64.5)	$ (94.3)	$ (69.9)	$ (35.3)	$ (8.5)	$ (0.9)	$ -	$ -	$ -	$ -	$ (273)
	Cumulative Total	**$ (64.5)**	**$ (158.8)**	**$ (228.7)**	**$ (263.9)**	**$ (272.4)**	**$ (273.3)**	**$ (273)**	**$ (273)**	**$ (273)**	**$ (273)**	



INPUTS

Inputs and Assumptions

Finance Inputs		
Discount Rate	After-tax W	9.98%
Corporate Tax Rate	Marginal Co	40.00%
Base Year	Base Year	2018

Depreciation Assumptions	
Category - Depreciation	**Composite**
Hardware - Book	2.9%
Hardware - MACRS	5
Software - Book	2.9%
Software - MACRS	7
Plant & Machinery - Book	2.9%
Plant & Machinery - MACRS	20

Column Index	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MACRS - Useful Life	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**FY33**	**FY34**	**FY35**	**FY36**	**FY37**
3	33.3%	44.5%	14.8%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	20.0%	32.0%	19.2%	11.5%	11.5%	5.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7	14.3%	24.5%	17.5%	12.5%	8.9%	8.9%	8.9%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	10.0%	18.0%	14.4%	11.5%	9.2%	7.4%	6.6%	6.6%	6.6%	6.6%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15	5.0%	9.5%	8.6%	7.7%	6.9%	6.2%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	3.0%	0.0%	0.0%	0.0%	0.0%
20	3.8%	7.2%	6.7%	6.2%	5.7%	5.3%	4.9%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
39	2.5%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%

NOTE: MACRS assumes half-year convention

FINANCIAL SUMMARY

Insert Summary Tab Output Here - COSTS

		Values										
Workstream	**Engine Category**	**Sum of FY2018**	**Sum of FY2019**	**Sum of FY2020**	**Sum of FY2021**	**Sum of FY2022**	**Sum of FY2023**	**Sum of FY2024**	**Sum of FY2025**	**Sum of FY2026**	**Sum of 10 yr FY Total**	
Backbone	Software O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Hardware O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Contractor O&M	($3,400)	($10,200)	($6,800)	$0	$0	$0	$0	$0	$0	($20,400)	
	ExternalApplication Maintenance ProviderOnshore O&M	($15)	($95)	($12)	($12)	$0	$0	$0	$0	$0	($135)	
	ExternalApplication Maintenance ProviderOffshore O&M	$0	($20)	$0	$0	$0	$0	$0	$0	$0	($20)	
	ExternalBusiness/Management ConsultantOnshore O&M	($2,048)	($2,260)	($2,176)	($1,534)	($402)	$0	$0	$0	$0	($8,420)	
	ExternalBusiness/Management ConsultantOffshore O&M	($74)	$0	$0	$0	$0	$0	$0	$0	$0	($74)	
	ExternalSystem IntegratorOnshore O&M	($3,051)	($5,274)	($3,579)	($2,822)	($668)	($140)	$0	$0	$0	($15,535)	
	ExternalSystem IntegratorOffshore O&M	($405)	($1,715)	($1,086)	($805)	($460)	($11)	$0	$0	$0	($4,482)	
	InternalClient ExecutiveOnshore O&M	($1,569)	($2,636)	($2,810)	($1,110)	($122)	$0	$0	$0	$0	($8,248)	
	InternalClient Business - Non ExecutiveOnshore O&M	($1,735)	($3,546)	($3,933)	($3,764)	($2,510)	$0	$0	$0	$0	($15,487)	
	InternalClient IS - Non ExecutiveOnshore O&M	($983)	($2,139)	($2,122)	($2,510)	($806)	$0	$0	$0	$0	($8,560)	
	Expenses O&M	($869)	($1,297)	($981)	($743)	($182)	($24)	$0	$0	$0	($4,095)	
	Software	($21,063)	($6,313)	($2,980)	($1,148)	$0	$0	$0	$0	$0	($31,503)	
	Hardware	($2,162)	($5,340)	($3,603)	$0	$0	$0	$0	$0	$0	($11,105)	
	Contractor CapEx	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalApplication Maintenance ProviderOnshore CapEx	($61)	($852)	($112)	($112)	$0	$0	$0	$0	$0	($1,137)	
	ExternalApplication Maintenance ProviderOffshore CapEx	($951)	($2,012)	($149)	$0	$0	$0	$0	$0	$0	($3,112)	
	ExternalBusiness/Management ConsultantOnshore CapEx	($3,916)	($3,368)	($2,277)	($332)	($56)	$0	$0	$0	$0	($9,949)	
	ExternalBusiness/Management ConsultantOffshore CapEx	($372)	$0	$0	$0	$0	$0	$0	$0	$0	($372)	
	ExternalSystem IntegratorOnshore CapEx	($11,576)	($25,856)	($21,760)	($11,160)	($1,857)	($561)	$0	$0	$0	($72,770)	
	ExternalSystem IntegratorOffshore CapEx	($3,022)	($7,343)	($4,717)	($3,469)	($485)	($43)	$0	$0	$0	($19,079)	
	InternalClient ExecutiveOnshore CapEx	($1,231)	($2,022)	($2,695)	($911)	($161)	$0	$0	$0	$0	($7,020)	
	InternalClient Business - Non ExecutiveOnshore CapEx	($2,029)	($2,811)	($2,192)	($850)	($133)	$0	$0	$0	$0	($8,015)	
	InternalClient IS - Non ExecutiveOnshore CapEx	($1,306)	($4,061)	($1,851)	($1,999)	($330)	$0	$0	$0	$0	($9,547)	
	Expenses CapEx	($2,644)	($5,113)	($4,105)	($1,973)	($325)	($95)	$0	$0	$0	($14,255)	
Backbone Total		**($64,482)**	**($94,273)**	**($69,942)**	**($35,253)**	**($8,496)**	**($875)**	**$0**	**$0**	**$0**	**($273,320)**	60%
Performance	Software O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Hardware O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Contractor O&M	($3,150)	($10,152)	($6,823)	($500)	$0	$0	$0	$0	$0	($20,625)	
	ExternalApplication Maintenance ProviderOnshore O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalApplication Maintenance ProviderOffshore O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalBusiness/Management ConsultantOnshore O&M	($5,818)	($13,700)	($4,272)	($1,780)	($793)	($121)	$0	$0	$0	($26,483)	
	ExternalBusiness/Management ConsultantOffshore O&M	$0	($766)	$0	$0	$0	$0	$0	$0	$0	($766)	
	ExternalSystem IntegratorOnshore O&M	($661)	($354)	($630)	($954)	($750)	$0	$0	$0	$0	($3,348)	
	ExternalSystem IntegratorOffshore O&M	($20)	($71)	($108)	($231)	($74)	$0	$0	$0	$0	($505)	
	InternalClient ExecutiveOnshore O&M	($636)	($2,197)	($1,739)	($909)	($83)	$0	$0	$0	$0	($5,563)	
	InternalClient Business - Non ExecutiveOnshore O&M	($1,979)	($4,325)	($2,417)	($1,900)	($1,647)	($413)	$0	$0	$0	($12,682)	
	InternalClient IS - Non ExecutiveOnshore O&M	($458)	($966)	($1,015)	($1,277)	($329)	$0	$0	$0	$0	($4,045)	
	Expenses O&M	($1,101)	($2,389)	($833)	($465)	($262)	($21)	$0	$0	$0	($5,071)	
	Software	($2,900)	($2,850)	($1,100)	($1,350)	($50)	$0	$0	$0	$0	($8,250)	
	Hardware	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Contractor CapEx	$0	($21,880)	($8,995)	$0	$0	$0	$0	$0	$0	($30,875)	
	ExternalApplication Maintenance ProviderOnshore CapEx	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalApplication Maintenance ProviderOffshore CapEx	($300)	($643)	($55)	$0	$0	$0	$0	$0	$0	($998)	
	ExternalBusiness/Management ConsultantOnshore CapEx	($1,136)	($2,157)	($1,462)	($2,674)	($262)	($40)	$0	$0	$0	($7,730)	
	ExternalBusiness/Management ConsultantOffshore CapEx	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalSystem IntegratorOnshore CapEx	($447)	($6,238)	($8,988)	($11,513)	($3,625)	$0	$0	$0	$0	($30,811)	
	ExternalSystem IntegratorOffshore CapEx	($221)	($1,188)	($1,320)	($2,566)	($711)	$0	$0	$0	$0	($6,006)	
	InternalClient ExecutiveOnshore CapEx	($249)	($780)	($827)	($778)	($170)	$0	$0	$0	$0	($2,805)	
	InternalClient Business - Non ExecutiveOnshore CapEx	($323)	($1,002)	($1,261)	($2,460)	($928)	($68)	$0	$0	$0	($6,042)	
	InternalClient IS - Non ExecutiveOnshore CapEx	($325)	($1,385)	($1,467)	($1,907)	($578)	$0	$0	$0	$0	($5,663)	
	Expenses CapEx	($269)	($1,427)	($1,777)	($2,412)	($661)	($7)	$0	$0	$0	($6,552)	
Performance Total		**($19,994)**	**($74,468)**	**($45,089)**	**($33,677)**	**($10,924)**	**($669)**	**$0**	**$0**	**$0**	**($184,821)**	40%
										Total	**($458,141)**	

% of Total Investment	Support	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	Total	
60%	Backbone		$0	($854)	($4,239)	($9,211)	($10,933)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($130,688)	
40%	Performance		$0	($577)	($2,866)	($6,229)	($7,393)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($88,372)	
	Total		**$0**	**($1,431)**	**($7,105)**	**($15,440)**	**($18,327)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($219,060)**	

Output for Financial Summary

Backbone	O&M	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	Total	
	Labor		($9,880)	($17,685)	($15,720)	($12,558)	($4,967)	($151)	$0	$0	$0						($60,961)	
	Contractor / 3rd Party		($3,400)	($10,200)	($6,800)	$0	$0	$0	$0	$0	$0						($20,400)	
	Program Expenses		($869)	($1,297)	($981)	($743)	($182)	($24)	$0	$0	$0						($4,095)	
	HW/SW Support		$0	($854)	($4,239)	($9,211)	($10,933)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($130,688)	
	Total O&M		**($14,149)**	**($30,036)**	**($27,740)**	**($22,512)**	**($16,082)**	**($10,720)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($216,144)**	
	CapEx	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**Total**	
	Labor		($24,464)	($48,325)	($35,753)	($18,833)	($3,021)	($604)	$0	$0	$0						($131,000)	
	Contractor / 3rd Party		$0	$0	$0	$0	$0	$0	$0	$0	$0						$0	
	Program Expenses		($2,644)	($5,113)	($4,105)	($1,973)	($325)	($95)	$0	$0	$0						($14,255)	
	Software		($21,063)	($6,313)	($2,980)	($1,148)	$0	$0	$0	$0	$0						($31,503)	
	Hardware		($2,162)	($5,340)	($3,603)	$0	$0	$0	$0	$0	$0						($11,105)	
	Total CapEx		**($50,333)**	**($65,091)**	**($46,441)**	**($21,953)**	**($3,347)**	**($700)**	**$0**	**$0**	**$0**						**($187,864)**	**($404,008)**

Performance	O&M	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	Total	
	Labor		($9,571)	($22,379)	($10,181)	($7,052)	($3,676)	($534)	$0	$0	$0						($53,393)	
	Contractor / 3rd Party		($3,150)	($10,152)	($6,823)	($500)	$0	$0	$0	$0	$0						($20,625)	
	Program Expenses		($1,101)	($2,389)	($833)	($465)	($262)	($21)	$0	$0	$0						($5,071)	
	HW/SW Support		$0	($577)	($2,866)	($6,229)	($7,393)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($88,372)	
	Total O&M		**($13,823)**	**($35,497)**	**($20,704)**	**($14,245)**	**($11,332)**	**($7,685)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($167,461)**	
	CapEx	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**Total**	
	Labor		($3,002)	($13,392)	($15,380)	($21,898)	($6,274)	($108)	$0	$0	$0						($60,055)	
	Contractor / 3rd Party		$0	($21,880)	($8,995)	$0	$0	$0	$0	$0	$0						($30,875)	
	Program Expenses		($269)	($1,427)	($1,777)	($2,412)	($661)	($7)	$0	$0	$0						($6,552)	
	Software		($2,900)	($2,850)	($1,100)	($1,350)	($50)	$0	$0	$0	$0						($8,250)	
	Hardware		$0	$0	$0	$0	$0	$0	$0	$0	$0						$0	
	Total CapEx		**($6,171)**	**($39,549)**	**($27,252)**	**($25,660)**	**($6,985)**	**($115)**	**$0**	**$0**	**$0**						**($105,732)**	**($273,193)**

Insert Benefits Pivot Tab Output Here - BENEFITS

Row Labels	Sum of FY18	Sum of FY19	Sum of FY20	Sum of FY21	Sum of FY22	Sum of FY23	Sum of FY24	Sum of FY25	Sum of FY26
Business Case	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CapEx	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capacity Savings	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Compliance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Spend Reduction	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capacity Savings	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Compliance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Spend Reduction	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grand Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Output for Financial Summary

Row Labels	Sum of FY18	Sum of FY19	Sum of FY20	Sum of FY21	Sum of FY22	Sum of FY23	Sum of FY24	Sum of FY25	Sum of FY26	FY27	FY28	FY29	FY30	FY31	FY32
Business Case	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CapEx	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capacity Savings	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Compliance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Spend Reduction	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capacity Savings	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Compliance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Spend Reduction	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Grand Total	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Depreciation

	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Net Capex															
Hardware	(2,162)	(5,340)	(3,603)	-	-	-	-	-	-	-	-	-	-	-	-
Software Capex															
Software Licenses	(21,063)	(6,313)	(2,980)	(1,148)	-	-	-	-	-	-	-	-	-	-	-
Labor	(24,464)	(48,325)	(35,753)	(18,833)	(3,021)	(604)	-	-	-	-	-	-	-	-	-
Contractor / 3rd Party	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Program Expenses	(2,644)	(5,113)	(4,105)	(1,973)	(325)	(95)	-	-	-	-	-	-	-	-	-
Software Total	(48,170)	(59,750)	(42,838)	(21,953)	(3,347)	(700)	-	-	-	-	-	-	-	-	-
Plant & Machinery (Benefits)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**(50,333)**	**(65,091)**	**(46,441)**	**(21,953)**	**(3,347)**	**(700)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Depreciation

Software - Book	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Year															
Year 1	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)	(1,397)
Year 2		(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)	(1,733)
Year 3			(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)	(1,242)
Year 4				(637)	(637)	(637)	(637)	(637)	(637)	(637)	(637)	(637)	(637)	(637)	(637)
Year 5					(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)
Year 6						(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)
Year 7							-	-	-	-	-	-	-	-	-
Year 8								-	-	-	-	-	-	-	-
Year 9									-	-	-	-	-	-	-
Year 10										-	-	-	-	-	-
Year 11											-	-	-	-	-
Year 12												-	-	-	-
Year 13													-	-	-
Year 14														-	-
Year 15															-
Total Book Depreciation	**(1,397)**	**(3,130)**	**(4,372)**	**(5,009)**	**(5,106)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**	**(5,126)**

Hardware - Book	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Year															
Year 1	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)	(63)
Year 2		(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)	(155)
Year 3			(104)	(104)	(104)	(104)	(104)	(104)	(104)	(104)	(104)	(104)	(104)	(104)	(104)
Year 4				-	-	-	-	-	-	-	-	-	-	-	-
Year 5					-	-	-	-	-	-	-	-	-	-	-
Year 6						-	-	-	-	-	-	-	-	-	-
Year 7							-	-	-	-	-	-	-	-	-
Year 8								-	-	-	-	-	-	-	-
Year 9									-	-	-	-	-	-	-
Year 10										-	-	-	-	-	-
Year 11											-	-	-	-	-
Year 12												-	-	-	-
Year 13													-	-	-
Year 14														-	-
Year 15															-
Total Book Depreciation	**(63)**	**(218)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**	**(322)**

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	Plant & Machinery - Book	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
	Year															
	Year 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 3			-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 4				-	-	-	-	-	-	-	-	-	-	-	-
	Year 5					-	-	-	-	-	-	-	-	-	-	-
	Year 6						-	-	-	-	-	-	-	-	-	-
	Year 7							-	-	-	-	-	-	-	-	-
	Year 8								-	-	-	-	-	-	-	-
	Year 9									-	-	-	-	-	-	-
	Year 10										-	-	-	-	-	-
	Year 11											-	-	-	-	-
	Year 12												-	-	-	-
	Year 13													-	-	-
	Year 14														-	-
	Year 15															-
	Total Book Depreciation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Software - MACRS															
Years	**7**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**
	Year															
	Year 1	(6,884)	(11,797)	(8,425)	(6,016)	(4,302)	(4,297)	(4,302)	(2,148)	-	-	-	-	-	-	-
	Year 2		(8,538)	(14,633)	(10,450)	(7,463)	(5,336)	(5,330)	(5,336)	(2,665)	-	-	-	-	-	-
	Year 3			(6,122)	(10,491)	(7,492)	(5,351)	(3,825)	(3,821)	(3,825)	(1,911)	-	-	-	-	-
	Year 4				(3,137)	(5,376)	(3,840)	(2,742)	(1,960)	(1,958)	(1,960)	(979)	-	-	-	-
	Year 5					(478)	(820)	(585)	(418)	(299)	(299)	(299)	(149)	-	-	-
	Year 6						(100)	(171)	(122)	(87)	(62)	(62)	(62)	(31)	-	-
	Year 7							-	-	-	-	-	-	-	-	-
	Year 8								-	-	-	-	-	-	-	-
	Year 9									-	-	-	-	-	-	-
	Year 10										-	-	-	-	-	-
	Year 11											-	-	-	-	-
	Year 12												-	-	-	-
	Year 13													-	-	-
	Year 14														-	-
	Year 15															-
	Total MACRS Depreciation	**(6,884)**	**(20,335)**	**(29,179)**	**(30,095)**	**(25,111)**	**(19,742)**	**(16,955)**	**(13,806)**	**(8,835)**	**(4,232)**	**(1,340)**	**(212)**	**(31)**	**-**	**-**

Hardware - MACRS

Years	5	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
	Year															
	Year 1	(432)	(692)	(415)	(249)	(249)	(125)	-	-	-	-	-	-	-	-	-
	Year 2		(1,068)	(1,709)	(1,025)	(615)	(615)	(308)	-	-	-	-	-	-	-	-
	Year 3			(721)	(1,153)	(692)	(415)	(415)	(208)	-	-	-	-	-	-	-
	Year 4				-	-	-	-	-	-	-	-	-	-	-	-
	Year 5					-	-	-	-	-	-	-	-	-	-	-
	Year 6						-	-	-	-	-	-	-	-	-	-
	Year 7							-	-	-	-	-	-	-	-	-
	Year 8								-	-	-	-	-	-	-	-
	Year 9									-	-	-	-	-	-	-
	Year 10										-	-	-	-	-	-
	Year 11											-	-	-	-	-
	Year 12												-	-	-	-
	Year 13													-	-	-
	Year 14														-	-
	Year 15															-
	Total MACRS Depreciation	**(432)**	**(1,760)**	**(2,845)**	**(2,427)**	**(1,556)**	**(1,155)**	**(723)**	**(208)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Plant & Machinery - MACRS

Years	20	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
	Year															
	Year 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 3			-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 4				-	-	-	-	-	-	-	-	-	-	-	-
	Year 5					-	-	-	-	-	-	-	-	-	-	-
	Year 6						-	-	-	-	-	-	-	-	-	-
	Year 7							-	-	-	-	-	-	-	-	-
	Year 8								-	-	-	-	-	-	-	-
	Year 9									-	-	-	-	-	-	-
	Year 10										-	-	-	-	-	-
	Year 11											-	-	-	-	-
	Year 12												-	-	-	-
	Year 13													-	-	-
	Year 14														-	-
	Year 15															-
	Total MACRS Depreciation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Total Book	**(1,460)**	**(3,347)**	**(4,694)**	**(5,331)**	**(5,428)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**	**(5,448)**
	Total MACRS	**(7,316)**	**(22,095)**	**(32,024)**	**(32,522)**	**(26,667)**	**(20,897)**	**(17,678)**	**(14,014)**	**(8,835)**	**(4,232)**	**(1,340)**	**(212)**	**(31)**	**-**	**-**
	MACRS less Book Depreciation	**(5,856)**	**(18,748)**	**(27,330)**	**(27,192)**	**(21,240)**	**(15,449)**	**(12,230)**	**(8,566)**	**(3,387)**	**1,216**	**4,108**	**5,236**	**5,417**	**5,448**	**5,448**

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Free Cash Flow - Option 3

($000)

		Type	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Opex Benefits																	
	Capacity Savings		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Compliance		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Spend Reduction		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Opex Benefits			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opex Expenses																	
	Labor	Investment	(9,880)	(17,685)	(15,720)	(12,558)	(4,967)	(151)	-	-	-	-	-	-	-	-	-
	Contractor / 3rd Part	Investment	(3,400)	(10,200)	(6,800)	-	-	-	-	-	-	-	-	-	-	-	-
	Program Expenses	Investment	(869)	(1,297)	(981)	(743)	(182)	(24)	-	-	-	-	-	-	-	-	-
	SW / HW Support	Maintenance	-	(854)	(4,239)	(9,211)	(10,933)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)
Total Opex Expenses			(14,149)	(30,036)	(27,740)	(22,512)	(16,082)	(10,720)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)	(10,545)
EBITDA			**(14,149)**	**(30,036)**	**(27,740)**	**(22,512)**	**(16,082)**	**(10,720)**	**(10,545)**	**(10,545)**	**(10,545)**	**(10,545)**	**(10,545)**	**(10,545)**	**(10,545)**	**(10,545)**	**(10,545)**
Depreciation (Book, Net)			(1,460)	(3,347)	(4,694)	(5,331)	(5,428)	(5,448)	(5,448)	(5,448)	(5,448)	(5,448)	(5,448)	(5,448)	(5,448)	(5,448)	(5,448)
EBIT			**(15,609)**	**(33,383)**	**(32,434)**	**(27,842)**	**(21,510)**	**(16,168)**	**(15,993)**	**(15,993)**	**(15,993)**	**(15,993)**	**(15,993)**	**(15,993)**	**(15,993)**	**(15,993)**	**(15,993)**
Income Taxes			6,243	13,353	12,973	11,137	8,604	6,467	6,397	6,397	6,397	6,397	6,397	6,397	6,397	6,397	6,397
Net Income			**(9,365)**	**(20,030)**	**(19,460)**	**(16,705)**	**(12,906)**	**(9,701)**	**(9,596)**	**(9,596)**	**(9,596)**	**(9,596)**	**(9,596)**	**(9,596)**	**(9,596)**	**(9,596)**	**(9,596)**
Depreciation (Book, Net)			1,460	3,347	4,694	5,331	5,428	5,448	5,448	5,448	5,448	5,448	5,448	5,448	5,448	5,448	5,448
Net Capex			(50,333)	(65,091)	(46,441)	(21,953)	(3,347)	(700)	0	0	0	0	0	0	0	0	0
Deferred Income Taxes			2,343	7,499	10,932	10,877	8,496	6,180	4,892	3,426	1,355	(486)	(1,643)	(2,095)	(2,167)	(2,179)	(2,179)
Free Cash Flow			**$ (55,896)**	**$ (74,274)**	**$ (50,275)**	**$ (22,451)**	**$ (2,329)**	**$ 1,227**	**$ 744**	**$ (722)**	**$ (2,793)**	**$ (4,634)**	**$ (5,791)**	**$ (6,242)**	**$ (6,315)**	**$ (6,327)**	**$ (6,327)**

NPV

3-year	**($181,872)**
5-year	**($182,701)**
10-year	**($188,162)**

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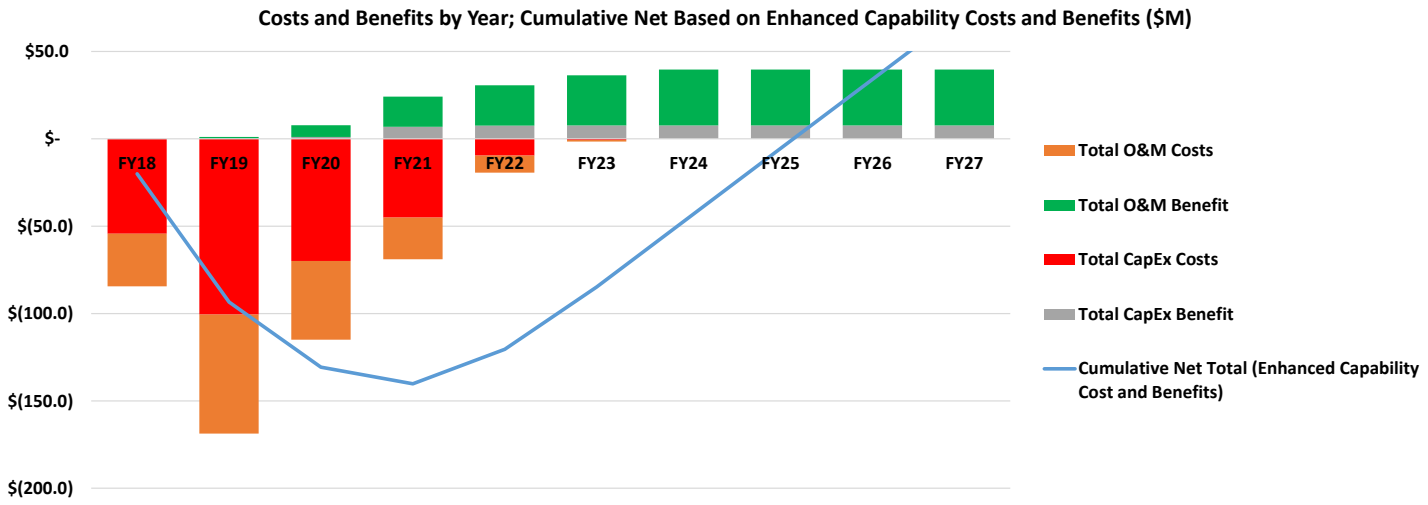
Cost Benefit Chart Option 4

		3	4	5	6	7	8	9	10	11	12	
Total Summary	**Category**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**Cumulative Total**
50	Total O&M Benefit	$ -	$ 1.0	$ 6.7	$ 17.3	$ 23.1	$ 28.8	$ 32.0	$ 32.0	$ 32.0	$ 32.0	$ 205
50	Total O&M Costs	$ (30.2)	$ (68.2)	$ (45.1)	$ (23.9)	$ (9.8)	$ (0.8)	$ -	$ -	$ -	$ -	$ (178)
50	Total CapEx Benefit	$ -	$ 0.1	$ 1.0	$ 6.9	$ 7.6	$ 7.6	$ 7.6	$ 7.6	$ 7.6	$ 7.6	$ 54
	Total CapEx Costs	$ (54.3)	$ (100.5)	$ (69.9)	$ (45.1)	$ (9.6)	$ (0.7)	$ -	$ -	$ -	$ -	$ (280)
	Cumulative O&M	$ (0.0)	$ (0.1)	$ (0.0)	$ (0.0)	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
	Cumulative CapEx	$ (0.1)	$ (0.1)	$ (0.1)	$ (0.0)	$ (0.0)	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ (0)
	Total Benefits	$ -	$ 1.0	$ 7.8	$ 24.2	$ 30.7	$ 36.4	$ 39.6	$ 39.6	$ 39.6	$ 39.6	$ 259
	Total Costs	$ (84.5)	$ (168.7)	$ (115.0)	$ (68.9)	$ (19.4)	$ (1.5)	$ -	$ -	$ -	$ -	$ (458)
		$ (20.0)	$ (74.5)	$ (45.1)	$ (33.7)	$ (10.9)	$ (0.7)	$ -	$ -	$ -	$ -	$ (185)
	Cumulative Net Total (Enhanced	**$ (20.0)**	**$ (93.4)**	**$ (130.8)**	**$ (140.2)**	**$ (120.5)**	**$ (84.8)**	**$ (45)**	**$ (6)**	**$ 34**	**$ 74**	**$ 74**



INPUTS

Inputs and Assumptions

Finance Inputs		
Discount Rate	After-tax WA	9.98%
Corporate Tax Rate	Marginal Co	40.00%
Base Year	Base Year	2018

Depreciation Assumptions	
Category - Depreciation	**Composite**
Hardware - Book	2.9%
Hardware - MACRS	5
Software - Book	2.9%
Software - MACRS	7
Plant & Machinery - Book	2.9%
Plant & Machinery - MACRS	20

Column Index	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MACRS - Useful Life	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**FY33**	**FY34**	**FY35**	**FY36**	**FY37**
3	33.3%	44.5%	14.8%	7.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	20.0%	32.0%	19.2%	11.5%	11.5%	5.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7	14.3%	24.5%	17.5%	12.5%	8.9%	8.9%	8.9%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	10.0%	18.0%	14.4%	11.5%	9.2%	7.4%	6.6%	6.6%	6.6%	6.6%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15	5.0%	9.5%	8.6%	7.7%	6.9%	6.2%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	3.0%	0.0%	0.0%	0.0%	0.0%
20	3.8%	7.2%	6.7%	6.2%	5.7%	5.3%	4.9%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
39	2.5%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%

NOTE: MACRS assumes half-year convention

FINANCIAL SUMMARY

Insert Summary Tab Output Here - COSTS

		Values										
Workstream	**Engine Category**	**Sum of FY2018**	**Sum of FY2019**	**Sum of FY2020**	**Sum of FY2021**	**Sum of FY2022**	**Sum of FY2023**	**Sum of FY2024**	**Sum of FY2025**	**Sum of FY2026**	**Sum of 10 yr FY Total**	
Backbone	Software O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Hardware O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Contractor O&M	($3,400)	($10,200)	($6,800)	$0	$0	$0	$0	$0	$0	($20,400)	
	ExternalApplication Maintenance ProviderOnshore O&M	($15)	($95)	($12)	($12)	$0	$0	$0	$0	$0	($135)	
	ExternalApplication Maintenance ProviderOffshore O&M	$0	($20)	$0	$0	$0	$0	$0	$0	$0	($20)	
	ExternalBusiness/Management ConsultantOnshore O&M	($2,048)	($2,260)	($2,176)	($1,534)	($402)	$0	$0	$0	$0	($8,420)	
	ExternalBusiness/Management ConsultantOffshore O&M	($74)	$0	$0	$0	$0	$0	$0	$0	$0	($74)	
	ExternalSystem IntegratorOnshore O&M	($3,051)	($5,274)	($3,579)	($2,822)	($668)	($140)	$0	$0	$0	($15,535)	
	ExternalSystem IntegratorOffshore O&M	($405)	($1,715)	($1,086)	($805)	($460)	($11)	$0	$0	$0	($4,482)	
	InternalClient ExecutiveOnshore O&M	($1,569)	($2,636)	($2,810)	($1,110)	($122)	$0	$0	$0	$0	($8,248)	
	InternalClient Business - Non ExecutiveOnshore O&M	($1,735)	($3,546)	($3,933)	($3,764)	($2,510)	$0	$0	$0	$0	($15,487)	
	InternalClient IS - Non ExecutiveOnshore O&M	($983)	($2,139)	($2,122)	($2,510)	($806)	$0	$0	$0	$0	($8,560)	
	Expenses O&M	($869)	($1,297)	($981)	($743)	($182)	($24)	$0	$0	$0	($4,095)	
	Software	($21,063)	($6,313)	($2,980)	($1,148)	$0	$0	$0	$0	$0	($31,503)	
	Hardware	($2,162)	($5,340)	($3,603)	$0	$0	$0	$0	$0	$0	($11,105)	
	Contractor CapEx	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalApplication Maintenance ProviderOnshore CapEx	($61)	($852)	($112)	($112)	$0	$0	$0	$0	$0	($1,137)	
	ExternalApplication Maintenance ProviderOffshore CapEx	($951)	($2,012)	($149)	$0	$0	$0	$0	$0	$0	($3,112)	
	ExternalBusiness/Management ConsultantOnshore CapEx	($3,916)	($3,368)	($2,277)	($332)	($56)	$0	$0	$0	$0	($9,949)	
	ExternalBusiness/Management ConsultantOffshore CapEx	($372)	$0	$0	$0	$0	$0	$0	$0	$0	($372)	
	ExternalSystem IntegratorOnshore CapEx	($11,576)	($25,856)	($21,760)	($11,160)	($1,857)	($561)	$0	$0	$0	($72,770)	
	ExternalSystem IntegratorOffshore CapEx	($3,022)	($7,343)	($4,717)	($3,469)	($485)	($43)	$0	$0	$0	($19,079)	
	InternalClient ExecutiveOnshore CapEx	($1,231)	($2,022)	($2,695)	($911)	($161)	$0	$0	$0	$0	($7,020)	
	InternalClient Business - Non ExecutiveOnshore CapEx	($2,029)	($2,811)	($2,192)	($850)	($133)	$0	$0	$0	$0	($8,015)	
	InternalClient IS - Non ExecutiveOnshore CapEx	($1,306)	($4,061)	($1,851)	($1,999)	($330)	$0	$0	$0	$0	($9,547)	
	Expenses CapEx	($2,644)	($5,113)	($4,105)	($1,973)	($325)	($95)	$0	$0	$0	($14,255)	
Backbone Total		**($64,482)**	**($94,273)**	**($69,942)**	**($35,253)**	**($8,496)**	**($875)**	$0	$0	$0	**($273,320)**	60%
Performance	Software O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Hardware O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Contractor O&M	($3,150)	($10,152)	($6,823)	($500)	$0	$0	$0	$0	$0	($20,625)	
	ExternalApplication Maintenance ProviderOnshore O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalApplication Maintenance ProviderOffshore O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalBusiness/Management ConsultantOnshore O&M	($5,818)	($13,700)	($4,272)	($1,780)	($793)	($121)	$0	$0	$0	($26,483)	
	ExternalBusiness/Management ConsultantOffshore O&M	$0	($766)	$0	$0	$0	$0	$0	$0	$0	($766)	
	ExternalSystem IntegratorOnshore O&M	($661)	($354)	($630)	($954)	($750)	$0	$0	$0	$0	($3,348)	
	ExternalSystem IntegratorOffshore O&M	($20)	($71)	($108)	($231)	($74)	$0	$0	$0	$0	($505)	
	InternalClient ExecutiveOnshore O&M	($636)	($2,197)	($1,739)	($909)	($83)	$0	$0	$0	$0	($5,563)	
	InternalClient Business - Non ExecutiveOnshore O&M	($1,979)	($4,325)	($2,417)	($1,900)	($1,647)	($413)	$0	$0	$0	($12,682)	
	InternalClient IS - Non ExecutiveOnshore O&M	($458)	($966)	($1,015)	($1,277)	($329)	$0	$0	$0	$0	($4,045)	
	Expenses O&M	($1,101)	($2,389)	($833)	($465)	($262)	($21)	$0	$0	$0	($5,071)	
	Software	($2,900)	($2,850)	($1,100)	($1,350)	($50)	$0	$0	$0	$0	($8,250)	
	Hardware	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	Contractor CapEx	$0	($21,880)	($8,995)	$0	$0	$0	$0	$0	$0	($30,875)	
	ExternalApplication Maintenance ProviderOnshore CapEx	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalApplication Maintenance ProviderOffshore CapEx	($300)	($643)	($55)	$0	$0	$0	$0	$0	$0	($998)	
	ExternalBusiness/Management ConsultantOnshore CapEx	($1,136)	($2,157)	($1,462)	($2,674)	($262)	($40)	$0	$0	$0	($7,730)	
	ExternalBusiness/Management ConsultantOffshore CapEx	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	ExternalSystem IntegratorOnshore CapEx	($447)	($6,238)	($8,988)	($11,513)	($3,625)	$0	$0	$0	$0	($30,811)	
	ExternalSystem IntegratorOffshore CapEx	($221)	($1,188)	($1,320)	($2,566)	($711)	$0	$0	$0	$0	($6,006)	
	InternalClient ExecutiveOnshore CapEx	($249)	($780)	($827)	($778)	($170)	$0	$0	$0	$0	($2,805)	
	InternalClient Business - Non ExecutiveOnshore CapEx	($323)	($1,002)	($1,261)	($2,460)	($928)	($68)	$0	$0	$0	($6,042)	
	InternalClient IS - Non ExecutiveOnshore CapEx	($325)	($1,385)	($1,467)	($1,907)	($578)	$0	$0	$0	$0	($5,663)	
	Expenses CapEx	($269)	($1,427)	($1,777)	($2,412)	($661)	($7)	$0	$0	$0	($6,552)	
Performance Total		**($19,994)**	**($74,468)**	**($45,089)**	**($33,677)**	**($10,924)**	**($669)**	$0	$0	$0	**($184,821)**	40%
										Total	**($458,141)**	

% of Total Investment	**Support**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**Total**
60%	Backbone	$0	($854)	($4,239)	($9,211)	($10,933)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($130,688)
40%	Performance	$0	($577)	($2,866)	($6,229)	($7,393)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($88,372)
	Total	**$0**	**($1,431)**	**($7,105)**	**($15,440)**	**($18,327)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($17,676)**	**($219,060)**

Output for Financial Summary

Backbone	O&M	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	Total	
	Labor		($9,880)	($17,685)	($15,720)	($12,558)	($4,967)	($151)	$0	$0	$0							($60,961)	
	Contractor / 3rd Party		($3,400)	($10,200)	($6,800)	$0	$0	$0	$0	$0	$0							($20,400)	
	Program Expenses		($869)	($1,297)	($981)	($743)	($182)	($24)	$0	$0	$0							($4,095)	
	HW/SW Support		$0	($854)	($4,239)	($9,211)	($10,933)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($10,545)	($130,688)	
	Total O&M		**($14,149)**	**($30,036)**	**($27,740)**	**($22,512)**	**($16,082)**	**($10,720)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($10,545)**	**($216,144)**	
	CapEx	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**Total**	
	Labor		($24,464)	($48,325)	($35,753)	($18,833)	($3,021)	($604)	$0	$0	$0							($131,000)	
	Contractor / 3rd Party		$0	$0	$0	$0	$0	$0	$0	$0	$0							$0	
	Program Expenses		($2,644)	($5,113)	($4,105)	($1,973)	($325)	($95)	$0	$0	$0							($14,255)	
	Software		($21,063)	($6,313)	($2,980)	($1,148)	$0	$0	$0	$0	$0							($31,503)	
	Hardware		($2,162)	($5,340)	($3,603)	$0	$0	$0	$0	$0	$0							($11,105)	
	Total CapEx		**($50,333)**	**($65,091)**	**($46,441)**	**($21,953)**	**($3,347)**	**($700)**	**$0**	**$0**	**$0**							**($187,864)**	**($404,008)**
Performance	**O&M**	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**Total**		
	Labor		($9,571)	($22,379)	($10,181)	($7,052)	($3,676)	($534)	$0	$0	$0							($53,393)	
	Contractor / 3rd Party		($3,150)	($10,152)	($6,823)	($500)	$0	$0	$0	$0	$0							($20,625)	
	Program Expenses		($1,101)	($2,389)	($833)	($465)	($262)	($21)	$0	$0	$0							($5,071)	
	HW/SW Support		$0	($577)	($2,866)	($6,229)	($7,393)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($7,131)	($88,372)	
	Total O&M		**($13,823)**	**($35,497)**	**($20,704)**	**($14,245)**	**($11,332)**	**($7,685)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($7,131)**	**($167,461)**	
	CapEx	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**Total**		
	Labor		($3,002)	($13,392)	($15,380)	($21,898)	($6,274)	($108)	$0	$0	$0							($60,055)	
	Contractor / 3rd Party		$0	($21,880)	($8,995)	$0	$0	$0	$0	$0	$0							($30,875)	
	Program Expenses		($269)	($1,427)	($1,777)	($2,412)	($661)	($7)	$0	$0	$0							($6,552)	
	Software		($2,900)	($2,850)	($1,100)	($1,350)	($50)	$0	$0	$0	$0							($8,250)	
	Hardware		$0	$0	$0	$0	$0	$0	$0	$0	$0							$0	
	Total CapEx		**($6,171)**	**($39,549)**	**($27,252)**	**($25,660)**	**($6,985)**	**($115)**	**$0**	**$0**	**$0**							**($105,732)**	**($273,193)**

Insert Benefits Pivot Tab Output Here - BENEFITS

Row Labels	Sum of FY18	Sum of FY19	Sum of FY20	Sum of FY21	Sum of FY22	Sum of FY23	Sum of FY24	Sum of FY25	Sum of FY26
Business Case	**$ -**	**$ 1,019,663**	**$ 7,772,492**	**$ 24,198,128**	**$ 30,674,982**	**$ 36,394,237**	**$ 39,615,248**	**$ 39,615,248**	**$ 39,615,248**
CapEx	**$ -**	**$ 64,492**	**$ 1,035,024**	**$ 6,877,076**	**$ 7,597,590**	**$ 7,642,045**	**$ 7,646,267**	**$ 7,646,267**	**$ 7,646,267**
Capacity Savings	$ -	$ -	$ 730,941	$ 4,695,659	$ 5,109,256	$ 5,152,038	$ 5,155,571	$ 5,155,571	$ 5,155,571
Compliance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Spend Reduction	$ -	$ 64,492	$ 304,084	$ 2,181,417	$ 2,488,334	$ 2,490,007	$ 2,490,696	$ 2,490,696	$ 2,490,696
O&M	**$ -**	**$ 955,171**	**$ 6,737,467**	**$ 17,321,052**	**$ 23,077,392**	**$ 28,752,191**	**$ 31,968,981**	**$ 31,968,981**	**$ 31,968,981**
Capacity Savings	$ -	$ -	$ 1,242,009	$ 6,990,064	$ 7,814,124	$ 8,486,199	$ 8,721,575	$ 8,721,575	$ 8,721,575
Compliance	$ -	$ 876,348	$ 5,070,300	$ 9,577,233	$ 13,253,652	$ 16,738,568	$ 19,406,399	$ 19,406,399	$ 19,406,399
Spend Reduction	$ -	$ 78,823	$ 425,159	$ 753,755	$ 2,009,616	$ 3,527,424	$ 3,841,007	$ 3,841,007	$ 3,841,007
Grand Total	**$ -**	**$ 1,019,663**	**$ 7,772,492**	**$ 24,198,128**	**$ 30,674,982**	**$ 36,394,237**	**$ 39,615,248**	**$ 39,615,248**	**$ 39,615,248**

Output for Financial Summary

Row Labels	Sum of FY18	Sum of FY19	Sum of FY20	Sum of FY21	Sum of FY22	Sum of FY23	Sum of FY24	Sum of FY25	Sum of FY26	FY27	FY28	FY29	FY30	FY31	FY32
Business Case	**$ -**	**$ 1,020**	**$ 7,772**	**$ 24,198**	**$ 30,675**	**$ 36,394**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**
CapEx	**$ -**	**$ 64**	**$ 1,035**	**$ 6,877**	**$ 7,598**	**$ 7,642**	**$ 7,646**	**$ 7,646**	**$ 7,646**	**$ 7,646**	**$ 7,646**	**$ 7,646**	**$ 7,646**	**$ 7,646**	**$ 7,646**
Capacity Savings	$ -	$ -	$ 731	$ 4,696	$ 5,109	$ 5,152	$ 5,156	$ 5,156	$ 5,156	$ 5,156	$ 5,156	$ 5,156	$ 5,156	$ 5,156	$ 5,156
Compliance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Spend Reduction	$ -	$ 64	$ 304	$ 2,181	$ 2,488	$ 2,490	$ 2,491	$ 2,491	$ 2,491	$ 2,491	$ 2,491	$ 2,491	$ 2,491	$ 2,491	$ 2,491
O&M	**$ -**	**$ 955**	**$ 6,737**	**$ 17,321**	**$ 23,077**	**$ 28,752**	**$ 31,969**	**$ 31,969**	**$ 31,969**	**$ 31,969**	**$ 31,969**	**$ 31,969**	**$ 31,969**	**$ 31,969**	**$ 31,969**
Capacity Savings	$ -	$ -	$ 1,242	$ 6,990	$ 7,814	$ 8,486	$ 8,722	$ 8,722	$ 8,722	$ 8,722	$ 8,722	$ 8,722	$ 8,722	$ 8,722	$ 8,722
Compliance	$ -	$ 876	$ 5,070	$ 9,577	$ 13,254	$ 16,739	$ 19,406	$ 19,406	$ 19,406	$ 19,406	$ 19,406	$ 19,406	$ 19,406	$ 19,406	$ 19,406
Spend Reduction	$ -	$ 79	$ 425	$ 754	$ 2,010	$ 3,527	$ 3,841	$ 3,841	$ 3,841	$ 3,841	$ 3,841	$ 3,841	$ 3,841	$ 3,841	$ 3,841
Grand Total	**$ -**	**$ 1,020**	**$ 7,772**	**$ 24,198**	**$ 30,675**	**$ 36,394**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**	**$ 39,615**

Depreciation

	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Net Capex															
Hardware	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Software Capex															
Software Licenses	(2,900)	(2,850)	(1,100)	(1,350)	(50)	-	-	-	-	-	-	-	-	-	-
Labor	(3,002)	(13,392)	(15,380)	(21,898)	(6,274)	(108)	-	-	-	-	-	-	-	-	-
Contractor / 3rd Party	-	(21,880)	(8,995)	-	-	-	-	-	-	-	-	-	-	-	-
Program Expenses	(269)	(1,427)	(1,777)	(2,412)	(661)	(7)	-	-	-	-	-	-	-	-	-
Software Total	(6,171)	(39,549)	(27,252)	(25,660)	(6,985)	(115)	-	-	-	-	-	-	-	-	-
Plant & Machinery (Benefits)	-	64	1,035	6,877	7,598	7,642	7,646	7,646	7,646	7,646	7,646	7,646	7,646	7,646	7,646
Total	**(6,171)**	**(39,484)**	**(26,217)**	**(18,783)**	**612**	**7,527**	**7,646**	**7,646**	**7,646**	**7,646**	**7,646**	**7,646**	**7,646**	**7,646**	**7,646**

Depreciation

Software - Book	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Year															
Year 1	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)	(179)
Year 2		(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)	(1,147)
Year 3			(790)	(790)	(790)	(790)	(790)	(790)	(790)	(790)	(790)	(790)	(790)	(790)	(790)
Year 4				(744)	(744)	(744)	(744)	(744)	(744)	(744)	(744)	(744)	(744)	(744)	(744)
Year 5					(203)	(203)	(203)	(203)	(203)	(203)	(203)	(203)	(203)	(203)	(203)
Year 6						(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Year 7							-	-	-	-	-	-	-	-	-
Year 8								-	-	-	-	-	-	-	-
Year 9									-	-	-	-	-	-	-
Year 10										-	-	-	-	-	-
Year 11											-	-	-	-	-
Year 12												-	-	-	-
Year 13													-	-	-
Year 14														-	-
Year 15															-
Total Book Depreciation	**(179)**	**(1,326)**	**(2,116)**	**(2,860)**	**(3,063)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**	**(3,066)**

Hardware - Book	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Year															
Year 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Year 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Year 3			-	-	-	-	-	-	-	-	-	-	-	-	-
Year 4				-	-	-	-	-	-	-	-	-	-	-	-
Year 5					-	-	-	-	-	-	-	-	-	-	-
Year 6						-	-	-	-	-	-	-	-	-	-
Year 7							-	-	-	-	-	-	-	-	-
Year 8								-	-	-	-	-	-	-	-
Year 9									-	-	-	-	-	-	-
Year 10										-	-	-	-	-	-
Year 11											-	-	-	-	-
Year 12												-	-	-	-
Year 13													-	-	-
Year 14														-	-
Year 15															-
Total Book Depreciation	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Plant & Machinery - Book	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Year															
Year 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Year 2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Year 3			30	30	30	30	30	30	30	30	30	30	30	30	30
Year 4				199	199	199	199	199	199	199	199	199	199	199	199
Year 5					220	220	220	220	220	220	220	220	220	220	220
Year 6						222	222	222	222	222	222	222	222	222	222
Year 7							222	222	222	222	222	222	222	222	222
Year 8								222	222	222	222	222	222	222	222
Year 9									222	222	222	222	222	222	222
Year 10										222	222	222	222	222	222
Year 11											222	222	222	222	222
Year 12												222	222	222	222
Year 13													222	222	222
Year 14														222	222
Year 15															222
Total Book Depreciation	**-**	**2**	**32**	**231**	**452**	**673**	**895**	**1,117**	**1,338**	**1,560**	**1,782**	**2,004**	**2,225**	**2,447**	**2,669**

Software - MACRS															
Years	7	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Year																
Year 1		(882)	(1,511)	(1,079)	(771)	(551)	(550)	(551)	(275)	-	-	-	-	-	-	-
Year 2			(5,651)	(9,685)	(6,917)	(4,940)	(3,532)	(3,528)	(3,532)	(1,764)	-	-	-	-	-	-
Year 3				(3,894)	(6,674)	(4,766)	(3,404)	(2,434)	(2,431)	(2,434)	(1,215)	-	-	-	-	-
Year 4					(3,667)	(6,284)	(4,488)	(3,205)	(2,291)	(2,289)	(2,291)	(1,144)	-	-	-	-
Year 5						(998)	(1,711)	(1,222)	(872)	(624)	(623)	(624)	(312)	-	-	-
Year 6							(16)	(28)	(20)	(14)	(10)	(10)	(10)	(5)	-	-
Year 7								-	-	-	-	-	-	-	-	-
Year 8									-	-	-	-	-	-	-	-
Year 9										-	-	-	-	-	-	-
Year 10											-	-	-	-	-	-
Year 11												-	-	-	-	-
Year 12													-	-	-	-
Year 13														-	-	-
Year 14															-	-
Year 15																-
Total MACRS Depreciation		**(882)**	**(7,163)**	**(14,659)**	**(18,029)**	**(17,539)**	**(13,701)**	**(10,967)**	**(9,422)**	**(7,124)**	**(4,140)**	**(1,778)**	**(322)**	**(5)**	**-**	**-**

Hardware - MACRS

Years	5	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
	Year															
	Year 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 3			-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 4				-	-	-	-	-	-	-	-	-	-	-	-
	Year 5					-	-	-	-	-	-	-	-	-	-	-
	Year 6						-	-	-	-	-	-	-	-	-	-
	Year 7							-	-	-	-	-	-	-	-	-
	Year 8								-	-	-	-	-	-	-	-
	Year 9									-	-	-	-	-	-	-
	Year 10										-	-	-	-	-	-
	Year 11											-	-	-	-	-
	Year 12												-	-	-	-
	Year 13													-	-	-
	Year 14														-	-
	Year 15															-
	Total MACRS Depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Plant & Machinery - MACRS

Years	20	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
	Year															
	Year 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Year 2		2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Year 3			69	64	59	55	51	47	46	46	46	46	46	46	46
	Year 4				425	393	363	336	311	307	307	307	307	307	307	307
	Year 5					434	402	371	344	339	339	339	339	339	339	339
	Year 6						404	374	346	341	341	341	341	341	341	341
	Year 7							374	346	341	341	341	341	341	341	341
	Year 8								346	341	341	341	341	341	341	341
	Year 9									341	341	341	341	341	341	341
	Year 10										341	341	341	341	341	341
	Year 11											341	341	341	341	341
	Year 12												341	341	341	341
	Year 13													341	341	341
	Year 14														341	341
	Year 15															341
	Total MACRS Depreciation	-	2	72	491	888	1,226	1,508	1,741	2,059	2,400	2,741	3,082	3,424	3,764	4,106
	Total Book	(179)	(1,324)	(2,084)	(2,629)	(2,611)	(2,393)	(2,171)	(1,949)	(1,728)	(1,506)	(1,284)	(1,063)	(841)	(619)	(397)
	Total MACRS	(882)	(7,160)	(14,588)	(17,537)	(16,651)	(12,475)	(9,459)	(7,681)	(5,066)	(1,741)	963	2,760	3,419	3,764	4,106
	MACRS less Book Depreciation	(703)	(5,836)	(12,503)	(14,908)	(14,040)	(10,082)	(7,288)	(5,731)	(3,338)	(235)	2,247	3,822	4,259	4,383	4,503

Free Cash Flow - Option 4

($000)

		Type	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Opex Benefits																	
	Capacity Savings		-	-	1,242	6,990	7,814	8,486	8,722	8,722	8,722	8,722	8,722	8,722	8,722	8,722	8,722
	Compliance		-	876	5,070	9,577	13,254	16,739	19,406	19,406	19,406	19,406	19,406	19,406	19,406	19,406	19,406
	Spend Reduction		-	79	425	754	2,010	3,527	3,841	3,841	3,841	3,841	3,841	3,841	3,841	3,841	3,841
Total Opex Benefits			-	955	6,737	17,321	23,077	28,752	31,969	31,969	31,969	31,969	31,969	31,969	31,969	31,969	31,969
Opex Expenses																	
	Labor	Investment	(9,571)	(22,379)	(10,181)	(7,052)	(3,676)	(534)	-	-	-	-	-	-	-	-	-
	Contractor / 3rd Part	Investment	(3,150)	(10,152)	(6,823)	(500)	-	-	-	-	-	-	-	-	-	-	-
	Program Expenses	Investment	(1,101)	(2,389)	(833)	(465)	(262)	(21)	-	-	-	-	-	-	-	-	-
	SW / HW Support	Maintenanc	-	(577)	(2,866)	(6,229)	(7,393)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)
Total Opex Expenses			(13,823)	(35,497)	(20,704)	(14,245)	(11,332)	(7,685)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)
EBITDA			**(13,823)**	**(34,542)**	**(13,966)**	**3,076**	**11,746**	**21,067**	**24,838**	**24,838**	**24,838**	**24,838**	**24,838**	**24,838**	**24,838**	**24,838**	**24,838**
Depreciation (Book, Net)			(179)	(1,324)	(2,084)	(2,629)	(2,611)	(2,393)	(2,171)	(1,949)	(1,728)	(1,506)	(1,284)	(1,063)	(841)	(619)	(397)
EBIT			**(14,002)**	**(35,866)**	**(16,051)**	**447**	**9,135**	**18,674**	**22,667**	**22,889**	**23,111**	**23,332**	**23,554**	**23,776**	**23,998**	**24,219**	**24,441**
Income Taxes			5,601	14,346	6,420	(179)	(3,654)	(7,470)	(9,067)	(9,156)	(9,244)	(9,333)	(9,422)	(9,510)	(9,599)	(9,688)	(9,776)
Net Income			**(8,401)**	**(21,520)**	**(9,630)**	**268**	**5,481**	**11,205**	**13,600**	**13,733**	**13,866**	**13,999**	**14,132**	**14,265**	**14,399**	**14,532**	**14,665**
Depreciation (Book, Net)			179	1,324	2,084	2,629	2,611	2,393	2,171	1,949	1,728	1,506	1,284	1,063	841	619	397
Net Capex			(6,171)	(39,484)	(26,217)	(18,783)	612	7,527	7,646	7,646	7,646	7,646	7,646	7,646	7,646	7,646	7,646
Deferred Income Taxes			281	2,335	5,001	5,963	5,616	4,033	2,915	2,293	1,335	94	(899)	(1,529)	(1,704)	(1,753)	(1,801)
Free Cash Flow			**$ (14,112)**	**$ (57,345)**	**$ (28,762)**	**$ (9,923)**	**$ 14,320**	**$ 25,157**	**$ 26,333**	**$ 25,622**	**$ 24,575**	**$ 23,246**	**$ 22,164**	**$ 21,445**	**$ 21,182**	**$ 21,044**	**$ 20,907**

NPV	
3-year	**$16,004**
5-year	**$41,427**
10-year	**$99,389**

Terminal Value Calculation	
Average 15 Year Cash Flows*	**$ 9,057**
Cost/Benefit Growth Rate**	**2.00%**
Rate of Return	**9.98%**
Terminal Value	**$ 113,495**

* Terminal value average cash flows assumes the solution will need to be replaced every 15 years to maintain the benefit stream; terminal value annual cash flow is the average annual free cash flow over the 15 year period from FY18 to FY32.
** Growth rate is equivalent to the rate of inflation

Date of Request: July 19, 2017 EDF Request No. EDF-1 NK-4
Due Date: July 31, 2017 NMPC Req. No. NM-1229

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: Environmental Defense Fund, Natalie Karas

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: ***GAS INFRASTRUCTURE AND OPERATIONS PANEL***

Request:

4. Refer to page 91 of the GIOP panel testimony, which provides: "Specifically, the core systems GBE will design, standardize, and implement include: [...] an Asset Investment Planning and Management tool (*i.e.*, software application) to perform asset condition assessment and risk ranking/prioritization of asset replacement." Please describe the factors that will be considered by this tool in performing asset condition assessment and risk ranking/prioritization of asset replacement.

Response:

4. Key inputs to the asset condition investment and risk ranking/prioritization, which will be included in the new Integrity Management (IM) platforms, integrated with Enterprise Asset Management, Work Management, and Graphical Information System platforms will include, but are not necessarily limited to:

    - asset classification information such as asset age, material, and criticality of asset;
    - asset condition information such as prior failure/leak history, operating pressure, environmental impact, and maintenance history;
    - asset location information such as soil/ground conditions, number of customers served, and proximity to buildings;
    - ability to bundle work within and outside the asset management framework;

- lead times and permitting requirements; and
- asset replacement cost.

Deployment of this tool will dramatically improve the Company's ability to leverage the most current asset information and field conditions when prioritizing investments and managing asset performance.

Name of Respondent:
Johnny Johnston

Date of Reply:
July 27, 2017

Date of Request: July 19, 2017 EDF Request No. EDF-1 NK-5
Due Date: July 31, 2017 NMPC Req. No. NM-1230

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: Environmental Defense Fund, Natalie Karas

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: ***GAS INFRASTRUCTURE AND OPERATIONS PANEL***

Request:

5. Refer to pages 91 and 92 of the GIOP panel testimony, which provides: "In addition, updating and integrating these core system will enable new tools such as a mobility solution for leak investigation and inspection work orders; drive improvement in gas safety performance; improve capital delivery effectiveness; and lead to better employee utilization, and ultimately customer service."

   a. Please describe in full the "mobility solution for leak investigation."

   b. Does the Company have a plan or timeline for use of such tools using the newly deployed system?

Response:

a. The mobility solution for leak investigation will replace the existing MWORK field mobility tool. The new mobility solution will include a new handheld device, replacing the truck-mounted equipment in use today. When a call is received regarding a gas odor or other potential leak hazard, an order will be created in the new systems. Dispatchers will have a map view of work and resources to ensure that orders are assigned and dispatched to the most appropriate resource in a timely manner. The field worker will receive and confirm the order, thus capturing the time stamp for regulatory reporting. The field worker will also have access to directions to the job location, if necessary. When the issue is reported at a site that is not a customer address, the GPS location or the nearest customer address will be displayed on the map.

While the technician is onsite, he or she will capture onsite arrival time and all other relevant information including readings inside and out on the handheld device. If the issue requires a minor repair, the field worker will perform the repair and capture work done via the handheld device as well. Ultimately, the technician will be able to capture the leak investigation information on the handheld device rather than the paper forms and drawings used today. If a crew is needed for underground repair, the technician will easily be able to communicate with dispatch and ultimately with the crew. Information on the job will be electronically transferred from the technician to the crew so that they have the latest information. Dispatch will see the crews in the area via map, in the same view seen by the field supervisors. If the investigation determines there is no need for an immediate repair, but there is a need for follow-up, the order completion process will allow future follow-up to be scheduled, as necessary. All information captured in the field will immediately be available for supervisor review. All information will be captured and remain available for query by system users, including those in the call center and other crews completing future inspections or repairs.

b. The first implementation of this leak investigation capability will be in Rhode Island in October 2018. Additional rollouts to the other jurisdictions will occur through October 2019, with Niagara Mohawk receiving the capability in April 2019.

Name of Respondent:	Date of Reply:
Johnny Johnston	July 27, 2017

Date of Request: July 19, 2017 EDF Request No. EDF-1 NK-6
Due Date: July 31, 2017 NMPC Req. No. NM-1231

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: Environmental Defense Fund, Natalie Karas

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: ***GAS INFRASTRUCTURE AND OPERATIONS PANEL***

Request:

6. Refer to pages 93 and 94 of the GIOP panel testimony, which provides: "National Grid worked with two of the top system integrators in the U.S., Accenture and PWC, to complete a high-level design and develop a roadmap that leverages modern system implementation approaches to minimize risk and maximize the likelihood that the desired business outcomes are successfully delivered. Detailed design and project implementation will also be supported by a system integrator consultant experienced with similar, large-scale implementations." Please provide the design and roadmap developed by National Grid in association with Accenture and PwC.

Response:

6. Attachment 1 is the roadmap and design for the Gas Business Enablement ("GBE") Program. The roadmap is phased and prioritized over five years to reduce operational risk while balancing deliverability and accelerating value creation where possible. The initiatives and their rollout reflected in the roadmap were developed during the Strategic Assessment Phase of the Program in close collaboration with Accenture with input, oversight, and validation by National Grid's GBE team, comprised of experienced leaders from across the business including Operations, Procurement, Contact Center, Dispatch, Customer Meter Services, Supply Chain, Information Services, and Human Resources. PwC also served as a Design Assurance partner to review and validate the completeness and deliverability of the GBE roadmap.

Name of Respondent: Date of Reply:
Johnny Johnston July 27, 2017

Gas Business Enablement Program Roadmap

Work Stream	Initiative	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18	Oct-18	Jan-19	Apr-19	Jul-19	Oct-19	Jan-20	Apr-20	Jul-20	Oct-20	Jan-21	Apr-21	Jul-21	Oct-21	Jan-22	Apr-22	Jul-22	Oct-22	Jan-23
						NIMO		MA		RI						KEDLI/ KEDNY										
		FY 17	Fiscal Year 18				Fiscal Year 19				Fiscal Year 20				Fiscal Year 21				Fiscal Year 22				Fiscal Year 23			
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
PrfMO	**Gas Business Enablement Portfolio Management Office**																									
PrfMO	Software Finalization (RFP)																									
PrfMO	Mobilization																									
PrfMO	Portfolio Management Leadership																									
SA	**Solution Architects & Agile Coaches**																									
BR	**Program Level People Strategy**																									
BR	Program Transformational Change Office															Internal only										
BR	Program Learning Management															Internal only										
BR	Agile Change Management CoE Strategy																									
BR	Workforce Strategy Planning & Implementation Support																									
BR	Labor Contract Strategy & Implementation Support																									
BR	**Operating Model & Value Framework**																									
BR	Business Architecture - Organization Design & Transition																									
BR	Operations Performance, Governance & Value Realization																									
BR	Future State Culture Definition																									
BR	Leadership Capability Development																									
BR	Skills/ Capability Assessment & Curriculum Redesign																									
BR	**Program Business Readiness & Sustainment**																									
BR	Program Business Readiness															Internal only										
BR	Program Business Sustainment															Internal only										
BR	Knowledge Transition & Collaboration Strategy																									
WM	**Business Architecture Design**																									
WM	**WMFE Program Leadership**																									
WM	**Work Management & Field Enablement**																									
WM	Corrosion and I&R Work							RI MA UNY NYC LI																		
WM	Company Driven Work: Collections & non-Appointment Offs						RI							MA UNY NYC LI												
WM	Customer, Leak Investigation & Inspections													RI MA UNY NYC LI												
WM	CU Governance & Library - *process*																									
WM	PowerPlan Integration & Enhancements																									
WM	Construction Work & Leak Repair													RI MA UNY NYC LI												
WM	Work Forecasting & Planning - *solution*																									
WM	WMFE Optimization																									
WM	**Projects & Program Management**																									
WM	Core Projects & Program Management																									
AM	**AM Program Leadership**																									
AM	**Engineering, Design, Estimating & Mobility**																									
AM	In-flight GIS Work																									
AM	Data Remediation, GIS Upgrade/ Migration & GIS Mobility							Model RI NYC LI UNY MA																		
AM	GIS-EAM Integration																									
AM	Design (GWD), Estimating (CU), & Mobility														RI MA UNY NYC LI											
AM	Complex Design (CAD) & Estimating (ESW)																									
AM	Design & Estimating Process Stabilization																									
AM	**AIPM**																									
AM	Initial Implementation (stand-alone)																									
AM	Enhancements																									
AM	EAM-FIN Integration																									
AM	Asset Analytics Integration																									
AM	GIS (GWD/CU) - PPM Integration																									
AM	**Integrity Management**																									
AM	Pressure Reg Station (Prelim Work)																									
AM	Risk Management (Tx Mains & Dx Mains)																									
AM	Additional IM Modules																									
AM	Integrity Management Integrations																									
AM	**Asset - Advanced Analytics**																									
AM	Use Case No.1 - Asset Risk																									
RC	**Regulatory/ Compliance**																									
RC	Document Control																									
RC	Standard Operating Procedure Documentation																									
CE	**Customer Experience Program Leadership**																									
CE	**Contact Center Front End Solution**						Timeline TBD																			
CE	**Support Interaction**																									
CE	Employee Support Interaction													RI MA UNY NYC LI												
CE	**Customer Interaction**																									
CE	Customer Interaction													RI MA UNY NYC LI												
CE	Large Commercial & Landlord Interaction																									
CE	**Supporting Through Data**																									
CE	Channel Analytics																									
CE	Campaign Management																									
CE	**Structured Experiences**																									
CE	Customer & Employee Journey Mobilization																									
SC	**Supply Chain Program Leadership**																									
SC	**SC - Business Architecture Design**																									
SC	**Integrated Supply & Demand Planning**																									
SC	Program and Project Management Planning																									
SC	Maintenance & Inspection Planning																									
SC	Construction Planning																									
SC	**Supply Chain Master Data Improvements**																									
SC	Defined Data Cleansing Approach																									
SC	Data Cleansing Execution																									
SC	**Inventory Optimization**																									
SC	Inventory Strategy																									
SC	Inventory Optimization																									
SC	**Warehousing and Network Optimization**																									
SC	Warehousing Optimization																									
SC	Networking Transportation & Optimization Analysis																									
SC	Networking Transportation & Optimization Implementation																									
SC	**Integrated Supply Feasibility Evaluation and Strategy**																									
SC	Integrated Supply Feasibility Assessment																									
DM	**Data Management & Governance Program Leadership**																									
DM	**Data Management**																									
DM	Pre GBE Deployment & Data Profiling																									
DM	Data Management Implementation (Quality & Cleansing)																									
DM	Data Enrichment Through Record Digitization																									
DM	Enable The Data Archive Process																									
DM	Building Score Cards & Metrics Capability																									
DM	Building An Advanced Analytics Capability																									
IS	**Remediation & Integration**																									
IS	Powerplan Remediation																									
IS	SAP and Application Integration Development																									
IS	**Technology Initiatives**																									
IS	Application (Environment) Infrastructure																									
IS	Mobility CoE & End-User Computing																									
IS	Operations/System Monitoring																									
IS	**Enabling Capabilities**																									
IS	Development Operations & BPA Enablement																									
IS	Testing Center of Excellence																									
IS	IS Operating Model (Delivery / Support, Run)																									
IS	Comprehensive Integration Services (Enhancements)																									

Division 7-49

Request:

Referring to the pending rate case of the Company's gas distribution affiliates in Massachusetts, Boston Gas Company and Colonial Gas Company (Gas Companies), in Department of Public Utilities docket 17-170, please provide copies of

a. all pre-filed testimony filed by the Gas Companies and any other parties in that case relating to the subject matter of the Gas Business Enablement Program,

b. all information request responses of the Gas Companies and any other parties in that case, relating to the subject matter of the Gas Business Enablement Program, and

c. any transcripts of live testimony relating to the subject matter of the Gas Business Enablement Program.

Response:

a. Please see the following attachments for the requested information:

Attachment DIV 7-49-1: Pre-filed Direct Testimony of the Gas Business Enablement Panel;

Attachment DIV 7-49-2: Pre-filed Direct Testimony of Company Witness Daniel S. Dane (Revenue Requirement witness) relating to the subject matter of the Gas Business Enablement Program;

Attachment DIV 7-49-3: Exhibit NG-DSD-2-BOS, Schedule 33; and

Attachment DIV 7-49-4: Exhibit NG-DSD-2-COL, Schedule 33.

b. Boston Gas Company, Colonial Gas Company, nor any other party has filed any responses to information requests relating to the subject matter of the Gas Business Enablement Program in the Massachusetts Department of Public Utilities Docket No. D.P.U. 17-170. The D.P.U. 17-170 is in its early stages of discovery.

c. No transcripts of live testimony relating to the subject matter of the Gas Business Enablement Program are yet available with respect to D.P.U. 17-170, pending before the Massachusetts Department of Public Utilities. The evidentiary hearings are anticipated to occur in May 2018.

Prepared by or under the supervision of: Anthony Johnston and Christopher Connolly

Boston Gas Company
Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Exhibit NG-GBE-1
November 15, 2017
H.O._____

PRE-FILED DIRECT TESTIMONY

OF

THE GAS BUSINESS ENABLEMENT PANEL

Boston Gas Company
Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Exhibit NG-GBE-1
November 15, 2017
H.O._____

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I. Introduction

Q. Mr. Johnston, please state your full name and business address.

A. My name is Anthony H. Johnston. My business address is One MetroTech Center, Brooklyn, New York 11201.

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

A. I am employed by National Grid USA Service Company, Inc., a subsidiary of National Grid USA ("National Grid"). Effective April 1, 2016, I was appointed Senior Vice President for National Grid's Gas Business Enablement ("GBE") Program. In this role, I am accountable for the design, development and delivery of the Gas Business Enablement program and its anticipated benefits.

Q. Please describe your educational background and professional experience.

A. I earned a Master of Engineering Science from Oxford University in 2002 and a Master of Business Administration from Cranfield University in 2006. I am also a Chartered Professional Engineer. I started with National Grid in 1997 and have held a number of technical positions in system operations and network design, based in the United Kingdom. I subsequently moved to the United States to join GridAmerica LLC, a wholly-owned subsidiary of National Grid based in Cleveland, OH, where I was engaged in transmission planning. In 2006, I

returned to the United Kingdom to work in National Grid's UK gas distribution business, where I was responsible for network design, including renewable gas projects. In 2010, I was promoted to the position of Vice President of Customer Operations. In this role, I had responsibility for the gas call centers, resource planning, and dispatch and mapping teams. Beginning in 2012, I served as Chief of Staff for the Company's former global Chief Executive Officer, Steve Holliday.

In 2014, I relocated to the United States as the Vice President of Customer Meter Services, where I had responsibility for more than 2,400 personnel supporting National Grid's electric and gas distribution businesses in the United States. With respect to the Massachusetts gas business, I had oversight responsibility for all field service personnel providing gas emergency response, meter-related activities (including meter installation and removal), meter reading, bill investigations, collections and other field operations related to billing. I was also responsible for overseeing the gas dispatch centers. I held this role until assuming my current position in April 2016.

Q. Have you previously testified before any regulatory commissions?

A. Yes. I submitted pre-filed testimony to the New York Public Service Commission ("NYPSC") in the 2016 KeySpan Energy Delivery NY and Long

Island ("KEDNY & KEDLI") Rate Case 16-G-0058/0059 and 2017 Niagara Mohawk Power Company ("NMPC") Rate Case 17-E-0238 and 17-G-0239.

Q. Ms. Irani-Famili, please state your full name and business address.

A. My name is Reihaneh Irani-Famili. My business address is 404 Wyman Street, Waltham, MA 02451.

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

A. I am employed by National Grid. I joined National Grid in August 2016 as Vice President of Business Readiness and Design for the GBE Program. In this role, I am responsible for readiness of the business, sustainment of the solution and defining new ways of working from governance to performance management for the gas business. To fulfill this responsibility I have a number of functions, among which is the Change Management function of GBE. Change Management involves the implementation of process and technology changes across the organization through stakeholder management, training and communication. Field Technical Training, Change Leadership and operating model design are other functions under my provision.

Q. Please describe your educational background and professional experience.

A. I earned a Master of Science in Engineering from the University of Calgary in 2004 and a Master of Business Administration from the University of Calgary in 2011. I have worked in the energy industry for approximately 16 years in various capacities. I started my career as a process engineer in the oil and gas industry in Calgary, Alberta, Canada designing gas pipelines and gas-treatment facilities, as well as thermal heavy oil production facilities and multiphase pipelines. In 2011, I became a management consultant, where I worked on developing operational excellence frameworks for the energy industry, as well as strategic assessment engagements and technology deployment initiatives for large oil companies. In 2012, I joined Devon Energy, where I led operations project teams, managed facility turnarounds, and led strategic initiatives such as capital management optimization and enterprise data management. I was then hired by National Grid in 2016 to serve in my current position.

Q. Have you previously testified before any regulatory commissions?

A. No, I have not previously testified before this or any other regulatory commission.

Q. What is the purpose of this joint testimony?

A. The purpose of this joint testimony is to present an overview of the Company's multi-year, enterprise-wide, gas-business program referred to as the Gas Business

Enablement ("GBE") program, as well as the Company's proposal for associated cost recovery. The GBE program will accomplish the implementation of three, inter-related, core operating capabilities necessary to support National Grid's U.S. gas distribution business, which are Work Management, Asset Management and Customer Enablement. National Grid estimates that it currently relies on approximately 117 sub-systems, applications, databases or spreadsheet systems across the U.S. gas business to perform the work processes that will support these capabilities. With full implementation, this number will be reduced by over 75% to less than 30 systems, sub-systems and/or applications across six gas companies operating in three jurisdictions (Massachusetts, Rhode Island and New York). In Massachusetts, specifically, National Grid estimates that implementation of the GBE program will reduce the number of systems, applications, databases and spreadsheet systems from 55 to 26. Exhibit NG-GBE-2 shows an illustrative view of the current and future state of these systems, applications, and databases.

The GBE program will accomplish a number of important, customer-focused objectives. From a functional perspective, the GBE program will streamline processes and create a single set of integrated applications for core operating systems, significantly improving the ability of employees to perform their job functions effectively. The GBE program is also designed to improve the

Company's ability to achieve and maintain compliance with state and federal regulatory requirements across all three jurisdictions by improving work management and the flow of information necessary for compliance. However, at its heart, the GBE program is aimed at improving the customer experience to meet the relatively high customer expectations that exist in today's operating environment, and which are simply not possible to meet using today's operating processes. Fundamentally, the implementation of GBE will improve the Company's ability to provide safe, reliable and cost-effective delivery of natural gas to its customers.

For reasons that we will discuss in this joint testimony, implementation of the GBE program represents a critical step-change in the Company's operating platform that will require substantial investment across all three operating jurisdictions over a multi-year period (i.e., annually through 2023). Because the annual cost of capital investment by the Service Company is charged to its operating affiliates as expense, recovering the incremental expense change in each year of the GBE program implementation will be necessary to support the program.

Accordingly, this testimony is designed to: (1) provide the Department with detailed information about the GBE program and the reasons for its implementation; and (2) support the Company's request for a rate adjustment that will allow recovery of the reasonable and prudent costs of making a step-change improvement for the direct benefit of customers.

Q. Why is it necessary for the Department to consider allowing cost recovery for the GBE program in this proceeding?

A. The total anticipated investment in GBE is approximately $478.3 million across the U.S. gas distribution business, which involves three operating jurisdictions – Massachusetts, Rhode Island and New York, serving 3.5 million gas customers. GBE will be implemented in stages starting with Rhode Island, followed by Massachusetts, then followed by NMPC in upstate New York, and finishing with KEDLI/KEDNY in downstate New York.

For the Massachusetts component, the estimated investment of $127 million will take place beginning in FY2017 and continuing through FY2023. To accomplish implementation, National Grid will incur both capital costs and operating and maintenance ("O&M") expense in each year of the program. The incremental annual cost will be significant, but will be commensurate with the value gained by customers in relation to gas safety, reliability and efficiency. Without a rate

adjustment to accommodate these year-to-year changes and support program implementation for the benefit of customers, the Company will need to consider filing a petition for a base rate case on an annual basis. For example, for Massachusetts, the incremental annual expense associated with the GBE program from FY 2017 through FY 2021[1] is projected as follows:

Fiscal Period	Revenue Requirement for Capital Costs	O&M	Estimated Total Annual Expense Charged to the Company
FY 2017		$5,123,646	$5,123,646
FY 2018	$8,245	$3,478,499	$3,486,744
FY 2019	$2,324,709	$12,620,355	$14,945,064
FY 2020	$8,600,422	$6,889,900	$15,490,342
FY 2021	$9,965,549	$2,927,167	$12,892,716
TOTAL ANNUAL EXPENSE – (2017-2021)			$51,938,512

Given the ramp-up of annual expense as the GBE program is implemented, it will be difficult to set a representative level of expense in base rates without either locking in an annual amount that is at the highpoint and inordinately large as a line item in the revenue requirement (approximately $15.4 million in FY 2020), thereby imposing rate recovery on customers that is not aligned with actual

[1] This table reflects costs to be incurred to implement the GBE program between FY2017-FY2021 in order to show the significant ramp up of costs during that time. Please note that the Company anticipates it will incur additional GBE program implementation costs through FY2023.

program costs, or locking in at an amount that understates and broadly under-collects the investment made in the GBE program. Moreover, program implementation (and the associated cost) is scheduled to commence in 2018, while this case is pending before the Department, making it difficult to capture costs in the related rate decision.

Given the overriding fact that the GBE program is a unique, transformative initiative providing direct and tangible benefits to customers, the Company is requesting the Department's consideration of a discrete cost-recovery proposal that would provide support for the program within the context of the current base-rate proceeding. Consideration of the GBE program costs in this docket is warranted and appropriate because: (1) the GBE program involves the replacement of systems that support three major, core operating capabilities on an integrated basis, rather than sequential basis, because it is cost-effective to take this approach; (2) the GBE program extends across seven gas utilities operating in three jurisdictions, with differing timelines for rate cases and rate-recovery mechanisms applying in each jurisdiction; and (3) program implementation spans a relatively extended timeline of up to five years with substantial incremental expense in each year.

As discussed below, the development of work management, asset management and customer-enablement capabilities reorganized onto a single, operating platform is critically needed due to the fact that the current systems, sub-systems and/or applications relied on by National Grid's U.S. gas business are difficult for employees to navigate, are no longer supported by vendors, or are otherwise unsuitable to support gas operations into the future. Implementation of the three major capabilities encompassed within the GBE program on an integrated basis in all three jurisdictions will cost customers less than implementing the same systems one at a time by jurisdiction because it will avoid costs that would arise with work completed on differing timelines, with potentially differing vendors. For these reasons, it is imperative that the Company obtain revenue support for the GBE program in this case to be able to continue to implementation in Massachusetts, which will ensure customers will receive improved safe and reliable gas service with significantly improved customer service.

Q. Are you presenting any exhibits in addition to this joint testimony in support of the Company's request relating to the GBE program?

A. Yes. In addition to this joint testimony, we are sponsoring the following exhibits in support of the Company's request for cost recovery in relation to the GBE program.

Exhibit Designation	Description
Exhibit NG-GBE-1	Joint Testimony of GBE Panel
Exhibit NG-GBE-2	Depiction of Current and Future State Systems in Massachusetts
Exhibit NG-GBE-3	Key Initiatives By GBE Workstream
Exhibit NG-GBE-4	GBE Corporate Governance Structure
Exhibit NG-GBE-5	GBE Roadmap
Exhibit NG-GBE-6	Example of Gas Operations Capabilities with GBE
Exhibit NG-GBE-7	Example of Customer Experience Capabilities with GBE

Q. How is your testimony organized?

A. Section I of this testimony is the Introduction. Section II discusses the operating challenges that are creating the imperative for development and execution of the GBE program. Section III discusses the GBE program governance structure and procurement process to assure program costs are reasonable and prudently incurred. Section IV describes the process changes that will result from program implementation and identifies the efficiency improvements and customer benefits that will result from program implementation. Section V reviews the Company's proposal for cost recovery to support program implementation.

II. Imperative for Development of the GBE Program

Q. What is the genesis of the GBE program?

A. In the course of day-to-day operations, employees are facing substantial challenges in scheduling and completing work, communicating both externally

and internally regarding customer service needs, capturing and accessing data necessary for the various business processes, and discerning whether, when and how work is getting done. These challenges arise from the fact that employees must navigate numerous, disparate, inefficient and/or manual systems and processes within the gas distribution business in order to perform critical functions for gas operations and provide quality field service to gas customers. In Massachusetts, this state of affairs made it extremely difficult to implement the Department's mandate to institute a four-hour appointment window instead of the six-hour window for service appointments, for example.

All work streams that would normally be associated with an overarching Work Management, Asset Management and Customer Enablement system are performed by employees relying on a less-than-adequate work and asset management system resting on a combination of software applications, databases, and spreadsheets that are used in parallel with or to facilitate existing manual processes to manage the business. National Grid has used these systems for as long as possible to support business operations. However, at this point, the need for a broad-based software solution providing a stronger operating platform is an imperative because there is risk involved in continuing to rely on the current

processes and sub-systems to support safe and reliable operations while meeting customer expectations.

Q. What is creating the imperative for the Customer Enablement component of the GBE program?

As National Grid is confronting the challenge of establishing a new platform for the work management and asset management systems, the landscape for serving utility customers is undergoing unprecedented change in relation to digital technology and escalating customer expectations. The electric and gas distribution industries are experiencing pressure to meet customer expectations that are being formed by customer experiences with other goods and services vendors increasingly supported by digital technology allowing for quick and easy customer-service interfaces, among other advancements.

For example, many of the Company's customers transact business with other vendors that offer customer-service features such as the ability for customers to choose their communication preference with the vendor; (e.g. to communicate with the vendor on service visits through text messages; and to make use of shorter appointment windows). Many service providers now have easy-to-use web portals and customer apps that offer greater scheduling and rescheduling options. Customers frequently have the option with other vendors to make and/or

reschedule service appointments by taking a few moments to log in online through a mobile device and choose another time for the appointment, without ever having to interact on a personal basis with the vendor's customer-service department.

For gas utility services, the same customer would have no alternative for scheduling or rescheduling an appointment than to place a telephone call to customer service and get back in the queue for the next available appointment with no direct line of sight into the options available as only the customer service representatives have access to the appointment schedule. Customers expect to have the same level of ease and convenience with their gas or electric utility as they do with other household vendors. As a result, it is necessary for the Company to accomplish a step-change in the delivery of customer service that can only be achieved with a technological solution that constitutes a fundamental upgrade from the systems relied on to provide service today.

Collectively, these two dynamics – the resolution of operating risk in relation to the sub-systems relied on to perform work functions and the need for improvement in customer-contact alternatives -- create an indisputable imperative for formation of the GBE program. It is clear that National Grid must make a

step-change to create the platform that will enable more effective front-line field operations and customer service. It is also clear that the intensifying pressure to create a digital platform for customer's interacting with the Company needs to be addressed through the development of digital solutions. Therefore, National Grid has launched the GBE program to meet the imperative and will accomplish a major step-change in the operating platform for the U.S. gas business with program completion.

Q. What are the specific factors creating operating risk in relation to front-line business processes?

A. Fundamentally, National Grid's U.S. gas business is in an unsustainable position in terms of meeting operating and customer-service requirements with current, legacy systems within the rapidly changing external environment. Approximately 94 percent of the "front office" systems relied on by the U.S. gas distribution business will reach the end of useful life within two years, making it increasingly difficult to maintain the reliability of critical, core operating systems.

In particular, the ability to make modifications to the software to adapt to new needs or regulations is severely limited, if possible at all. Many of these systems are no longer supported by the vendor and the software is written in older code that is not flexible or modifiable and therefore cannot be used to address changing

regulatory and customer expectations. The age of the existing applications drives risk of system outage as reliability of the old systems dwindle. The cost to update/upgrade the existing systems individually would be higher and would not result in the benefits envisioned with GBE program, which will replace the existing environment with a holistic solution on a new modern platform to address risk, reliability efficiency and customer interaction.

Q. Are there any other considerations that impact the reliability of these systems in supporting operating activities?

A. Yes. Over time, as the gas distribution business has evolved, work processes have moved forward through reliance on successive stages of "work arounds," which have made those work processes more and more complex. Few of the legacy company practices and processes are standardized, particularly in relation to data storage, asset records and mapping systems. The sub-systems/applications are databases, applications and/or manual processes tracked through spreadsheets with severely limited connectivity to each other. This complex patchwork of applications makes it very difficult for various operating units to work together or to have visibility of the work performed in the field or at a customer's home. Many of the processes are highly dependent on manual processes to track whether procedures are followed and work is completed in compliance with applicable

requirements. In addition, it is becoming increasingly difficult and costly to maintain these disparate systems and to engage employees in the work necessary to navigate successfully the challenges imposed by this situation.

By replacing the existing sub-systems, applications and databases with three core systems, the entire U.S. gas business can be reorganized onto a single operating platform, within three overarching systems to perform day-to-day work and customer interactions with greater effectiveness than is possible today.

Q. Will the implementation of GBE help to improve the Company's ability to achieve compliance with regulatory requirements and expectations?

A. Gas safety for customers and employees is of paramount importance. Aging, disparate and duplicative systems impede the Company's ability to demonstrate compliance, manage performance and lack the flexibility to address a changing regulatory and customer environment. Gas-safety compliance challenges arise not only as a result of system and data gaps, but also due to the difficulty of providing effective technical training to employees on complicated work methods and procedures that are necessitated by the less-than-adequate work processes associated with legacy systems. Implementation of the GBE program will assist in addressing these considerations.

In addition, although regulatory requirements and expectations have been rapidly increasing since the 2010 San Bruno incident in the San Francisco area and events in Allentown, PA and East Harlem, NY, the current systems cannot be modified to meet increasing requirements, thereby creating the need for manual work processes to achieve compliance. GBE will provide consistent applications throughout the business and provide the necessary tools to accurately track, store and report on gas operations data. These items include data compilation and retention in relation to leak and corrosion repair work, Distribution Integrity Management Plan requirements and assistance in satisfying the 10 key elements of AP RPI 1173. Historic and future compliance issues are arising due to the existence of dis-jointed, disparate, outdated systems that make it difficult to keep up with and demonstrate current compliance obligations.

Q. Does the customer experience provided today through current systems meet the expectations of customers?

A. No. As mentioned above, without the replacement of the current systems, National Grid cannot adapt to the way customers expect to conduct business with a gas utility. Customers today have different expectations of customer service. In particular, the expectation of fast, easy, mobile applications and solutions is shared by all customers, particularly as relatively younger customers join the

customer base. Interactions with other industries are setting customer expectations and preferences and gas and electric utilities cannot meet these expectations without new systems. Customers expect to have access to mobile applications that can be used to set-up or reschedule service appointments, find out status of their request or find out information about outages. Having mobile access and interactions with the utility that include text messages and information regarding service technicians that will be arriving to a customer's premise not only represents helpful information for customers, but reduces unable to complete work due to customer availability and also constitutes a level of service and security that is unattainable in the absence of these technological solutions.

Q. What are some other examples of how customer expectations changing?

A. Today, customers of a gas or electric utility can use mobile applications to request a car for pick-up at a designated location and are almost instantly provided with the name, type of car and picture of the person performing the pick-up, with payment made simultaneously through the same application. Customers are also able to easily use mobile applications or websites to order groceries or other goods and have those goods delivered right to front door within one day, or even sometimes the same day. When customers experience such a high level of service

and ease of service in one area of their commercial transactions, they begin to expect that level of ease with other services they use.

For example, applications that allow customers to easily access information regarding the deployment of resources teach customers to have the expectation that all deployed resources can easily be tracked electronically. However, if a customer called National Grid today to ask why a National Grid truck was working at the end of the customer's street, it would not be a simple task to get that answer. The customer would need to call Customer Service and speak with a representative who would need to research the situation because the representative would not have visibility to the reason that work is being performed at the end of the customer's street. By the time an answer is provided to the customer it may be of no use as the truck could already be gone from the area. With a single, streamlined work-management system in place across National Grid's operating jurisdictions, the Customer Service representative and others involved in the work process would have complete visibility into this information and could provide information to customers almost instantaneously.

Q. Are there other examples of how the front-line work processes and customer-service delivery can be improved through the GBE program?

A. There are numerous examples of how the Company's operations would be made more efficient and cost effective and the customer experience improved as a result of GBE program implementation. Implementation of the GBE program and the establishment of an enterprise-wide Work Management, Asset Management and Customer Enablement system will result in the upgrade of gas and customer processes conducted by the Company to perform day-to-day operations. The new systems will provide more complete data capture and enable associated data reporting; eliminate over-reliance on paper records; create greater visibility of work requirements, and improve the effectiveness of field work and customer interactions. To the customer, these changes will translate into the ability for National Grid employees to obtain information in the field regarding the customer's facilities and service requirements on a real-time basis without resorting to paper records; the ability to schedule work at one time that may otherwise have required multiple visits to the customer's premise; the ability to take and store pictures of the customer's facilities to track atmospheric corrosion and other conditions rather than relying on written notes, and the ability to instantly update mapping systems rather than waiting for data entry back at the office.

More formally, the GBE program will design, standardize and implement core systems to support operations and customer-service delivery in Massachusetts, Rhode Island and New York. This includes:

1. Implementation of an enterprise-wide asset and work-management platform for the U.S. gas business;

2. Establishment of a scheduling platform to support optimized scheduling, work bundling, and routing of work;

3. Development of an integrated Geographic Information System ("GIS") with accurate land-based maps and conversion of gas-service records and sketches, available with mobile functionality;

4. Implementation of a field mobility solution with base capabilities that include views of work assignment, electronic work packages, capture of work status and completion data, and capabilities to initiate work, attach pictures, and view legacy maps;

5. Implementation of the Customer Experience solution that will be deployed to the Customer Contact Center to support improved customer interactions with Contact Center Representatives along with a web based self-service customer portal.

6. Establishment of an enterprise-wide program portfolio management platform for program routing and approval, with the ability to forecast cost, integrated with scheduling, and design; and

7. Development of an Asset Investment Planning and Management tool (*i.e.*, software application) to perform asset condition assessment and risk ranking/prioritization of asset replacement.

The integration of these core systems housing records relating to gas distribution and gas transmission assets and various transactional data will support a more simplified approach to asset management and work administration. In addition,

the integrated implementation of the core work, asset and customer enablement systems will make available valuable tools such as a mobility solution for leak investigation and inspection work orders and enhanced employee utilization.

The GBE program will also implement standardized operations processes and training in a number of areas, which have not previously been standardized due to the complexities inherent in relying on multiple supporting systems. Some of the key work-process improvements would include:

1. Improved methods of Employee training on new standardized processes and technology and a modernized approach to field technical training;

2. Establishment of data-management principles and governance processes that would manage the relationships among defined sets of data (on assets, people, work orders, etc.), the movement, cleansing and conversion of data from a source application to a target system, data retention policies (business, regulatory, and legal holds), data archiving policies, data deletion and destruction policies; and digitization of records;

3. Specification of an organizational design including role descriptions, accountabilities, span-of-control analysis, retirement and attrition analysis, role title rationalization, and diagnostic recommendations;

4. Delineation of the standard processes for work performed by internal and contract resources;

5. End-to-end work processes will include the Pipeline Safety Management System API 1173 framework to support compliance driven requirements;

6. Identification of best practices for warehouse and transportation operations to increase material readiness and create inventory certainty; and

7. Standardization and improvement of the processes and related, procedures between supply chain and gas operations functions.

Exhibit NG-GBE-3 identifies key initiatives within the GBE program and the workstreams associated with each initiative.

Q. Please describe how GBE will address the customer experience.

A. Another key element of GBE is that it will provide improvements to customer and employee interaction. A flexible interface will be integrated with the core systems to allow customers, call center and field employees to operate on a common platform and more easily access data. An application portal will be developed and integrated with work management and scheduling solutions that allows customers to interact with the Company by receiving updates based on their preferences for appointments, addressing inquiries for new gas connections and conversions and having access to information about work on their streets or in their neighborhoods.

Similarly, an employee application portal will be developed and further integrated with the work management, scheduling, dispatch and GIS to support one view of relevant information, such as asset and field data including past transactions for call center representatives and field employees to better communicate with customers and meet their needs. This interface also builds the capabilities

necessary to rapidly adapt processes, capture data, and address developing channels for customer engagement in the evolving future energy marketplace.

III. GBE Governance and Procurement

GBE Governance Framework

Q. How is National Grid approaching the management of the GBE program given the broad scope, complexity and cost of the program?

A. Given the broad scope, complexity and cost of the GBE program, National Grid has proceeded with program development using a well-defined management structure with defined leadership roles and accountabilities as depicted in Exhibit NG-GBE-4. In that context, National Grid has made a number of decisions in structuring the GBE governance framework to incorporate lessons learned from the past. For example, the planning assumptions for the GBE program avoid a "Big Bang" approach to implementation and, instead, adopt a phased approach reflecting process, technology and organizational limitations and opportunities.

In addition, National Grid is planning to deploy "off-the-shelf" capabilities to the maximum extent possible to minimize the customization of the system and preserve the flexibility and functionality of the system as designed. In addition, the GBE program has developed a well-defined program roadmap to reduce risk in implementation and to provide clear visibility of critical path dependencies to

assure successful implementation as each phase progress. This roadmap is provided as Exhibit NG-GBE-5. Lastly, National Grid has initiated a rigorous, competitive and analytical process to identify third-party partners to design, plan and execute the GBE program subject to clearly defined contractual parameters and performance requirements.

This GBE Governance Framework and the rigorous procurement process employed to identify third-party partners to assist in developing the GBE program are significant management tools to make sure that program costs are reasonably and prudently incurred in the course of achieving the identified program benefits for customers. In particular, National Grid has limited the risk associated with implementation through a fixed-cost arrangement with the program-delivery vendors and clearly defined requirements and work-scopes within the contracts developed jointly by the National Grid team and vendors during the procurement process.

Q. Please provide an overview of the GBE governance framework, team and delivery partners?

A. There are several components to the GBE governance framework, as shown in Exhibit NG-GBE-4. These components include the following:

The **Steering Group** will have ultimate authority over, and responsibility for, the completion of the GBE program on a reasonable and prudent basis. The Steering Group consists of the U.S. Chief Executive Officer, U.S. Chief Financial Officer, Executive Vice President of Network Operations, Safety and Capital Development, Senior Vice President and U.S. Chief Information Officer, Senior Vice President of Human Resources and Chief Diversity Officer, Global Chief Procurement Officer, Group Director of Business Excellence, and Senior Vice President of Regulatory Affairs. The Steering Group will focus on program delivery and will provide strategic advice and guidance, address resource requirements, maintain prioritization of the work effort among other operational needs, and manage escalated issues (including changes to the portfolio anchors, potential increases in program costs and review of unplanned customizations).

The **Senior Vice President of Gas Business Enablement** reports to National Grid's Executive Vice President of Network Operations, Safety and Capital Development with accountability to the Steering Group for the successful delivery of the GBE program and its anticipated benefits.

The National Grid **GBE Leadership Team** includes the Vice President of Business Process and Requirements, the Vice President of Solution Development and Delivery, the Vice President of Business Design & Readiness and the Head of

the Portfolio Management Office. Each of these business leaders has a defined role in the process, establishing accountability for: (1) defining the standard "to be" business processes, embedding data management and governance and capturing and delivering the business requirements; (2) developing and delivering the information systems solution to meet gas business operating requirements and the ongoing support model; (3) the future gas operating model, developing and implementing a change program to deliver the process, system and cultural changes; (4) developing and deploying a refreshed approach to technical field training; and (5) keeping the GBE program to time and budget goals, and maintaining compliance with program objectives.

The **Design Authority** consists of the Senior Vice President of Gas Process and Engineering along with vice presidents from the gas business, including each jurisdictional group and work functions intrinsically related to, and affected by, the GBE program. This group works with the GBE Leadership Team and ensures that business leaders are informed on progress and key issues, sign-off on business decisions, endorse business requirements, and take responsibility for delivery of business benefits.

Independent, third-party **Delivery Partners** will work with National Grid as the program design and deployment leads to execute work on pre-designated work streams and will assist in building change leadership capability at all levels in the gas business so that employees (who are deeply immersed in the current practices and processes engendered by legacy systems) are prepared to realize the full capabilities and competencies of the GBE program, once implemented. To ensure success of the program for National Grid's customers a value assurance partner has been chosen as an independent quality assurance function, monitoring the performance of the GBE program and its workstreams and reporting to the steering committee progress and recommendations for improvement. **Value Assurance** function will be performed by an independent, third party to ensure not only successful delivery of the program but also achievement of the anticipated benefits.

The GBE Program is subject to an **annual sanctioning process** before the U.S. Sanctioning Committee ("USSC"), and the U.S. Senior Executive Sanctioning Committee ("SESC") through which approval of the annual budgets and any associated modifications will be reviewed and approved.

Q. Please describe what types of changes or outcomes will require approval from the Steering Group or other executive leadership.

A. The GBE Program requires annual review by the USSC, and the SESC, including annual approval of the budget for each fiscal year. In addition to the annual sanctioning process, any changes to the major portfolio anchors of the program, increase in program costs or unplanned worked requires the review and approval of the Steering Group. Lastly, the external Delivery Partners have executed fixed-price contracts for this program with specified program performance parameters. This structure provides for a process that will have less instances of large change in program costs over the course of the implementation and holds the external partners accountable for successful implementation of the portions of the program for which they are responsible.

Q. How will the GBE program team assess the readiness of the business to begin using components of the GBE program, as those components become functional?

A. The GBE Leadership Team will work with the Design Authority that is comprised of the Vice Presidents across the gas business, supporting functions, and jurisdictions to identify, by geography and functional group, readiness of their function to begin use of the GBE components as they become available. This will be accomplished by evaluating jointly developed readiness criteria at identified go/no go checkpoints to ensure that the functional group is prepared to proceed.

In addition, performance will be monitored throughout the "go live" process and beyond to identify any problem areas that need to be addressed. The readiness criteria will include, but are not limited to, system readiness (including functionality and technical infrastructure) determined through user testing, people readiness determined through training delivery and leadership observations, and business readiness determined through review of processes and procedures.

Q. What is the purpose and value of "Change Management" within the GBE program?

A. The best technology available to the Company will not deliver the potential value achievable for customers without the commitment of our employees to leverage the capabilities of the technology to drive performance. As a result, training and other "change management" strategies will be utilized to engage employees in the implementation of the GBE program. GBE's Change Management strategy is designed to build leadership capability, define and reinforce new mindsets and behaviors to create a culture of focus and accountability and to transition the organization to new ways of working and better serving customers aligned with their increasing expectations. Change management will also help to facilitate rapid adoption of new processes and work tools following program implementation.

As part of the change-management process, comprehensive training will be provided to all users of the systems, both field and office workers as well as first line and upper levels of management. Training materials and training exercises will be tailored to the audience, and the training will be delivered using various media such as computer-based instruction, video, classroom, mobile and written help guides.

Although there is cost and time involved in training employees to levels adequate to not only operate, but optimize the functionality of the GBE program components, there is great value that will be produced by this training. National Grid recognizes the significance of this aspect of the GBE program and has created the change management office responsible for stakeholder engagement, training development and deployment prior to implementation of the systems.

GBE Procurement Process for Delivery Partners and Value Assurance

Q. Please describe the scoping and authorization process for the GBE program and associated procurement.

A. In November 2015, the conceptual basis for the GBE program was brought to the Group Executive Committee for review, approval and initial funding. This authorization was necessary to initiate the process to scope the solution and create the overarching strategy for procurement, implementation, and governance. The

Group Executive Committee approved the concept for GBE and created the GBE Steering Group. Funding in the amount of $25 million was authorized to perform an assessment of program alternatives and commence program planning. The GBE Steering Group was charged with reviewing and approving the initial program scope and procurement strategy. Mr. Johnston was appointed Senior Vice President of GBE on January 1, 2016 and formally moved into the position in April 2016.

From there, Mr. Johnston began to build a competent, experienced program team dedicated exclusively to GBE program implementation, with the expectation that independent, third-party service providers would be procured to assist in design, planning and implementation of the GBE program components. Once assembled, the program team worked for five to six months to evaluate each jurisdiction to identify current operating challenges and to begin to develop an effective and efficient end-state vision. Members of the program teams also visited other utility companies to learn about their experiences and gather input on lessons learned. In addition, National Grid conducted a detailed software review process.

The result of this Phase I strategic assessment helped to develop an efficient roadmap, an appropriate project scope and a reliable cost estimate. This

information was the basis of the procurement process to select partners for the second phase of the program, to implement the roadmap.

Q. How does National Grid plan to assure successful program management and a productive partnership with its external consultants?

A. In the first phase of program development, National Grid relied on a "Design Assurance" partnership to obtain independent advice on the quality of the program roadmap by testing whether the roadmap was complete and able to be successfully delivered. In addition the estimates of potential costs and benefits associated with the program were evaluated.

Following a comprehensive procurement process in the second phase of program development, two vendors were selected to assist in moving the program forward. These vendors were PricewaterhouseCoopers ("PWC") (as the overall Delivery Partner) and Accenture (as the SalesForce Integrator). PwC will serve as the lead system integrator for the GBE program, with responsibility for development and deployment of standard processes and solutions for Work Management, Asset Management, GIS implementation and Data Management supporting each of the workstreams, along with overall delivery through the Portfolio Office and Change Management activities. Accenture is responsible for development and deployment of the field mobility and customer contact center solutions along with

development of the end to end customer processes and other elements of the Customer Engagement model. Kotter International, a world-leading change consultancy based in Cambridge, MA, was selected to perform the Strategic Change Management role and PA Consulting was chosen to provide a third-party, independent view of the progress of the program to the Steering Group (Value Assurance).

Q. How will this intensive program-management structure help to control costs and achieve effective and timely implementation?

A. The fundamental purpose of the competitive procurement process is to develop the components of the GBE program using capable and experienced third-party vendors that have the competency to deliver the program on time, on budget, and with the stated capabilities. The Value Assurance function, independent of both the Company and the other third party vendors, will ensure that the program effectively meets its functionality and financial goals throughout the development process, and will have a direct line to program management. A rigorous process was followed to develop detailed Statements of Work for each workstream, as well as to develop Module Plans and an Integrated Program Plan to correlate the work efforts of the two System Integrators.

Thus, the key features of the contractual arrangements that will help to control program costs are the following:

- A carefully delineated Statement of Work by workstream for program completion;
- A complementary cultural fit between National Grid and its selected Delivery Partners;
- An integrated project plan aligned across workstreams and Delivery Partners;
- Alignment of goals and incentives between the National Grid team and its Delivery Partners;
- Negotiated fixed-cost contracts; and
- Utilization of a Value Assurance partner, reporting directly to the Steering Group, for independent oversight and control.

This approach will assure that the costs that are incurred to fully implement the GBR program are reasonable and prudently incurred in achieving the benefits available for customers through program implementation.

IV. Perspective on the Before and After Scenarios

Q. Please describe the planned implementation.

A. National Grid is implementing GBE in phases by breaking down the program by work types and geography, beginning with the Rhode Island jurisdiction, which is highly reliant upon paper-based operations, and where implementation risk can be mitigated given the system's relatively smaller footprint. Initial focus for

implementation will be the replacement of outdated and unsupported core applications and implementation of updated solutions as quickly as possible to help reduce the risk associated with those critical, unsupported applications.

This strategy will create a foundation for building incremental enhanced capabilities supporting safety performance, operations effectiveness, and customer experience. The first release implementation will occur in FY 2018 for National Grid's Rhode Island gas distribution operations, the Narragansett Electric Company. Following the release in Rhode Island, the Company will begin to deliver and implement GBE in other service territories. Exhibit NG-GBE-5 provides the roadmap regarding implementation of the key initiatives encompassed within the GBE program. As shown in that exhibit, implementation for Massachusetts is set to begin in FY 2019.

Q. Please describe some of the specific programs/capabilities that will go in-service for Boston Gas and Colonial Gas.

A. As mentioned above, the first phase of implementation in Massachusetts will occur in FY 2019. This first phase in Massachusetts would involve the implementation of the work-management functionalities supporting the Instrumentation and Regulation and Corrosion functions, as well as processes for field collections and customer meter services activities, basic scheduling,

dispatching, and field data capture. In addition, the asset-management system will be placed in service for the Gas Transmission and Distribution Integrity Management Processes, which will standardize and improve data accuracy and enhance gas system safety and reliability.

The next phase of implementation in FY 2020 for Massachusetts would include systems and capabilities to enhance the customer experience. These capabilities would include field visibility to customer payment history, field acceptance of credit card payments, field printing, call center visibility to collections status, and field visibility to maps. This phase will also involve full deployment of capabilities across Field Mobile applications to support all customer meter services activities, including real-time communications between call center, dispatch, field employees and other customer support groups. Lastly, the standard GIS data model will be fully utilized in Massachusetts at this time.

The next phase to occur in FY 2021 for Massachusetts would include systems and capabilities to enhance gas construction and leak-repair activities. These capabilities would include a standardized unit cost library enabling more accurate cost estimates, contractor mobility, customer appointment booking, mobile time tracking, and field asset correction and geographic location. Once these backbone

systems are delivered in Massachusetts over the three-year period (FY 2019 through FY 2021), the enhanced capabilities will begin functioning during FY 2021 and FY 2022. These enhanced capabilities will include items such as customer self-service, field crew/customer interaction portal, complex design tool for construction, and asset risk visibility.

Q. Please describe how National Grid's gas operations currently function, from an overall perspective.

A. Today, gas operations operate from an inefficient patch-work of legacy systems and manual spreadsheets to perform critical gas operation activities. The current sub-systems and applications operate on older, unsupported operating systems and are accessed in the field from older hardware (i.e. Truck mounted laptops) that are beyond their useful life. These field devices require regular maintenance, causing inefficiency and necessary work arounds while these devices are being serviced. Procuring parts for these devices is becoming increasingly difficult due to the fact that manufacturers no longer support the products.

The disparate systems make it difficult for employees to navigate the systems, and are prone to human error, missing data, delays in information, lack of visibility among functions and lack of ability to adapt to future regulatory expectations. For example, the many systems used today require manual controls, local

tracking, and follow up as part of scheduling required work activity in the field including warning tags. Scheduling, dispatching, and tracking of gas work today requires many manual controls across different systems, making full visibility of work required and how it is performed difficult.

For perspective of the volume of work, National Grid responds to approximately 2,300 service appointments *per day* across its three operating jurisdictions, which creates a significant challenge for National Grid to meet its current operations goals.

Q. How will these circumstances differ once GBE is fully implemented?

A. Once the GBE program is fully implemented, the U.S. gas distribution business will operate from a standard suite of integrated software applications comprised of three core systems utilized by employees to execute critical work activities. These systems will include modern software applications with the ability to configure, integrate and enhance in order to adapt to future operational, regulatory and customer expectations. There will no longer be reliance on manual controls and/or multiple spreadsheets, but rather will allow for full visibility of work required, scheduling and performance across functions. The work force will be trained on the new systems in a uniform way making work consistent across the company, subject to varying regulatory compliance requirements.

All work will be contained in an integrated suite of systems with pre-defined rules that will automatically schedule work in advance of a due date, and there will be central visibility to ensure all mandated activities are completed in a timely fashion. One example would be all field workers having mobile devices that will allow warning tags to be completed electronically and printed in the field, which will enable validation of information as the tag is completed, and will give the Company an electronic copy of the tag. It will also enable follow up work to be automatically scheduled, significantly reducing the reliance on manual processes and controls, also provides the call center visibility to tag information and enables better customer service for customer follow up calls.

National Grid will be able to track and manage crew and individual worker productivity, including the standardization of business processes for enhanced visibility of work and more efficient scheduling. GBE will also include a new GIS to improve the Company's ability to capture, store, access and analyze geographical asset information concerning its gas distribution and transmission network. The GIS will provide a single view of all assets, which will facilitate data-driven investment and maintenance decisions. This will strengthen the Company's ability to operate a safe, reliable gas distribution and transmission system and drive continuous improvement in regulatory compliance and

transparency with more complete data capture and reporting. Exhibit NG-GBE-6 illustrates the gas system capabilities post-GBE implementation.

Q. Please describe what the National Grid customer experience is like prior to GBE implementation?

A. Today, a customer does not have many options in engaging with the Company other than a phone call placed to customer service or limited interaction through the website. For example, to make a service appointment today, a customer must contact the call center and speak to a customer representative to schedule an appointment. In addition, any question about repair work or other service questions would require a phone call to the call center and significant follow up to determine the status of work and/or why work is being performed in a customer's neighborhood.

Q. How will the customer experience differ after GBE program implementation?

A. The GBE program will provide enhanced customer service through improved scheduling and dispatch, with enhanced appointment booking and frequent communications with customers according to their media preferences, as well as the ability to create a 360-degree view of past, scheduled, and potential future work for customers. Following GBE implementation, in addition to contacting the call center, the customer will have the option of using the web to make the

appointment, and will be presented with a screen showing the available appointment windows. The customer will also have the option to receive a call or text when the field worker leaves for the appointment. Finally, if a customer called to find out what work was being done on their street they would be able to receive an accurate answer from the call center in real-time. Exhibit NG-GBE-7 illustrates the customer experience capabilities after GBE program implementation.

V. Proposal for Ratemaking Treatment

Q. What is the anticipated cost of the GBE program on an overall basis?

A. The total cost of the GBE program for National Grid's U.S. gas distribution business is currently estimated at approximately $478.3 million over the period FY 2017 to FY 2023. Of this amount, approximately $315.1 million represents capital costs and $163.2 million represents one-time operating expenses necessary to complete the GBE initiatives. Although delivery of the GBE Program initiatives is expected to occur within the total costs stated herein, it is important to note that program costs may shift between the years as each of the programs completes detailed design. Therefore, an additional $61 million has been budgeted as contingency in the event of unforeseen scope changes, changing

market conditions affecting vendor and procurement costs, and unanticipated program complexity; this contingency has not been reflected in the Company's revenue requirement. However, if any portion of the contingency amount is used the Company will include it for purposes of recovery when the GBE fund amounts are reconciled in the next base rate proceeding.

Q. What is the anticipated cost of the GBE program for the Company?

A. Because the GBE program is a shared investment, only a portion of the total investment would be allocated to Boston Gas and Colonial Gas. Further, since the program will be implemented over a multi-year period, the costs for Boston Gas and Colonial Gas will be incurred at various points in time over the next few years. The allocation would be in the form of rent expense as part of the overall IS service rent expense allocated to Boston Gas and Colonial Gas. The total costs for GBE attributable to Boston Gas and Colonial Gas are $31.8 million in operating expense and $95.3 million in Service Company capital costs allocated to Boston Gas and Colonial Gas as rent expense.[2]

[2] This includes the depreciation of $71.5 million and return of $23.8 million over the full life of the assets (through FY 2033).

Q. Please explain how costs for the GBE program will be allocated to Boston Gas and Colonial Gas.

A. In general, GBE Program costs will be allocated using the customer cost causation allocator under the guidelines of the Service Company Cost Allocation Manual. The majority of the program will be allocated among the gas operating companies, with the exception of two workstreams: (i) Scheduling, Dispatch, and Mobility and (ii) Customer Engagement. These two workstreams will provide benefits to the electric distribution companies and therefore the costs associated with them will be shared with the Company's electric distribution affiliates. The current expectation is that the allocation proportions among the jurisdictions for overall GBE costs will be approximately 24 percent to Massachusetts operating affiliates; seven percent to Rhode Island operating affiliates; and 68 percent to New York affiliates.

Q. How does the Company propose to recover the expenses associated with GBE program implementation?

A. Based on the timing and scope of the GBE initiatives, the Company anticipates that GBE Program investments will increase substantially beginning in the Rate Year over the test year and post-test year costs. As a result, the Company's historical costs are not representative of the actual costs the Company will incur in the Rate Year and beyond.

The Company is seeking to recover the costs of GBE implementation without the creation of a separate cost recovery mechanism. The Company is requesting that the Department allow an annual rent expense in the revenue requirement approved in this proceeding that would recover a portion of the overall anticipated cost, subject to reconciliation in a future rate case. The annual rent expense would be set based on planned GBE investment for those GBE initiatives that will be placed in service during the period FY 2018 through FY 2023, along with a proportionate share of total one-time GBE O&M expenses. Specifically, the Company proposes to include $9.4 million for Boston Gas and $2.7 million for Colonial Gas collected through base distribution rates, annually over a five-year period. These amounts reflect the estimated revenue requirement on planned GBE investment over that period. The calculations are set forth in the Company's Revenue Requirements Exhibit NG-DSD-2-Schedule 33.

This annual rent expense or amortization "proxy" will allow for the funding of the program throughout the implementation period. The Company will defer and reconcile the amounts collected through this amortization "proxy" to actual capital investment and one-time GBE-related O&M expense in a future base-rate proceeding and, at that time, will present verification of the total costs that were incurred by the Service Company and support for the allocation of costs to the

Company. To the extent that all GBE investment and one-time GBE costs have not been incurred prior to the establishment of future base rates, it may be necessary to propose a subsequent annual proxy that would be reconciled as part of a subsequent base rate proceeding.

Q. Why is this type of rate allowance necessary?

A: The Company has carefully, thoughtfully and diligently identified the scope of this operating challenge, the process for developing and implementing the solution, and the plan for effecting change across the organization to make optimal use of the solution. The results of this effort and implementation of the new system will transform the way the Company is able to perform critical functions in gas operations and provide a better customer experience that meets customer expectations of today and in the future. The cost to implement the GBE program is in the interest of customers because they will be the direct beneficiaries of the major operational changes and improvements.

Given the prolonged development and implementation schedule and the magnitude of the costs, the recovery of the annual proxy expense over a multi-year period will provide a more stable rate path for customers and will enable the Company to offset its share of project costs during the implementation phase and in-service dates for the Company. This proposed rate recovery would also help to

avoid frequent rate case filings in the next several years in order to recover the significant dollars being invested on this program. The Company needs to move this initiative forward and bring improved operations and customer service to its customers, but will need revenue support given the magnitude of the incremental cost changes from year to year.

Q. What is the ratemaking treatment that the Company is anticipating will apply in New York and Rhode Island?

A. In New York, the Company is currently in settlement discussions with the NYPSC for the NMPC base-rate proceeding, which encompasses an amount of recovery for the GBE program in upstate New York. The downstate New York companies, KEDNY and KEDLI, may seek recovery of their portion of GBE program costs when the next base-rate proceeding is filed. The Company is requesting recovery of the Rhode Island portion of the GBE program costs in the upcoming base-rate proceeding for the Narragansett Electric Company.

Both Rhode Island and New York have a ratemaking structure that allows National Grid's operating affiliates to recover future costs as part of base-rate proceedings. The Department's ratemaking framework does not readily incorporate recovery of substantial, up-coming costs, and therefore, the need for the annual proxy expense is necessary. Without this rate adjustment, the

Company will need to decide whether to file sequential rate cases to allow for cost recovery, or delay implementation in Massachusetts to align with a future rate case. This would have significant impact to customers as overall cost of design and deployment is likely to increase.

Moreover, it will be very difficult to match up the anticipated annual charges to the ratemaking process so that customers are not paying any more or less than the actual annual expense, which is why the placeholder amount over the five-year period will help get the program completed without the constant need for base rate proceedings or an external tracking mechanism, improving administrative efficiency. While the coordinated enterprise wide approach to the implementation of this program results in many moving pieces, it also achieves a more cost-effective implementation, ultimately benefitting customers.

Q. Does this conclude your testimony?

A. Yes.

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Colonial Gas Company
each d/b/a National Grid
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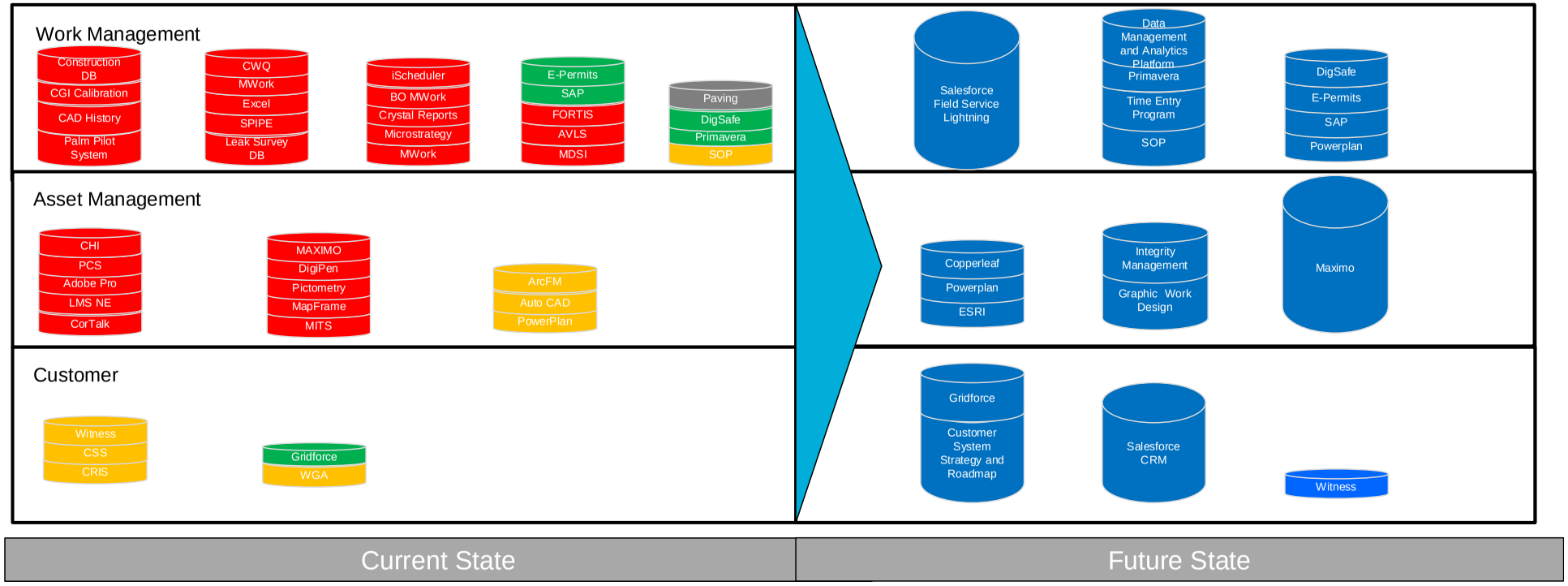
Exhibit NG-GBE-2

Depiction of Current and Future State Systems in Massachusetts

nationalgrid

Current to Future State – Massachusetts [Illustrative]



Current Disposition Risk (Technology/Business)

Unknown

Acceptable → Unacceptable

Future State

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Exhibit NG-GBE-3

Key Initiatives By GBE Workstream

Key Initiatives

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Workstreams	Initiatives					
GBE Portfolio Office						
Change Management	Program Level People Strategy	Stakeholder Management & Engagement	Enablement	Business Readiness & Sustainment	Workforce Strategy / Labor Strategy	
Change Leadership	Organizational Change Readiness	Volunteer Network	Organizational Alignment			
Operating Model	Value Realization	Operations Performance Improvement	Organizational Structure & Design	Governance		
Asset Management	Integrity Management – Corrosion and I&R	Integrity Management – TIMP and DIMP	Asset Investment Planning and Management (AIPM) – Enhancements and Integrations	Advanced Analytics – Platform and Use Cases		
Customer Engagement	Structured Experiences	Contact Center Interaction	Field Interaction	Customer Interaction	Large Commercial & Industrial; Landlord Interaction	Supporting Through Data
GIS	GIS Consolidation	GIS Data Remediation	Landbase Conflation	GIS/EAM Integration	Graphical Work Design (GWD)	Complex Design (CAD) & Estimating (ESW)
Work Management Field Enablement	Business Architecture Design	Corrosion and I&R	Customer, Collections, Resource Mgmt	CU Governance and Library	PowerPlan Integration	
	Construction Work, Leak Inspection and Leak Repair	Projects and Program Management	Work Forecasting & Planning Solution	WMFE Optimization		
Supply Chain	Material Traceability	SC Master Data Improvements	Fulfillment Model / Inventory Optimization	Integrated Supply & Demand Planning / Integrated Business Planning	Warehouse & Network Optimization	
Field Technical Training	Employee Competence	Standard Operating Procedures	Technology			
Data Management	Data Governance	Data Profiling & Cleansing	Data Quality Dashboards & DQI Metrics	Integration & Conversion	Advanced Analytics	
ISE	Integration	Technology Initiatives	Enabling Capabilities			
Value Assurance						

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Exhibit NG-GBE-4

GBE Corporate Governance Structure

GBE governance framework, team and delivery partners:

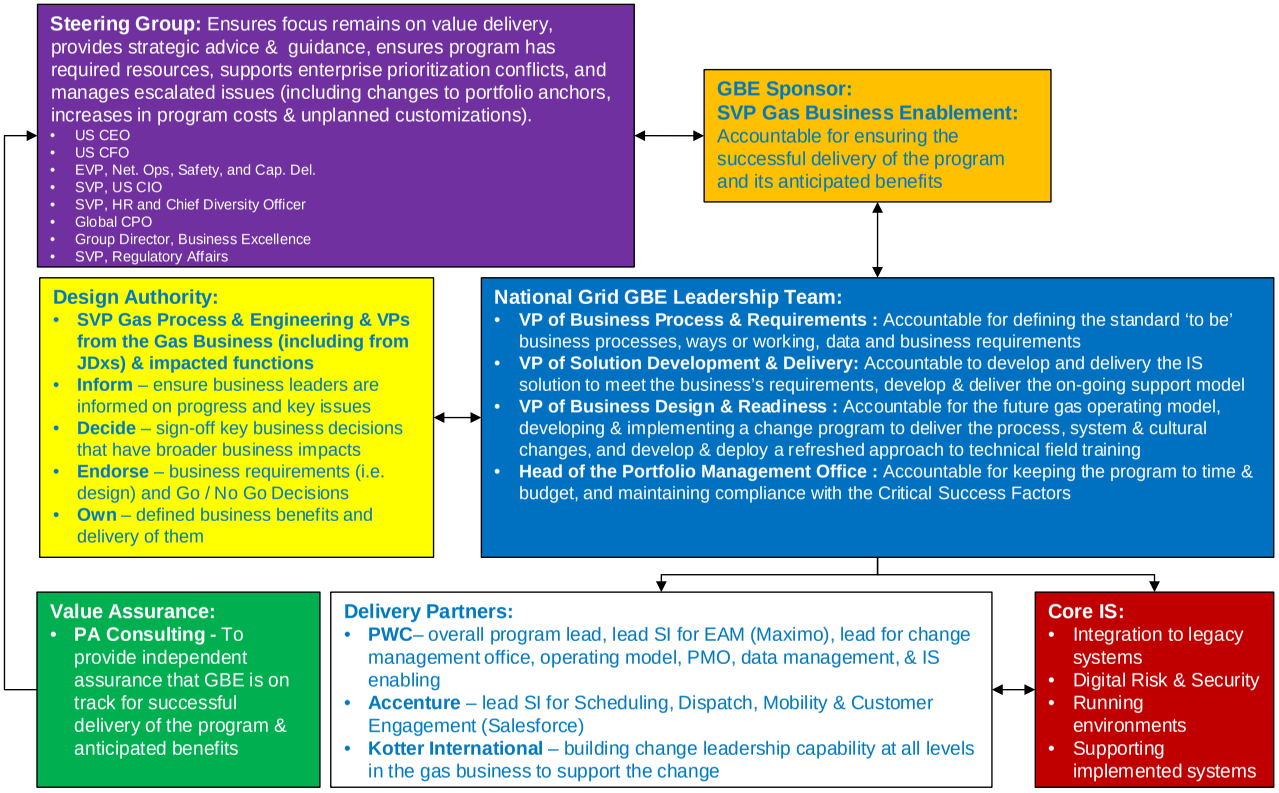

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Exhibit NG-GBE-5

GBE Roadmap

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High-Level GBE Program Roadmap

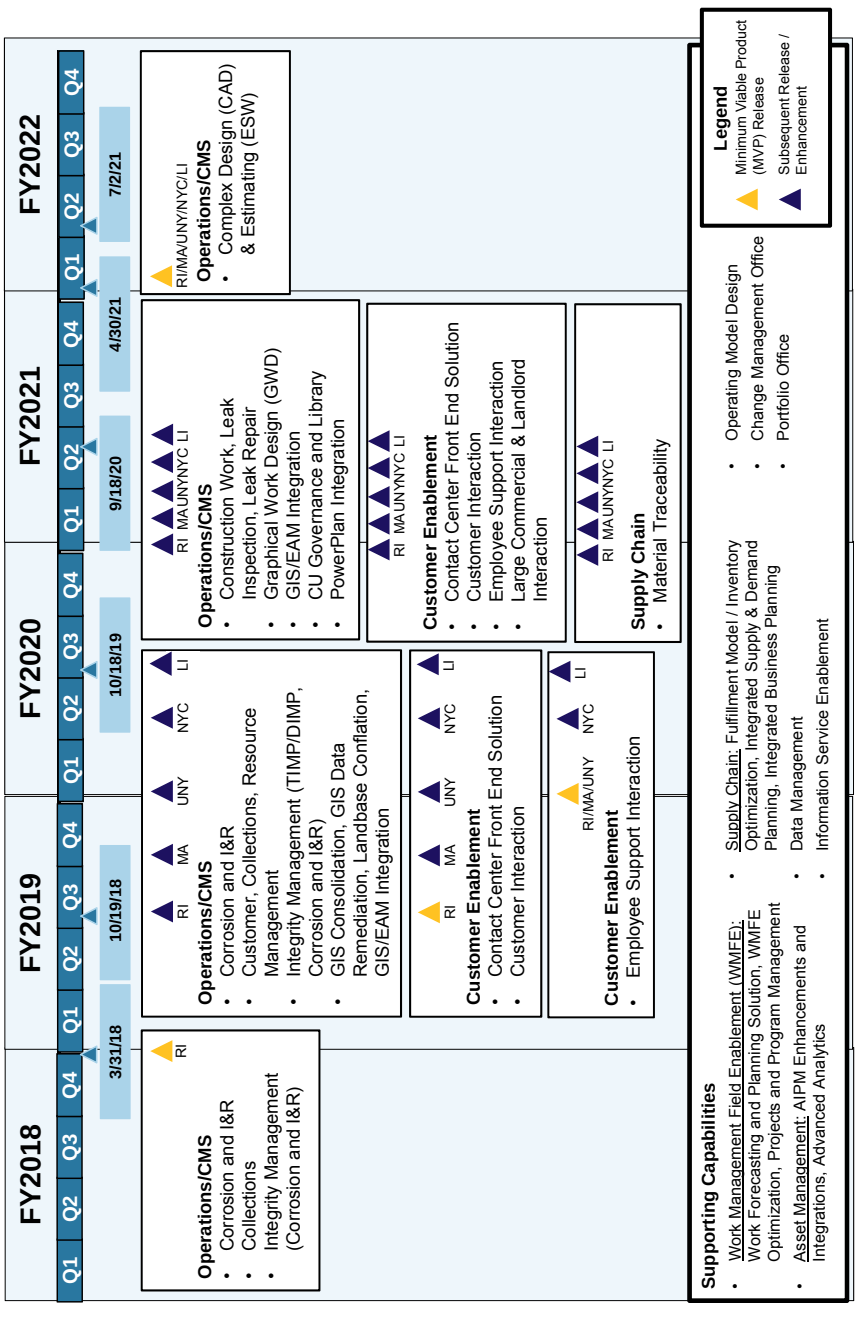

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Exhibit NG-GBE-6

Example of Gas Operations Capabilities with GBE

Employee Capability Aspirations

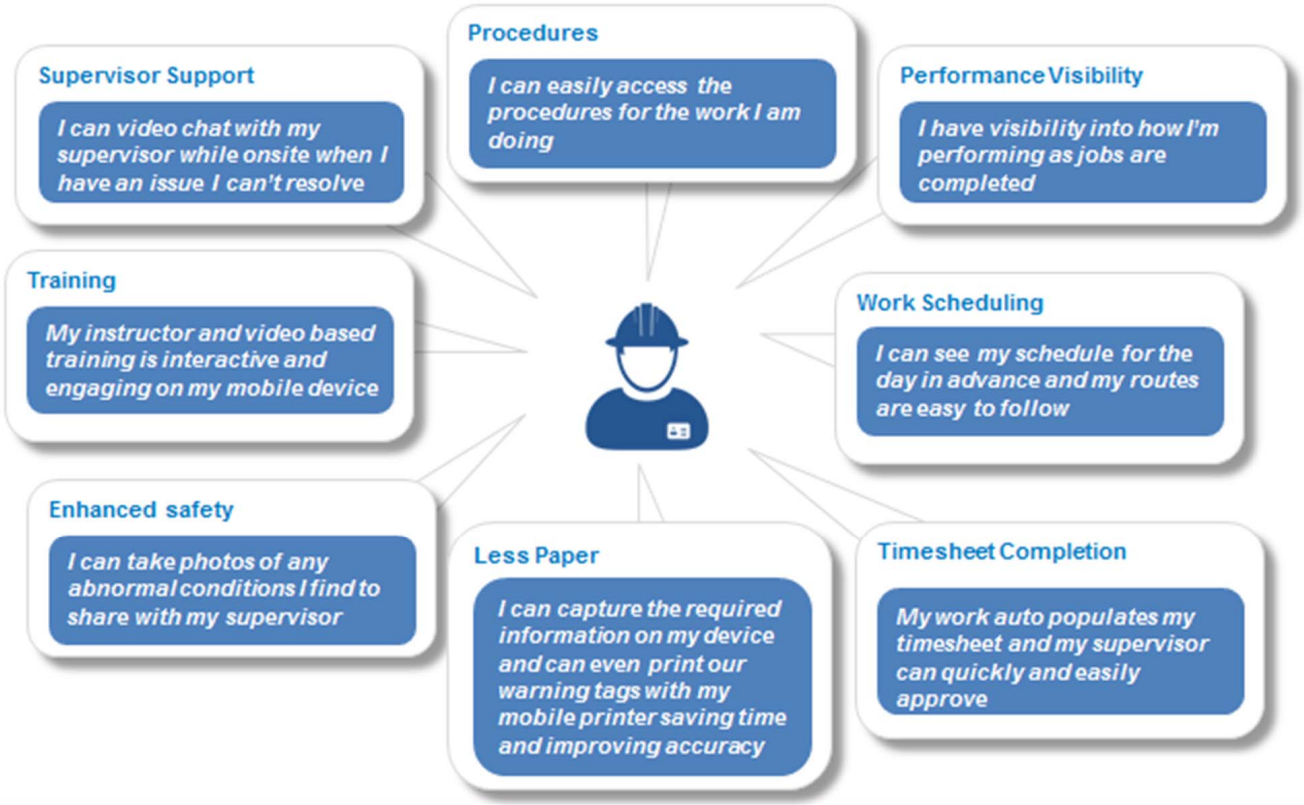

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Exhibit NG-GBE-7

Example of Customer Experience Capabilities with GBE

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Customers Capability Aspirations

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PRE-FILED DIRECT TESTIMONY

OF

DANIEL S. DANE

I. Introduction

Q. Please state your name and business address.

A. My name is Daniel S. Dane. My business address is 293 Boston Post Road West, Suite 500, Marlborough, Massachusetts 01752.

Q. By whom are you employed and in what position?

A. I am a Vice President with Concentric Energy Advisors, Inc. ("Concentric"), and the Financial and Operations Principal of CE Capital, Inc., a FINRA-member subsidiary of Concentric. My curriculum vitae and testimony listing are included as Attachment 1 to my pre-filed testimony.

Q. Please describe your professional background, education and professional licenses.

A. Concentric provides financial and economic advisory services to many and various energy and utility clients across North America. Our regulatory, economic, and market analysis services include utility ratemaking and regulatory advisory services; energy market assessments; market entry and exit analysis; corporate and business unit strategy development; demand forecasting; resource planning; and energy contract negotiations. As a Vice President at Concentric, my responsibilities include assisting clients in identifying and addressing business issues. My primary areas of focus have been regulatory, financial and accounting related issues.

I have an MBA from Boston College in Chestnut Hill, Massachusetts, and a BA in Economics from Colgate University in Hamilton, New York. I am a certified public

removed through a normalizing adjustment totaling $6,463,657 for Boston Gas and $1,893,435 for Colonial Gas.

Q. What was the normalizing adjustment to Test Year O&M expenses to remove those expenses associated with the Gas Business Enablement Program?

A. That adjustment was made by the Companies to remove O&M expenses incurred during the Test Year associated with the GBE Program, as the Companies are seeking to recover those costs through a known and measurable adjustment, as discussed in Section VIII. That program is described more fully in the testimony of the GBE Panel. The total normalizing adjustment was a reduction in O&M expenses of $1,204,449 for Boston Gas and $269,437 for Colonial Gas.

Q. What was the normalizing adjustment to remove all expenses related to the write off of certain capital work orders that had been charged to plant in prior years?

A. The Companies made a normalizing adjustment to Test Year O&M expenses to remove pre-Test Year expenses related to a March 2016 adjustment booked to the Companies' financial statements in which the Companies wrote off certain capital work orders that had been charged to plant in years prior to the Test Year but that the Companies determined should have been charged to expense. Since the entire write off was booked in 2016 but reflected amounts that the Companies should have expensed in prior years, the pre-Test Year expenses (totaling $6,074,629 for Boston Gas and $547,582 for Colonial Gas) were removed through this normalizing adjustment.

Q. Did the normalizing adjustments that affected multiple O&M expenses, discussed earlier in your testimony, affect any of the Other O&M accounts?

A. Yes. For instance, the normalizing adjustments to remove expenses related to the cancelled systems conversion project and to remove those expenses associated with the GBE Program affected multiple of those accounts. In addition, there was an adjustment made to Other O&M to reflect local production and storage costs and gas acquisition costs. Furthermore, there were discrete normalizing and known and measurable adjustments made to certain of the Other O&M accounts, as discussed below.

Q. What was the normalizing adjustment to reflect local production and storage costs and gas acquisition costs in O&M?

A. That adjustment to O&M expenses reflects offsetting entries that correspond to the transfer to revenues of credits made to O&M expenses related to production and storage costs and gas acquisition costs. That transfer is discussed in the testimony of the Pricing Panel. The total normalizing adjustments were $12,306,576 for Boston Gas and $6,768,277 for Colonial Gas.

Q. What normalizing adjustment was made to consultants?

A. Consultants expense was adjusted to reclassify consultant expenses that were charged to other expense accounts during the Test Year, namely insurance premium and property tax accounts.

Q. What normalizing adjustment was made to donations?

A. A minor amount of donations (*i.e.*, approximately $76,000 for Boston Gas and approximately $18,000 for Colonial Gas) were recorded to O&M expense accounts during the Test Year. The entirety of those amounts was removed from the revenue requirement via a normalizing adjustment.

Q. What normalizing adjustment was made to employee expenses?

A. In addition to a normalizing adjustment that was made to employee expenses related to the cancelled systems conversion project (described above), the Companies also made a normalizing adjustment to remove costs from the revenue requirement related to senior executive employee expenses.

Q. What adjustment was made related to other expenses?

A. In addition to the normalizing adjustments described above that were made to other expenses related to the cancelled systems conversion project, the removal of GBE O&M costs, and the work order write off assessment, there were also costs reclassified from labor to other O&M related to the meter abandonment credits (also described above) and costs reclassified from other O&M to insurance related to insurance premiums. In addition, the Companies removed approximately $100,000 of penalty and marketing/advertising expenses that were booked to both Boston Gas's and Colonial Gas's O&M accounts during the Test Year.

relative number of post-Test Year hires at each company. The total costs included in the revenue requirement for this initiative are $700,267 for Boston Gas and $36,241 for Colonial Gas. See Exhibit NG-DSD-2, Schedule 34.

Q. What is the proposed rate recovery for the new operator qualification training and testing process?

A. The Companies propose to recover the cost of this new process, which is approximately $314,000 in total (approximately $211,000 for Boston Gas and $103,000 for Colonial Gas), as shown in Exhibit NG-DSD-2, Schedule 36.

VIII. Gas Business Enablement

Q. Please describe the known and measurable adjustment associated with the Companies' GBE Program.

A. The Companies' proposed known and measurable adjustment to the Test Year cost of service represents the sum of the return of and on capital investments in the GBE Program, as well as GBE O&M expenses, over the period October 2018 through September 2023, amortized over a five-year period. For Boston Gas, the known and measurable adjustment is $9,377,319, and for Colonial Gas the amount is $2,687,246. Those calculations and the supporting data are provided in Exhibit NG-DSD-2, Schedule 33. The Companies' GBE Program is discussed more fully in the testimony of the GBE Panel.

Boston Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		Test Year Ended December 31, 2016 (Per Books)	Normalizing Adjustments to Test Year	Test Year Ended December 31, 2016 (as Adjusted)
		Gas	Gas	Gas
		(a)	(b)	(c)
	Provider Company:			
1	Boston Gas Company	$0	$0	$0
2	National Grid USA Service Company	$0	$0	$0
3	All Other Companies	$0	$0	$0
4	Total	$0	$0	$0
5				
6				
7	Operation:			
8	Production Expenses	$0	$0	$0
9	Power Production Expenses	$0	$0	$0
10	Natural Gas Storage, Terminaling	$0	$0	$0
11	and Processing Exp.			
12	Transmission Expenses	$0	$0	$0
13	Regional Market Expenses	$0	$0	$0
14	Distribution Expenses	$0	$0	$0
15	Customer Accounts Expenses	$0	$0	$0
16	Customer Service and	$0	$0	$0
17	Informational Expenses			
18	Sales Expenses	$0	$0	$0
19	Administrative & General Expenses	$0	$0	$0
20	Sub Total	$0	$0	$0
21				
22	Maintenance:			
23	Transmission Expenses	$0	$0	$0
24	Distribution Expenses	$0	$0	$0
25	Administrative & General Expenses	$0	$0	$0
26	Sub Total	$0	$0	$0
27				
28	TOTAL	$0	$0	$0
		$0	$0	$0

Boston Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		Test Year Ended December 31, 2016 (as Adjusted)	Known & Measurable Adjustments	Rate Year Ending September 30, 2019
		Gas	Gas	Gas
		(a)	(b)	(c)
	Provider Company:			
1	Boston Gas Company	$0	$0	$0
2	National Grid USA Service Company	$0	$9,377,319	$9,377,319
3	All Other Companies	$0	$0	$0
4	Total	$0	$9,377,319	$9,377,319
5				
6				
7	Operation:			
8	Production Expenses	$0	$0	$0
9	Power Production Expenses	$0	$0	$0
10	Natural Gas Storage, Terminaling	$0	$0	$0
11	and Processing Exp.			
12	Transmission Expenses	$0	$0	$0
13	Regional Market Expenses	$0	$0	$0
14	Distribution Expenses	$0	$0	$0
15	Customer Accounts Expenses	$0	$0	$0
16	Customer Service and	$0	$0	$0
17	Informational Expenses			
18	Sales Expenses	$0	$0	$0
19	Administrative & General Expenses	$0	$9,377,319	$9,377,319
20	Sub Total	$0	$9,377,319	$9,377,319
21				
22	Maintenance:			
23	Transmission Expenses	$0	$0	$0
24	Distribution Expenses	$0	$0	$0
25	Administrative & General Expenses	$0	$0	$0
26	Sub Total	$0	$0	$0
27				
28	TOTAL	$0	$9,377,319	$9,377,319
		$0	$0	$0

Line Notes

2(b) Page 3, Line 2

Boston Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

			Provider Company	Total
	Explanation of Adjustments:			
1	Page 1	Known and Measurable		
2		Gas Business Enablement	National Grid USA Service Company	$9,377,319
3				$0
4				$0
5				$0
6				$0
7				$0
8				$0
9				$0
10				$9,377,319

Line Notes

(2) Page 4, Line 13 (d)

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Boston Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
		HTY	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	Boston Gas Total	
1	Return on investment	$0	$2,998	$813,649	$2,805,210	$2,954,479	$2,873,219	$2,352,572	$1,936,411	$1,582,397	$1,248,417	$914,455	$580,540	$255,261	$91,261	$17,904	$17	$0	$ 18,428,792	
2	Depreciation	$0	$3,728	$987,831	$3,925,775	$4,783,518	$5,529,830	$5,532,294	$5,532,294	$5,532,294	$5,532,294	$5,532,294	$5,528,566	$4,544,463	$1,606,519	$748,776	$2,464	$0	$ 55,322,940	
3	Operating expense	$4,904,028	$2,448,590	$9,757,689	$5,327,069	$2,263,200	($13,307)	$137,986	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$ 24,825,256	**44.87%**
4																				
5	Total Revenue Requirement	$4,904,028	$2,455,316	$11,559,169	$12,058,055	$10,001,198	$8,389,742	$8,022,853	$7,468,705	$7,114,691	$6,780,711	$6,446,749	$6,109,106	$4,799,724	$1,697,780	$766,680	$2,481	$0	$98,576,988	
6																				
7																				
8																				
9																				
10																				
11					Boston															
12		5 years		$46,886,594																
13		Annual recovery			**$9,377,319**															
14																				
15																				
16																				
17																				
18																				
19																				

Line Notes

1	Pages 5 through 8, Column (a)	17	Pages 5 & 6, Column (e), Lines 7 through 42
2	Pages 5 through 8, Column (b)	18	Line 17 divided by 3
3	Forecasted project spend	20	Pages 5 & 6, Column (e), Lines 7 through 30
14	Pages 5 & 6, Column (e), Lines 7 through 66	21	Line 20 divided by 2
15	Line 14 divided by 5		

Column Note

(s) Line 3(r) divided by Line 2(r)

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Boston Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Boston Gas Company

		(a)	(b)	(c)	(e)
		TOTAL GBE			
	Date	Boston Return	Boston Depr	Boston Opex	Totals
1	11/01/2017	$676	$746	$335	$1,757
2	12/01/2017	$592	$746	$335	$1,673
3	01/01/2018	$584	$746	$335	$1,665
4	02/01/2018	$576	$746	$335	$1,657
5	03/01/2018	$568	$746	$335	$1,649
6	04/01/2018	$560	$746	$335	$1,641
7	05/01/2018	$552	$746	$335	$1,633
8	06/01/2018	$544	$746	$335	$1,625
9	07/01/2018	$536	$746	$335	$1,617
10	08/01/2018	$528	$746	$335	$1,609
11	09/01/2018	$520	$746	$335	$1,601
12	10/01/2018	$16,634	$18,517	$8,309	$43,461
13	11/01/2018	$14,624	$18,517	$8,309	$41,451
14	12/01/2018	$14,425	$18,517	$8,309	$41,252
15	01/01/2019	$277,985	$309,268	$138,779	$726,032
16	02/01/2019	$245,026	$309,268	$138,779	$693,074
17	03/01/2019	$241,711	$309,268	$138,779	$689,759
18	04/01/2019	$238,396	$309,268	$138,779	$686,444
19	05/01/2019	$252,775	$328,773	$147,532	$729,080
20	06/01/2019	$247,263	$328,773	$147,532	$723,567
21	07/01/2019	$243,738	$328,773	$147,532	$720,043
22	08/01/2019	$240,214	$328,773	$147,532	$716,519
23	09/01/2019	$236,690	$328,773	$147,532	$712,995
24	10/01/2019	$233,166	$328,773	$147,532	$709,471
25	11/01/2019	$229,642	$328,773	$147,532	$705,947
26	12/01/2019	$226,118	$328,773	$147,532	$702,423
27	01/01/2020	$222,594	$328,773	$147,532	$698,899
28	02/01/2020	$219,069	$328,773	$147,532	$695,374
29	03/01/2020	$215,545	$328,773	$147,532	$691,850
30	04/01/2020	$213,861	$330,802	$148,442	$693,105
31	05/01/2020	$210,109	$330,802	$148,442	$689,353
32	06/01/2020	$280,396	$412,191	$184,964	$877,552
33	07/01/2020	$267,680	$412,191	$184,964	$864,835
34	08/01/2020	$263,262	$412,191	$184,964	$860,417
35	09/01/2020	$258,843	$412,191	$184,964	$855,999
36	10/01/2020	$254,425	$412,191	$184,964	$851,580
37	11/01/2020	$250,009	$412,191	$184,964	$847,164
38	12/01/2020	$245,595	$412,191	$184,964	$842,750
39	01/01/2021	$241,181	$412,191	$184,964	$838,336
40	02/01/2021	$236,766	$412,191	$184,964	$833,922
41	03/01/2021	$232,352	$412,191	$184,964	$829,508
42	04/01/2021	$269,496	$460,203	$206,509	$936,208
43	05/01/2021	$259,920	$460,203	$206,509	$926,632
44	06/01/2021	$255,015	$460,203	$206,509	$921,727
45	07/01/2021	$250,785	$461,024	$206,877	$918,687
46	08/01/2021	$245,796	$461,024	$206,877	$913,698
47	09/01/2021	$240,883	$461,024	$206,877	$908,785
48	10/01/2021	$236,020	$461,024	$206,877	$903,922
49	11/01/2021	$231,208	$461,024	$206,877	$899,109
50	12/01/2021	$226,392	$461,024	$206,877	$894,294
51	01/01/2022	$222,400	$461,024	$206,877	$890,302
52	02/01/2022	$219,234	$461,024	$206,877	$887,136
53	03/01/2022	$216,069	$461,024	$206,877	$883,970

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Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Boston Gas Company

		(a)	(b)	(c)	(e)
		TOTAL GBE			
	Date	Boston Return	Boston Depr	Boston Opex	Totals
54	4/1/2022	$212,903	$461,024	$206,877	$880,804
55	5/1/2022	$209,792	$461,024	$206,877	$877,694
56	6/1/2022	$206,737	$461,024	$206,877	$874,638
57	7/1/2022	$203,681	$461,024	$206,877	$871,583
58	8/1/2022	$200,626	$461,024	$206,877	$868,528
59	9/1/2022	$197,571	$461,024	$206,877	$865,472
60	10/1/2022	$194,515	$461,024	$206,877	$862,417
61	11/1/2022	$191,460	$461,024	$206,877	$859,362
62	12/1/2022	$188,405	$461,024	$206,877	$856,306
63	1/1/2023	$185,350	$461,024	$206,877	$853,251
64	2/1/2023	$182,294	$461,024	$206,877	$850,196
65	3/1/2023	$179,239	$461,024	$206,877	$847,141
66	4/1/2023	$176,189	$461,024	$206,877	$844,091
67	5/1/2023	$173,145	$461,024	$206,877	$841,046
68	6/1/2023	$170,331	$461,024	$206,877	$838,232
69	7/1/2023	$167,748	$461,024	$206,877	$835,649
70	8/1/2023	$165,165	$461,024	$206,877	$833,067
71	9/1/2023	$162,582	$461,024	$206,877	$830,484
72	10/1/2023	$159,999	$461,024	$206,877	$827,901
73	11/1/2023	$157,416	$461,024	$206,877	$825,318
74	12/1/2023	$154,834	$461,024	$206,877	$822,735
75	1/1/2024	$152,251	$461,024	$206,877	$820,152
76	2/1/2024	$149,668	$461,024	$206,877	$817,569
77	3/1/2024	$147,084	$461,024	$206,877	$814,986
78	4/1/2024	$144,631	$461,024	$206,877	$812,533
79	5/1/2024	$142,308	$461,024	$206,877	$810,209
80	6/1/2024	$139,984	$461,024	$206,877	$807,886
81	7/1/2024	$137,663	$461,024	$206,877	$805,564
82	8/1/2024	$135,344	$461,024	$206,877	$803,245
83	9/1/2024	$133,024	$461,024	$206,877	$800,926
84	10/1/2024	$130,705	$461,024	$206,877	$798,607
85	11/1/2024	$128,386	$461,024	$206,877	$796,288
86	12/1/2024	$126,067	$461,024	$206,877	$793,969
87	1/1/2025	$123,748	$461,024	$206,877	$791,649
88	2/1/2025	$121,429	$461,024	$206,877	$789,330
89	3/1/2025	$119,109	$461,024	$206,877	$787,011
90	4/1/2025	$116,790	$461,024	$206,877	$784,692
91	5/1/2025	$114,471	$461,024	$206,877	$782,373
92	6/1/2025	$112,152	$461,024	$206,877	$780,053
93	7/1/2025	$109,833	$461,024	$206,877	$777,734
94	8/1/2025	$107,513	$461,024	$206,877	$775,415
95	9/1/2025	$105,194	$461,024	$206,877	$773,096
96	10/1/2025	$102,875	$461,024	$206,877	$770,777
97	11/1/2025	$100,556	$461,024	$206,877	$768,458
98	12/1/2025	$98,237	$461,024	$206,877	$766,138
99	1/1/2026	$95,918	$461,024	$206,877	$763,819
100	2/1/2026	$93,598	$461,024	$206,877	$761,500
101	3/1/2026	$91,279	$461,024	$206,877	$759,181
102	4/1/2026	$88,960	$461,024	$206,877	$756,862
103	5/1/2026	$86,641	$461,024	$206,877	$754,543
104	6/1/2026	$84,322	$461,024	$206,877	$752,223
105	7/1/2026	$82,003	$461,024	$206,877	$749,904
106	8/1/2026	$79,683	$461,024	$206,877	$747,585
107	9/1/2026	$77,364	$461,024	$206,877	$745,266

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Service Company Rent Expense and Operating Expense
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		(a)	(b)	(c)	(e)
		TOTAL GBE			
	Date	Boston Return	Boston Depr	Boston Opex	Totals
108	10/1/2026	$75,045	$461,024	$206,877	$742,947
109	11/1/2026	$72,726	$461,024	$206,877	$740,627
110	12/1/2026	$70,407	$461,024	$206,877	$738,308
111	1/1/2027	$68,087	$461,024	$206,877	$735,989
112	2/1/2027	$65,768	$461,024	$206,877	$733,670
113	3/1/2027	$63,449	$461,024	$206,877	$731,351
114	4/1/2027	$61,130	$461,024	$206,877	$729,032
115	5/1/2027	$58,811	$461,024	$206,877	$726,712
116	6/1/2027	$56,492	$461,024	$206,877	$724,393
117	7/1/2027	$54,172	$461,024	$206,877	$722,074
118	8/1/2027	$51,853	$461,024	$206,877	$719,755
119	9/1/2027	$49,534	$461,024	$206,877	$717,436
120	10/1/2027	$47,215	$461,024	$206,877	$715,116
121	11/1/2027	$44,898	$460,279	$206,543	$711,719
122	12/1/2027	$42,582	$460,279	$206,543	$709,404
123	1/1/2028	$40,267	$460,279	$206,543	$707,088
124	2/1/2028	$37,951	$460,279	$206,543	$704,773
125	3/1/2028	$35,636	$460,279	$206,543	$702,457
126	4/1/2028	$33,321	$460,279	$206,543	$700,142
127	5/1/2028	$31,005	$460,279	$206,543	$697,827
128	6/1/2028	$28,690	$460,279	$206,543	$695,511
129	7/1/2028	$26,374	$460,279	$206,543	$693,196
130	8/1/2028	$24,059	$460,279	$206,543	$690,880
131	9/1/2028	$21,743	$460,279	$206,543	$688,565
132	10/1/2028	$19,473	$442,507	$198,568	$660,548
133	11/1/2028	$17,247	$442,507	$198,568	$658,322
134	12/1/2028	$15,022	$442,507	$198,568	$656,097
135	1/1/2029	$13,531	$151,756	$68,098	$233,385
136	2/1/2029	$12,776	$151,756	$68,098	$232,630
137	3/1/2029	$12,020	$151,756	$68,098	$231,874
138	4/1/2029	$11,264	$151,756	$68,098	$231,118
139	5/1/2029	$10,558	$132,251	$59,346	$202,155
140	6/1/2029	$9,901	$132,251	$59,346	$201,497
141	7/1/2029	$9,244	$132,251	$59,346	$200,840
142	8/1/2029	$8,587	$132,251	$59,346	$200,183
143	9/1/2029	$7,929	$132,251	$59,346	$199,526
144	10/1/2029	$7,272	$132,251	$59,346	$198,869
145	11/1/2029	$6,615	$132,251	$59,346	$198,212
146	12/1/2029	$5,958	$132,251	$59,346	$197,555
147	1/1/2030	$5,301	$132,251	$59,346	$196,898
148	2/1/2030	$4,644	$132,251	$59,346	$196,241
149	3/1/2030	$3,987	$132,251	$59,346	$195,584
150	4/1/2030	$3,335	$130,223	$58,435	$191,993
151	5/1/2030	$2,688	$130,223	$58,435	$191,346
152	6/1/2030	$2,247	$48,833	$21,913	$72,993
153	7/1/2030	$2,012	$48,833	$21,913	$72,758
154	8/1/2030	$1,776	$48,833	$21,913	$72,523
155	9/1/2030	$1,541	$48,833	$21,913	$72,287
156	10/1/2030	$1,306	$48,833	$21,913	$72,052
157	11/1/2030	$1,070	$48,833	$21,913	$71,817
158	12/1/2030	$835	$48,833	$21,913	$71,581
159	1/1/2031	$600	$48,833	$21,913	$71,346

Boston Gas Company
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Boston Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Boston Gas Company

		(a)	(b)	(c)	(e)
		TOTAL GBE			
	Date	Boston Return	Boston Depr	Boston Opex	Totals
160	2/1/2031	$364	$48,833	$21,913	$71,110
161	3/1/2031	$129	$48,833	$21,913	$70,875
162	4/1/2031	$9	$821	$369	$1,199
163	5/1/2031	$6	$821	$369	$1,196
164	6/1/2031	$2	$821	$369	$1,192
165	7/1/2031	$0	$0	$0	$0
166	8/1/2031	$0	$0	$0	$0
167	9/1/2031	$0	$0	$0	$0
168	10/1/2031	$0	$0	$0	$0
169	11/1/2031	$0	$0	$0	$0
170	12/1/2031	$0	$0	$0	$0
171	1/1/2032	$0	$0	$0	$0
172	2/1/2032	$0	$0	$0	$0
173	3/1/2032	$0	$0	$0	$0
174	4/1/2032	$0	$0	$0	$0
175	5/1/2032	$0	$0	$0	$0
176	6/1/2032	$0	$0	$0	$0
177	7/1/2032	$0	$0	$0	$0
178	8/1/2032	$0	$0	$0	$0
179	9/1/2032	$0	$0	$0	$0
180	10/1/2032	$0	$0	$0	$0
181	11/1/2032	$0	$0	$0	$0
182	12/1/2032	$0	$0	$0	$0
183	1/1/2033	$0	$0	$0	$0
184	2/1/2033	$0	$0	$0	$0
185	**Totals**	**$18,428,792**	**$55,322,940**	**$24,825,256**	**$98,576,988**

Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		Test Year Ended December 31, 2016 (Per Books)	Normalizing Adjustments to Test Year	Test Year Ended December 31, 2016 (as Adjusted)
		Gas	Gas	Gas
		(a)	(b)	(c)
	Provider Company:			
1	Colonial Gas Company	$0	$0	$0
2	National Grid USA Service Company	$0	$0	$0
3	All Other Companies	$0	$0	$0
4	Total	$0	$0	$0
5				
6				
7	Operation:			
8	Production Expenses	$0	$0	$0
9	Power Production Expenses	$0	$0	$0
10	Natural Gas Storage, Terminaling	$0	$0	$0
11	and Processing Exp.			
12	Transmission Expenses	$0	$0	$0
13	Regional Market Expenses	$0	$0	$0
14	Distribution Expenses	$0	$0	$0
15	Customer Accounts Expenses	$0	$0	$0
16	Customer Service and	$0	$0	$0
17	Informational Expenses			
18	Sales Expenses	$0	$0	$0
19	Administrative & General Expenses	$0	$0	$0
20	Sub Total	$0	$0	$0
21				
22	Maintenance:			
23	Transmission Expenses	$0	$0	$0
24	Distribution Expenses	$0	$0	$0
25	Administrative & General Expenses	$0	$0	$0
26	Sub Total	$0	$0	$0
27				
28	TOTAL	$0	$0	$0
		$0	$0	$0

Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		Test Year Ended December 31, 2016 (as Adjusted)	Known & Measurable Adjustments	Rate Year Ending April 30, 2019
		Gas	Gas	Gas
		(a)	(b)	(c)
	Provider Company:			
1	Colonial Gas Company	$0	$0	$0
2	National Grid USA Service Company	$0	$2,687,246	$2,687,246
3	All Other Companies	$0	$0	$0
4	Total	$0	$2,687,246	$2,687,246
5				
6				
7	Operation:			
8	Production Expenses	$0	$0	$0
9	Power Production Expenses	$0	$0	$0
10	Natural Gas Storage, Terminaling	$0	$0	$0
11	and Processing Exp.			
12	Transmission Expenses	$0	$0	$0
13	Regional Market Expenses	$0	$0	$0
14	Distribution Expenses	$0	$0	$0
15	Customer Accounts Expenses	$0	$0	$0
16	Customer Service and	$0	$2,687,246	$2,687,246
17	Informational Expenses			
18	Sales Expenses	$0	$0	$0
19	Administrative & General Expenses	$0	$0	$0
20	Sub Total	$0	$2,687,246	$2,687,246
21				
22	Maintenance:			
23	Transmission Expenses	$0	$0	$0
24	Distribution Expenses	$0	$0	$0
25	Administrative & General Expenses	$0	$0	$0
26	Sub Total	$0	$0	$0
27				
28	TOTAL	$0	$2,687,246	$2,687,246
		$0	$0	$0

Line Notes

2(b) Page 3, Line 2

Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		Provider Company	Total
1	Known and Measurable		
2	Gas Business Enablement	National Grid USA Service Company	$2,687,246
3			$0
4			$0
5			$0
6			$0
7			$0
8			$0
9			$0
10			$2,687,246

Line Notes

(2) Page 4, Line 13 (d)

Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(s)	(t)
		HTY	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	Colonial Gas Total	
1	Return on investment	$0	$677	$236,477	$777,718	$853,717	$848,471	$694,641	$570,204	$466,421	$368,969	$271,522	$174,085	$79,084	$29,741	$5,655	$4	$0	$5,377,388	
2	Depreciation	$0	$842	$286,751	$1,091,738	$1,373,835	$1,613,751	$1,614,286	$1,614,286	$1,614,286	$1,614,286	$1,614,286	$1,613,444	$1,327,535	$522,548	$240,451	$535	$0	$16,142,863	
3	Operating expenses	$219,618	$1,029,909	$2,862,666	$1,562,831	$663,967	($69,965)	$725,479	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,994,506	**43.33%**
4																				
5	Total Revenue Requirement	$219,618	$1,031,429	$3,385,895	$3,432,287	$2,891,519	$2,392,258	$3,034,407	$2,184,491	$2,080,707	$1,983,255	$1,885,808	$1,787,529	$1,406,619	$552,289	$246,106	$539	$0	$28,514,756	
6																				
7																				
8																				
9																				
10																				
11					Colonial															
12		5 years	$13,436,232																	
13		Annual recovery			**$2,687,246**															
14																				
15																				
16																				
17																				
18																				
19																				

Line Notes

1	Pages 5 through 8, Column (a)	17	Pages 5 & 6, Column (e), Lines 7 through 42
2	Pages 5 through 8, Column (b)	18	Line 17 divided by 3
3	Forecasted project spend	20	Pages 5 & 6, Column (e), Lines 7 through 30
14	Pages 5 & 6, Column (e), Lines 7 through 66	21	Line 20 divided by 2
15	Line 14 divided by 5		

Column Note

(s) Line 3(r) divided by Line 2(r)

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Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Colonial Gas Company

		(a)	(b)	(c)	(d)
		TOTAL GBE			
	Date	Colonial Return	Colonial Depr	Colonial Opex	Totals
1	11/01/2017	$153	$168	$73	$394
2	12/01/2017	$134	$168	$73	$375
3	01/01/2018	$132	$168	$73	$373
4	02/01/2018	$130	$168	$73	$372
5	03/01/2018	$128	$168	$73	$370
6	04/01/2018	$127	$168	$73	$368
7	05/01/2018	$125	$168	$73	$366
8	06/01/2018	$123	$168	$73	$364
9	07/01/2018	$121	$168	$73	$363
10	08/01/2018	$119	$168	$73	$361
11	09/01/2018	$118	$168	$73	$359
12	10/01/2018	$3,835	$4,269	$1,850	$9,954
13	11/01/2018	$3,372	$4,269	$1,850	$9,490
14	12/01/2018	$3,326	$4,269	$1,850	$9,444
15	01/01/2019	$81,940	$90,978	$39,420	$212,337
16	02/01/2019	$72,124	$90,978	$39,420	$202,522
17	03/01/2019	$71,149	$90,978	$39,420	$201,547
18	04/01/2019	$70,173	$90,978	$39,420	$200,571
19	05/01/2019	$69,198	$90,978	$39,420	$199,596
20	06/01/2019	$68,223	$90,978	$39,420	$198,621
21	07/01/2019	$67,248	$90,978	$39,420	$197,646
22	08/01/2019	$66,273	$90,978	$39,420	$196,671
23	09/01/2019	$65,297	$90,978	$39,420	$195,695
24	10/01/2019	$64,322	$90,978	$39,420	$194,720
25	11/01/2019	$63,347	$90,978	$39,420	$193,745
26	12/01/2019	$62,372	$90,978	$39,420	$192,770
27	01/01/2020	$61,397	$90,978	$39,420	$191,795
28	02/01/2020	$60,421	$90,978	$39,420	$190,819
29	03/01/2020	$59,446	$90,978	$39,420	$189,844
30	04/01/2020	$58,471	$90,978	$39,420	$188,869
31	05/01/2020	$57,496	$90,978	$39,420	$187,894
32	06/01/2020	$82,111	$119,188	$51,643	$252,942
33	07/01/2020	$77,958	$119,188	$51,643	$248,788
34	08/01/2020	$76,680	$119,188	$51,643	$247,511
35	09/01/2020	$75,403	$119,188	$51,643	$246,233
36	10/01/2020	$74,125	$119,188	$51,643	$244,956

Colonial Gas Company
d/b/a National Grid
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Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Colonial Gas Company

		(a)	(b)	(c)	(d)
		TOTAL GBE			
	Date	Colonial Return	Colonial Depr	Colonial Opex	Totals
37	11/01/2020	$72,848	$119,188	$51,643	$243,678
38	12/01/2020	$71,571	$119,188	$51,643	$242,402
39	01/01/2021	$70,295	$119,188	$51,643	$241,125
40	02/01/2021	$69,018	$119,188	$51,643	$239,849
41	03/01/2021	$67,741	$119,188	$51,643	$238,572
42	04/01/2021	$79,625	$134,346	$58,210	$272,180
43	05/01/2021	$76,713	$134,346	$58,210	$269,269
44	06/01/2021	$75,281	$134,346	$58,210	$267,837
45	07/01/2021	$73,998	$134,524	$58,288	$266,810
46	08/01/2021	$72,548	$134,524	$58,288	$265,359
47	09/01/2021	$71,114	$134,524	$58,288	$263,925
48	10/01/2021	$69,691	$134,524	$58,288	$262,503
49	11/01/2021	$68,281	$134,524	$58,288	$261,092
50	12/01/2021	$66,869	$134,524	$58,288	$259,681
51	01/01/2022	$65,703	$134,524	$58,288	$258,515
52	02/01/2022	$64,784	$134,524	$58,288	$257,595
53	03/01/2022	$63,864	$134,524	$58,288	$256,675
54	04/01/2022	$62,944	$134,524	$58,288	$255,756
55	05/01/2022	$62,025	$134,524	$58,288	$254,836
56	06/01/2022	$61,105	$134,524	$58,288	$253,917
57	07/01/2022	$60,186	$134,524	$58,288	$252,997
58	08/01/2022	$59,266	$134,524	$58,288	$252,078
59	09/01/2022	$58,347	$134,524	$58,288	$251,158
60	10/01/2022	$57,427	$134,524	$58,288	$250,238
61	11/01/2022	$56,507	$134,524	$58,288	$249,319
62	12/01/2022	$55,588	$134,524	$58,288	$248,399
63	01/01/2023	$54,668	$134,524	$58,288	$247,480
64	02/01/2023	$53,749	$134,524	$58,288	$246,560
65	03/01/2023	$52,829	$134,524	$58,288	$245,640
66	04/01/2023	$51,910	$134,524	$58,288	$244,721
67	05/01/2023	$50,990	$134,524	$58,288	$243,801
68	06/01/2023	$50,150	$134,524	$58,288	$242,961
69	07/01/2023	$49,390	$134,524	$58,288	$242,201
70	08/01/2023	$48,630	$134,524	$58,288	$241,441
71	09/01/2023	$47,870	$134,524	$58,288	$240,682
72	10/01/2023	$47,110	$134,524	$58,288	$239,922

Colonial Gas Company
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Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Colonial Gas Company

		(a)	(b)	(c)	(d)
		TOTAL GBE			
	Date	Colonial Return	Colonial Depr	Colonial Opex	Totals
73	11/01/2023	$46,351	$134,524	$58,288	$239,162
74	12/01/2023	$45,591	$134,524	$58,288	$238,402
75	01/01/2024	$44,831	$134,524	$58,288	$237,642
76	02/01/2024	$44,071	$134,524	$58,288	$236,883
77	03/01/2024	$43,311	$134,524	$58,288	$236,123
78	04/01/2024	$42,592	$134,524	$58,288	$235,404
79	05/01/2024	$41,915	$134,524	$58,288	$234,726
80	06/01/2024	$41,237	$134,524	$58,288	$234,048
81	07/01/2024	$40,560	$134,524	$58,288	$233,371
82	08/01/2024	$39,883	$134,524	$58,288	$232,695
83	09/01/2024	$39,206	$134,524	$58,288	$232,018
84	10/01/2024	$38,530	$134,524	$58,288	$231,341
85	11/01/2024	$37,853	$134,524	$58,288	$230,664
86	12/01/2024	$37,176	$134,524	$58,288	$229,988
87	01/01/2025	$36,500	$134,524	$58,288	$229,311
88	02/01/2025	$35,823	$134,524	$58,288	$228,634
89	03/01/2025	$35,146	$134,524	$58,288	$227,958
90	04/01/2025	$34,469	$134,524	$58,288	$227,281
91	05/01/2025	$33,793	$134,524	$58,288	$226,604
92	06/01/2025	$33,116	$134,524	$58,288	$225,927
93	07/01/2025	$32,439	$134,524	$58,288	$225,251
94	08/01/2025	$31,763	$134,524	$58,288	$224,574
95	09/01/2025	$31,086	$134,524	$58,288	$223,897
96	10/01/2025	$30,409	$134,524	$58,288	$223,220
97	11/01/2025	$29,732	$134,524	$58,288	$222,544
98	12/01/2025	$29,056	$134,524	$58,288	$221,867
99	01/01/2026	$28,379	$134,524	$58,288	$221,190
100	02/01/2026	$27,702	$134,524	$58,288	$220,514
101	03/01/2026	$27,025	$134,524	$58,288	$219,837
102	04/01/2026	$26,349	$134,524	$58,288	$219,160
103	05/01/2026	$25,672	$134,524	$58,288	$218,483
104	06/01/2026	$24,995	$134,524	$58,288	$217,807
105	07/01/2026	$24,319	$134,524	$58,288	$217,130
106	08/01/2026	$23,642	$134,524	$58,288	$216,453
107	09/01/2026	$22,965	$134,524	$58,288	$215,777
108	10/01/2026	$22,288	$134,524	$58,288	$215,100

Colonial Gas Company
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Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Colonial Gas Company

		(a)	(b)	(c)	(d)
		TOTAL GBE			
	Date	Colonial Return	Colonial Depr	Colonial Opex	Totals
109	11/01/2026	$21,612	$134,524	$58,288	$214,423
110	12/01/2026	$20,935	$134,524	$58,288	$213,746
111	01/01/2027	$20,258	$134,524	$58,288	$213,070
112	02/01/2027	$19,582	$134,524	$58,288	$212,393
113	03/01/2027	$18,905	$134,524	$58,288	$211,716
114	04/01/2027	$18,228	$134,524	$58,288	$211,040
115	05/01/2027	$17,551	$134,524	$58,288	$210,363
116	06/01/2027	$16,875	$134,524	$58,288	$209,686
117	07/01/2027	$16,198	$134,524	$58,288	$209,009
118	08/01/2027	$15,521	$134,524	$58,288	$208,333
119	09/01/2027	$14,845	$134,524	$58,288	$207,656
120	10/01/2027	$14,168	$134,524	$58,288	$206,979
121	11/01/2027	$13,492	$134,355	$58,215	$206,061
122	12/01/2027	$12,816	$134,355	$58,215	$205,386
123	01/01/2028	$12,140	$134,355	$58,215	$204,710
124	02/01/2028	$11,464	$134,355	$58,215	$204,034
125	03/01/2028	$10,788	$134,355	$58,215	$203,358
126	04/01/2028	$10,112	$134,355	$58,215	$202,682
127	05/01/2028	$9,436	$134,355	$58,215	$202,006
128	06/01/2028	$8,760	$134,355	$58,215	$201,330
129	07/01/2028	$8,085	$134,355	$58,215	$200,655
130	08/01/2028	$7,409	$134,355	$58,215	$199,979
131	09/01/2028	$6,733	$134,355	$58,215	$199,303
132	10/01/2028	$6,067	$130,255	$56,438	$192,760
133	11/01/2028	$5,412	$130,255	$56,438	$192,105
134	12/01/2028	$4,757	$130,255	$56,438	$191,450
135	01/01/2029	$4,321	$43,546	$18,868	$66,735
136	02/01/2029	$4,104	$43,546	$18,868	$66,518
137	03/01/2029	$3,888	$43,546	$18,868	$66,301
138	04/01/2029	$3,671	$43,546	$18,868	$66,084
139	05/01/2029	$3,454	$43,546	$18,868	$65,867
140	06/01/2029	$3,237	$43,546	$18,868	$65,651
141	07/01/2029	$3,020	$43,546	$18,868	$65,434
142	08/01/2029	$2,804	$43,546	$18,868	$65,217
143	09/01/2029	$2,587	$43,546	$18,868	$65,000
144	10/01/2029	$2,370	$43,546	$18,868	$64,784
145	11/01/2029	$2,153	$43,546	$18,868	$64,567

Colonial Gas Company
d/b/a National Grid
D.P.U. 17-170
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Colonial Gas Company d/b/a National Grid
New Initiative
Gas Business Enablement
Service Company Rent Expense and Operating Expense
Allocated to Colonial Gas Company

		(a)	(b)	(c)	(d)
		TOTAL GBE			
	Date	**Colonial Return**	**Colonial Depr**	**Colonial Opex**	**Totals**
146	12/01/2029	$1,936	$43,546	$18,868	$64,350
147	01/01/2030	$1,720	$43,546	$18,868	$64,133
148	02/01/2030	$1,503	$43,546	$18,868	$63,916
149	03/01/2030	$1,286	$43,546	$18,868	$63,700
150	04/01/2030	$1,069	$43,546	$18,868	$63,483
151	05/01/2030	$853	$43,546	$18,868	$63,266
152	06/01/2030	$707	$15,336	$6,645	$22,688
153	07/01/2030	$633	$15,336	$6,645	$22,614
154	08/01/2030	$559	$15,336	$6,645	$22,540
155	09/01/2030	$485	$15,336	$6,645	$22,465
156	10/01/2030	$410	$15,336	$6,645	$22,391
157	11/01/2030	$336	$15,336	$6,645	$22,317
158	12/01/2030	$262	$15,336	$6,645	$22,243
159	01/01/2031	$188	$15,336	$6,645	$22,169
160	02/01/2031	$114	$15,336	$6,645	$22,095
161	03/01/2031	$40	$15,336	$6,645	$22,020
162	04/01/2031	$2	$178	$77	$258
163	05/01/2031	$1	$178	$77	$257
164	06/01/2031	$0	$178	$77	$256
165	07/01/2031	$0	$0	$0	$0
166	08/01/2031	$0	$0	$0	$0
167	09/01/2031	$0	$0	$0	$0
168	10/01/2031	$0	$0	$0	$0
169	11/01/2031	$0	$0	$0	$0
170	12/01/2031	$0	$0	$0	$0
171	01/01/2032	$0	$0	$0	$0
172	02/01/2032	$0	$0	$0	$0
173	03/01/2032	$0	$0	$0	$0
174	04/01/2032	$0	$0	$0	$0
175	05/01/2032	$0	$0	$0	$0
176	06/01/2032	$0	$0	$0	$0
177	07/01/2032	$0	$0	$0	$0
178	08/01/2032	$0	$0	$0	$0
179	09/01/2032	$0	$0	$0	$0
180	10/01/2032	$0	$0	$0	$0
181	11/01/2032	$0	$0	$0	$0
182	12/01/2032	$0	$0	$0	$0
183	01/01/2033	$0	$0	$0	$0
184	02/01/2033	$0	$0	$0	$0
	Totals	$5,377,388	$16,142,863	$6,994,505	**$28,514,756**