BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Cases 17-E-0238 and 17-G-0239

August 2017

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Prepared Exhibits of:

Staff Gas Business Enablement Panel

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# List of Exhibits

# Exhibit SGBEP-1

## Table of Contents



[1] Attachments 1 and 3-8 to the response to DPS-654 are marked confidential. Staff does not specifically rely on these attachments, and so has not included them in this exhibit. The attachments can be provided if necessary.

Date of Request: July 20, 2017 Request No. DPS-643 MP-20
Due Date: July 31, 2017 NMPC Req. No. NM-1263

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, Michael Pasinella

TO: National Grid, Gas Infrastructure and Operations Panel

SUBJECT: ***GAS BUSINESS ENABLEMENT***

Request:

In these interrogatories, 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. For each of the previous five calendar years, 2012 through 2016, identify each safety metric violation and, if applicable, each IS program used to manage the task to ensure compliance.

2. For each of the IS programs listed in response to the preceding question, identify the converted IS program included in Gas Business Enablement that will either (i) supersede the currently utilized IS program, or (ii) be newly developed to manage the task to ensure compliance.

3. When will each converted IS program included in Gas Business Enablement and identified in response to DPS-643(2) be placed into service?

4. Explain the forecast of avoided negative revenue adjustments presented in Exhibit__(GIOP-12), Schedule 1, Page 2, by year, and how and when each converted IS program included in Gas Business Enablement produces the benefit.

Response:

1. Please see Attachment 1 for the safety metric violations in calendar years 2012 – 2015. Please note the 2016 operations and records audit findings have not yet been finalized. The attachment includes the IS program used to manage compliance. Note that in the majority of cases, the Company relies on a paper system, as indicated in Attachment 1. Attachment 1 also identifies the GBE component systems that will be used in the future state to manage compliance. An analysis was performed for 2012-2016 records audit years to determine those areas where mobile applications could be used to promote regulatory compliance where code violations were assessed. Mobile applications can replace the current paper based processes that are used by the Company for Gas Repair Orders, Gas Facility Data Reports, Leak Investigation Report Forms, and Warning Tags. User prompts and programming logic can help ensure that all steps are followed in accordance with procedures and data is correctly entered and recorded. The electronic data can then be transferred to the Company's Enterprise Asset Management System, Customer Service System, & Mobility System for follow up remediation and work management.

2. Please see Attachment 1.

3. Implementation of both Mobility (Salesforce) and Enterprise Asset Management System (Maximo) will occur in October 2018. This will coincide with the implementation of the Scheduling and Dispatch System. The solution delivered in October 2018 will provide the capability to perform preventative maintenance/inspection work in the Corrosion and Instrumentation and Regulation areas as well as Customer Meter Services, call center, and account management for up-to-date information on high bill complaints, collections orders, mobile capture of credit card payments. Scheduling, Mobility, Dispatch and Enterprise Asset Management Systems will then be enhanced to include Customer Meter Services work such as meter assets and customer appointments in October 2019.

4. The Company is committed to enhancing gas safety compliance to further protect our customers and employees and improving the results of gas safety audits by implementing systems that will drive continuous improvements by (i) enhancing scheduling and work management, (ii) promoting compliance with applicable regulations and procedures in the field, and (iii) maintaining electronic records that can be easily produced and audited by both the Company and Staff. In the short term, interim processes have been put in place to address non-compliance conditions and prevent them from recurring. As a long term, sustainable solution, the Company has identified GBE investments that will have a significant positive impact on safety and compliance. The forecast shown in Exhibit__ (GIOP-12) reflects the anticipated impact of the systems and the specific capabilities being delivered in each calendar year along with the number of employees receiving the capabilities. By implementing parts of the solution for Corrosion and I&R Work and Company Driven Work: Collections and non-Appointment Offs in 2019, the Corrosion, Instrumentation and Regulation, Customer Meter Services, Call Center and Account Management areas of the business will see significant automation of data recording, validation of entries, and improved work management capabilities. As the program progresses through years 2019 and 2020, the number of employees and business areas that will see scheduling and dispatching, data collection, and overall work management

improvements as the result of less reliance on paper forms and manual/interim processes will increase. Because different business departments will receive the capabilities of the systems on a rolling basis, the forecast presented in Exhibit __ (GIOP-12), Schedule 1, Page 1 and Page 2, reflects the gradual rollout of the implemented solutions to increasing numbers of users beginning FY19 until the solutions are fully embedded by FY23.

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

| Code Section | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | | Current | GBE System | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Violations | Occ's | Violations | Occ's | Violations | Occ's | Violations | Occ's | Violations | Occ's | System | | |
| **Leaks (255.801-831)** | 16 | 40 | 21 | 23 | 24 | 52 | 22 | 33 | 12 | 31 | Paper | Enterprise Asset Mgmt (Maximo) Mobility (Salesforce) | Mobile applications can help reduce leak classification errors, changes in grade, schedule follow up surveillance, prevent unacceptable repair methods, and log leaks found by company |
| **Maintenance (255.701-757)** | 18 | 49 | 24 | 80 | 28 | 184 | 29 | 382 | 22 | 165 | Paper | Enterprise Asset Mgmt (Maximo) Mobility (Salesforce) | **Mobile applications will improve the largely paper-based processes:**<br><br>Leak surveys - Clerical data entry errors<br>Inactive service disconnect - Auto generate due date<br>CI Encroachments - Calculate length of replacement.<br>Regulator inspections - Mandatory field for buried valve inspection.<br>Regulator Station Inspection - Addressed in Cascade System<br>Service Regulator - Mandatory fields for vent inspections |
| **Operations (255.601-631)** | 17 | 32 | 22 | 47 | 13 | 49 | 16 | 74 | 11 | 49 | Paper | Enterprise Asset Mgmt (Maximo) Mobility (Salesforce) | Failure to follow company procedures. Paper Gas Repair Orders not found or retained for six years and repairs not scheduled. Mobile app can correct in on automated basis. |
| **Piping Beyond Meter (261.1-65)** | 4 | 15 | 18 | 24 | 46 | 220 | 19 | 53 | 20 | 63 | MWORK CSS | Customer Mgmt (Salesforce) Mobility (Salesforce) | Mobile application can prevent warning tag errors in classification and auto generate letter notification to building owners when tags issued for apartment buildings.<br><br>MWork Enhancement made for HEFPA notification |
| **Corrosion Control (255.451-491)** | 2 | 11 | 3 | 13 | 2 | 29 | 10 | 95 | 11 | 30 | Paper | Enterprise Asset Mgmt (Maximo) Mobility (Salesforce) | GFDR paper form conversion to mobile application can require mandated field for internal inspection and inspection for extent of external corrosion. |
| | | | | | | | | | | | | | |
| **Total** | 57 | 147 | 88 | 187 | 113 | 534 | 96 | 637 | 76 | 338 | | | |

Date of Request: June 28, 2017 Request No. DPS-430 AT-3
Due Date: July 10, 2017 NMPC Req. No. NM-1003

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) SAVINGS**

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. In Exhibit__(GIOP-12), Schedule 1 page 2, the Company estimates the customer benefits resulting from GBE. For all Type 1 benefits listed, provide the following:
a. The calculation of the projected benefit, by rate year and data year;
b. All assumptions and inputs used when estimating the benefit; and
c. An explanation of the benefit's timing.

2. List any customer benefit(s) from GBE that the Company was unable to quantify in Exhibit__(GIOP-12), but expects to realize with program rollout.

Response:

1. Please see Attachment 1 and the discussion below for the calculation, assumptions, and timing of each of the Type 1 benefits in Exhibit __ (GIOP-12), page 2.

Asset – Advanced Analytics - Reduction / Redirection in OPEX via AIPM

Delivery of an integrated Asset Investment Planning and Management tool with advanced analytics capabilities is intended to improve National Grid's ability to incorporate asset health and performance factors into its investment plan. For

purposes of calculating Type I benefits, National Grid assumed that improved investment planning will result in a reduction in controllable opex spend through increased efficiencies in delivering capital investments and more informed repair vs. replace decisions. The calculation of the full benefit ("Total Annual Benefit") once the enabling solutions are fully embedded, as reflected in the "Asset Analytics OpEx" tab of Attachment 1, was based on an estimated percentage reduction in the annual controllable OPEX spend (utilizing the total gas O&M spend for Niagara Mohawk in FY2017). The estimated percentage reduction was based on the expertise of internal gas business and GBE team subject matter experts, as well as on the expert judgment and expertise of National Grid's external partners.

Benefits for Niagara Mohawk phase-in beginning FY21 and Total Annual Benefits will not be realized for a full year until FY23, as reflected in the "Benefits – Detailed" tab of Attachment 1 and Exhibit __ (GIOP-12), page 2. The timing of the benefits is based on the current planned implementation schedule for the enabling asset management, data, financial integration, GIS and mobile GBE solutions, and functionality planned for Niagara Mohawk. In addition, the timing of the realization of full benefits is due to "new" history that must be created to collect and analyze data under the new systems to enable better decision making.

Engineering Design, Estimating and Mobility / Reduction in Damages due to Data Quality Errors

National Grid collects and retains information on the number of damages due to data quality errors. Each of these damages requires a repair of some sort to be made by National Grid personnel. Calculation of the estimated benefit was performed by using the actual number of mismarks due to records and locate errors from CY13-15 and comparing that to American Gas Association ("AGA") 3-year average published in 2015 for similar size companies. The benefits assume National Grid will move closer to the AGA average of number of mismarks by 50%. The target level of improvement would place the Company's gas business at the median of its peer set within the AGA information.
The 3-year average Niagara Mohawk cost was then applied to the number of reduced damages. The calculation of the full benefit ("Total Annual Benefit") once the enabling solutions are fully embedded is reflected in the "Data Management Damage" tab of Attachment 1. A capital/operating expense split is applied at 45/55% based on historical cost splits to arrive at the total annual Type I operating savings once benefits are fully embedded (reflected in the "O&M Benefits" column of tab "Benefits – Detailed" tab of Attachment 1).

Benefits for Niagara Mohawk phase-in beginning FY19 and Total Annual Benefits will not be realized for a full year until FY20, as reflected in the "Benefits – Detailed" tab of Attachment 1 and Exhibit __ (GIOP-12), page 2. The timing of the benefit was based on the current planned implementation schedule

for the enabling asset management, GIS, data and system integration GBE solutions, and functionality planned for Niagara Mohawk.

Work Management and Field Enablement / Clerical/Back Office Productivity Improvement

Because few of the systems currently used by National Grid are integrated, even data captured electronically needs to be entered manually into multiple systems. This manual effort will be greatly reduced with implementation of the new platforms. Calculation of the estimated benefit once fully embedded ("Total Annual Benefit") was performed by using an estimated productivity increase of two hours saving per day associated with implementation of the new platforms and applying the productivity increase to Niagara Mohawk's total annual costs for clerks (determined by multiplying the total annual hours of Niagara Mohawk clerks by the average daily rate for the clerical/back office job classifications). The calculation is detailed in tab "Clerical Productivity" of Attachment 1. A capital/operating expense split is applied at 32/68% based on historical cost splits to arrive at the total annual Type I operating savings once benefits are fully embedded (reflected in the "O&M Benefits" column of tab "Benefits – Detailed" tab of Attachment 1). The estimated productivity increase of two hours of savings per day was determined by subject matter experts within the Company's gas business, members of the GBE project team, and external consulting partners.

Benefits for Niagara Mohawk phase-in beginning FY20 and Total Annual Benefits will not be realized for a full year until FY22, as reflected in the "Benefits – Detailed" tab of Attachment 1. The timing of the benefit was based on the current planned implementation schedule for the enabling GBE work management and system integration solutions and functionality planned for Niagara Mohawk that allow field data to be transferred to customer, work management, and payroll systems among others.

Please note that in the course of preparing this response, the Company realized that it inadvertently utilized the "Total Annual Benefits" calculated for the gas segment of the Narragansett Electric Company in the Type I benefits reflected in Exhibit __ (GIOP-12), page 2. In the tab, "Corrected GIOP-12 Page 2," tab of Attachment 1, the Company includes the appropriate allocation for Niagara Mohawk for this Type I benefit. Because the error was only recently discovered, this correction is not reflected in the Company's July 10, 2017 Corrections and Updates filing.

Work Management and Field Enablement / Damage Prevention – Reduced Travel Mileage

The actual routes driven by technicians for Niagara Mohawk were sampled. These same routes were then analyzed by routing optimization software to obtain an optimized travel plan for technicians to follow. A mileage reduction percentage was determined based on the difference between the routes actually driven by the technicians and the routes identified by the routing optimization software. Calculation of the estimated benefit when fully embedded ("Total Annual Benefit") was performed by applying the mileage reduction percentage to the average number of miles driven between jobs for Niagara Mohawk damage prevention workers. The calculation is detailed in tab "Damage Prevention Travel" of Attachment 1. A capital/operating expense split of 19/81% (based on historical cost splits) was used to arrive at the total annual Type I operating savings once benefits are fully embedded (reflected in the "O&M Benefits" column of tab "Benefits – Detailed" tab of Attachment 1).

Benefits for Niagara Mohawk phase-in beginning FY20 and Total Annual Benefits will not be realized for a full year until FY21, as reflected in the "Benefits – Detailed" tab of Attachment 1 and Exhibit __ (GIOP-12), page 2. The timing of the benefit was based on the current planned implementation schedule for the enabling GBE work management, field mobility, and dispatch, solutions and functionality planned for Niagara Mohawk.

Work Management and Field Enablement / M&C Productivity Improvements – Base

Current data capture in the field is inefficient due to the use of paper forms and outdated field devices. Implementation of the new platforms will enable field technicians to capture field information more efficiently by taking advantage of current technology. Also, integration of systems will allow technicians to find relevant job information in an expedited fashion rather than searching individually in multiple systems to find the information. To calculate the benefit, the Company assumed that the use of new technology will reduce the time required to enter data on paper forms and outdated field devices. The calculation of the full benefits applies a 3% improvement to total hours worked by field technicians to arrive at the hours reduction in overtime. Applying the hours reduction in overtime at the hourly overtime rate results in the "Total Annual Benefit" shown in the "M&C Productivity Improve" tab in Attachment 1. A capital/operating expense split is applied at 45/55% based on historical cost splits to arrive at the total annual Type I operating savings once benefits are fully embedded (reflected in the "O&M Benefits" column of tab "Benefits – Detailed" tab of Attachment 1). The estimated 3% improvement was based on the expertise of internal gas business and GBE team subject matter experts, as well as on the expert judgment and expertise of our external partners.

Benefits for Niagara Mohawk phase-in beginning FY20, as reflected in in the "Benefits – Detailed" tab of Attachment 1 and Exhibit __ (GIOP-12), page 2 with

Total Annual Benefits not realized for a full year until FY22. The timing of the benefit was based on the current planned implementation schedule for the enabling GBE work management, data, financial integration, GIS and mobile solutions GBE initiatives, and functionality planned for Niagara Mohawk. In addition, the timing in the realization of full benefits reflects the time field supervisors, dispatchers, technicians, and crews, as well as clerks will need to become fully trained and proficient in the new software, processes, and systems.

2. There are many benefits of the GBE program that cannot be quantified. First and foremost, GBE addresses the significant and increasing risk of using aging and unsupported information systems to support the gas business.

   These benefits are described in the Pre-Filed Testimony of the GIOP Panel, most prominently pp. 87 – 92, 94, and 102 – 103 and Exhibit __ (GIOP-9). Some examples of specific customer and operational benefits are noted below.

   - Interactions between Company personnel and customers will change dramatically. Integrated systems will contain information not only about work being performed at a customer's premise, but about work being performed in the customer's neighborhood. With GBE, customer representatives will be able to view work (rather than calling field supervision for an explanation), and can explain the circumstances to the customer.

   - With GBE, customers will have expanded opportunities to schedule appointments with the Company for service. In addition, contact with the customer as the appointment approaches will significantly reduce missed and rescheduled appointments.

   - Records will be kept in GBE systems that will show the work that needs to be done at a customer's premise, and work can be combined in a single visit, thus reducing inconvenience to customers.

   - Customers will be able to communicate with the Company through multiple channels, such as online, land telephone, mobile telephone, and text.

   - When considering conversion to gas, customers will be able to take advantage of online estimating tools to assist them in reaching a decision.

   - Customers and field workers will be able to attach photographs and documents to communications vs. paper copies, mail, or in-person visits.

Name of Respondent:
Johnny Johnston

Date of Reply:
July 10, 2017

Corrected GIOP-12 Page 2

Niagara Mohawk Power Corporation d/b/a National Grid
Gas Business Enablement
Customer Benefits - Forecasted for Niagara Mohawk Power Corporation
For Rate Year Ending March 31, 2019 and Data Years Ending March 31, 2020 and 2021

| Line | Benefit Description | Benefit Type | 12-Months Ending March 31, 2019 | 12-Months Ending March 31, 2020 | 12-Months Ending March 31, 2021 |
|---|---|---|---|---|---|
| 1 | Clerical / Back Office Productivity Improvement | Type I | $0 | $1,706 | $105,767 |
| 2 | Damage Prevention - Reduced Travel Mileage | Type I | $0 | $4,627 | $6,169 |
| 3 | M&C Productivity Improvements - Base | Type I | $0 | $124,375 | $883,064 |
| 4 | Reduction / Redirection in Opex via AIPM | Type I | $0 | $0 | $2,279 |
| 5 | Reduction in Damages due to Data Quality Errors | Type I | $6,937 | $27,748 | $27,748 |
| 6 | | | $6,937 | $158,456 | $1,025,028 |
| 7 | | | | | |
| 8 | All Type I Benefits Included in Revenue Requirement, Exhibit____(RRP-3), Schedule 27 | | $6,937 | $158,456 | $1,025,028 |
| 9 | | | | | |
| 10 | *Revised Clerical / Back Office Productivity Improvement | Type I | $0 | $2,957 | $183,329 |
| 11 | | | | | |

12 *In Exhibit __ (GIOP-12), Page 2, Narragansett benefit estimate was used in error. Above is the corrected NMPC benefit.

Benefits - Detailed

| Work Stream | Initiative | Operating Company | Value Lever | Value Lever Detail | Benefit Lookup Field | Benefit Type | Capital / O&M | % | Work Type | Total Benefits | O&M Benefits | Benefit Start Month | Month Index | Benefit Ramp Months | On/Off | a | a | a | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | a | Row |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Work Management | Work Management & Field Enablement | NiagaraMohawk Gas | Increase Clerk / Backoffice Productivity | Clerical / Back Office Productivity Improvement | NiagaraMohawk GasClerical / Back Office Productivity Improvement | Type 1 | O&M | 68% | Clerk | $313,086 | $212,899 | 4/1/20 | 39 | 6 month | TRUE | | | | $0 | $0 | $0 | $2,957 | $183,329 | $212,899 | $212,899 | $212,899 | $212,899 | $212,899 | $159,674 | | 2 |
| Work Management | Work Management & Field Enablement | NiagaraMohawk Gas | Reduced Fleet Costs | Damage Prevention - Reduced Travel Mileage | NiagaraMohawk GasDamage Prevention - Reduced Travel Mileage | Type 1 | O&M | 81% | Damage Prevention | $7,617 | $6,169 | 7/1/19 | 30 | 3 month | TRUE | | | | $0 | $0 | $0 | $4,627 | $6,169 | $6,169 | $6,169 | $6,169 | $6,169 | $6,169 | $4,627 | | 3 |
| Work Management | Work Management & Field Enablement | NiagaraMohawk Gas | Field Productivity | M&C Productivity Improvements - Base | NiagaraMohawk GasM&C Productivity Improvements - Base | Type 1 | O&M | 55% | Maintenance and Construction | $1,628,185 | $895,502 | 1/1/20 | 36 | 6 month | TRUE | | | | $0 | $0 | $0 | $124,375 | $883,064 | $895,502 | $895,502 | $895,502 | $895,502 | $895,502 | $671,626 | | 4 |
| Asset Management | Asset - Advanced Analytics | NiagaraMohawk Gas | OpEx Requirement Reduction/Redirection | Reduction / Redirection in Opex via AIPM | NiagaraMohawk GasReduction / Redirection in Opex via AIPM | Type 1 | O&M | 100% | M&C - All Opex Jobs | $328,242 | $328,242 | 4/1/21 | 51 | 12 month | TRUE | | | | $0 | $0 | $0 | $0 | $2,279 | $202,872 | $328,242 | $328,242 | $328,242 | $328,242 | $246,181 | | 5 |
| Asset Management | Engineering, Design, Estimating & Mobility | NiagaraMohawk Gas | Reduced Damages | Reduction in Damages due to Data Quality Errors | NiagaraMohawk GasReduction in Damages due to Data Quality Errors | Type 1 | O&M | 55% | M&C Construction Jobs | $50,451 | $27,748 | 1/1/19 | 24 | 3 month | TRUE | | | | $0 | $0 | $6,937 | $27,748 | $27,748 | $27,748 | $27,748 | $27,748 | $27,748 | $27,748 | $20,811 | | 6 |

Note
Month Index is measured as the number of months from GBE Program start-up and corresponds to the Benefits Start Month

Asset Analytics OpEx

Reduction / Redirection in Opex

| | FY2017 Controllable O&M [1] | % of Total Opex | % Reduction | Benefits |
|---|---|---|---|---|
| Boston Gas | $ 76,358,000 | 32% | 0.82% | $ 628,814 |
| Colonial Gas | $ 10,443,000 | 4% | 0.82% | $ 85,999 |
| Brooklyn Union Gas (KEDNY) | $ 74,664,000 | 31% | 0.82% | $ 614,864 |
| Keyspan Gas East (KEDLI) | $ 25,587,000 | 11% | 0.82% | $ 210,711 |
| NiagaraMohawk Gas | $ 39,859,000 | 17% | 0.82% | $ 328,242 |
| Narragansett Gas | $ 13,524,000 | 6% | 0.82% | $ 111,371 |
| Total | $ 240,435,000 | | | $ 1,980,000 |

Assumptions / Sources / Notes
1 Source: US Gas OpEx Review 201609 September (06+06) with Forecast

Data Management Damage

Improved Data Quality - Record Error Damages - M&C Complex Engineering Jobs [1]

| | | 2013 | | 2014 | | 2015 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Op Co | Category | # of Errors | Cost | # of Errors | Cost | # of Errors | Cost | 3 yr Average | % Reduction to Median [3] | % Reduction Estimated for NG | Potential Savings |
| UNY | Mismark - Record Errors | 4 | $ 14,354 | 38 | $ 89,690 | 41 | $ 241,907 | $ 115,317 | 88% | 44% | $ 50,451 |
| UNY | Mismark - Locator Errors (Internal) | | $ - | | $ - | | $ - | $ - | 40% | 20% | $ - |
| NYC | Mismark - Record Errors | 46 | $ 25,698 | 54 | $ 20,492 | 60 | $ 20,181 | $ 22,124 | 88% | 44% | $ 9,679 |
| NYC | Mismark - Locator Errors (Internal) | 3 | $ 700 | | $ - | | $ - | $ 233 | 40% | 20% | $ 47 |
| LI | Mismark - Record Errors | 52 | $ 84,517 | 63 | $ 514,509 | 70 | $ 169,928 | $ 256,318 | 88% | 44% | $ 112,139 |
| LI | Mismark - Locator Errors (Internal) | 4 | $ 5,339 | 6 | $ 15,866 | | $ - | $ 7,069 | 40% | 20% | $ 1,422 |
| MA | Mismark - Record Errors | 139 | $ 465,112 | 139 | $ 379,541 | 123 | $ 300,815 | $ 381,823 | 88% | 44% | $ 167,048 |
| MA | Mismark - Locator Errors (Internal) | 3 | $ 3,408 | 2 | $ 577 | | $ - | $ 1,328 | 40% | 20% | $ 267 |
| RI | Mismark - Record Errors | 23 | $ 376,726.87 | 29 | $ 475,003.44 | 45 | $ 737,074 | $ 529,602 | 88% | 44% | $ 231,701 |
| RI | Mismark - Locator Errors (Internal) | 1 | $ 1,884.92 | 2 | $ 3,769.84 | 1 | $ 1,885 | $ 2,513 | 40% | 20% | $ 506 |
| Total | Total Mismark - Record Errors | 264 | $ 966,409 | 323 | $ 1,479,236 | 339 | $ 1,469,905 | $ 1,305,183 | 88% | 44% | $ 571,018 |
| Total | Total Mismark - Locator Errors | 11 | $ 11,332 | 10 | $ 20,213 | 1 | $ 1,885 | $ 11,143 | 40% | 20% | $ 2,241 |
| TOTAL | | | | | | | | $ 1,316,327 | | | $ 573,259 |

| | | |
|---|---|---|
| RI | Average Cost of Mismark - Record Errors | $ 16,379 |
| RI | Average Cost of Mismark - Locator Errors (Internal) | $ 1,885 |

| Damage Benchmarking [2] | National Grid Gas Performance - # of Damages 2015 | Quartile Ranking per AGA Gas Peers | Median per AGA Gas Peers | Range per AGA Gas Peers | Reduction in # of Damages Needed to Move to the Median [3] |
|---|---|---|---|---|---|
| Number of Damages due to Locate Errors – Mains | 11 | 2nd | 13 | 3 to 197 | 0% |
| Number of Damages due to Locate Errors – Services | 76 | 3rd | 39 | 17 to 380 | 49% |
| Number of Damages due to Record Errors – Mains | 43 | 4th | 9 | 0 to 71 | 79% |
| Number of Damages due to Record Errors – Services | 293 | 4th | 33 | 0 to 354 | 89% |
| Total Number of Damages due to Record Errors | 336 | | 42 | | 88% |
| Total Number of Damages due to Locate Errors | 87 | | 52 | | 40% |

Benefity by Operating Company

| | |
|---|---|
| Boston Gas * | $ 137,198 |
| Colonial Gas * | $ 30,117 |
| Brooklyn Union Gas (KEDNY) | $ 9,726 |
| Keyspan Gas East (KEDLI) | $ 113,561 |
| NiagaraMohawk Gas | $ 50,451 |
| Narragansett Gas | $ 232,206 |
| Total | $ 573,259 |

Assumptions / Sources / Notes

1 Source: Report of damages provided by Matthew Murlin (Sr. Analyst, Misc & Special Billing), Robert Tejeson (Manager Damage Prevent LI), and Steven Bennett (Manager Damage Prevention NE Gas)

2 Benchmarking of damages performed by Accenture using 2015 AGA data

3 Possible reduction in damages is estimated to move National Grid Gas to the median of its peer set per 2015 AGA data; agreed / confirmed by Nick Raad

4 Boston Gas and Colonial Gas benefits split based on the general allocator %s (Boston Gas - 82%, Colonial Gas - 18%)

Clerical Productivity

Improved Clerical / Back Office Productivity - All M&C and CMS Jobs

| Operating Company | # of Clerks / Work Support [1] | # of Annual Workdays per Clerk | Total # of Workdays | Total $ | Productivity Improvement as a Result of New Platforms & Mobile Devices [2] | Clerical Hourly Rate [3] | Productivity Benefits |
|---|---|---|---|---|---|---|---|
| Boston Gas Company | 69 | 240 | 16,560 | $ 3,323,529 | 25% | $ 25.09 | $ 830,882 |
| Colonial Gas Company | 17 | 240 | 4,080 | $ 818,840 | 25% | $ 25.09 | $ 204,710 |
| Brooklyn Union Gas-KEDNY | 28 | 240 | 6,720 | $ 1,348,678 | 25% | $ 25.09 | $ 337,170 |
| KS Gas East Corp-KEDLI | 22 | 240 | 5,280 | $ 1,059,676 | 25% | $ 25.09 | $ 264,919 |
| Narragansett Electric Co | 15 | 240 | 3,600 | $ 722,506 | 25% | $ 25.09 | $ 180,627 |
| Niagara Mohawk Power Corp | 26 | 240 | 6,240 | $ 1,252,344 | 25% | $ 25.09 | $ 313,086 |
| Total | 177 | | 42,480 | $ 8,525,574 | | | $ 2,131,393 |

Benefity by Operating Company

| | |
|---|---|
| Boston Gas | $ 830,882 |
| Colonial Gas | $ 204,710 |
| Brooklyn Union Gas (KEDNY) | $ 337,170 |
| Keyspan Gas East (KEDLI) | $ 264,919 |
| NiagaraMohawk Gas | $ 313,086 |
| Narragansett Gas | $ 180,627 |
| Total | $ 2,131,393 |

Assumptions / Sources / Notes

1 # of Clerks derived from HRIS extract provided by J'Wynn DeRamos; resources with Clerk or "CLK" in their titles in M&C, CMS, and Ops Support / Work Support were counted in this analysis

2 Estimate of % productivity improvement as result of new platforms and mobile devices provided by Danielle Morrissey and Mark Scaparotti

3 Clerk rate provided by NG Finance; hourly rate assumes an average for that category of employee if there were multiple titles / levels (e.g., Clerk, CMS Clerk, etc.)

Damage Prevention Travel

Reduced Drive Time and Reduced Mileage - M&C Damage Prevention Jobs

| | | | Travel Time | | | | | | | | Mileage | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Opex | Category | Units (Mains = Miles, Services = Units) [1] | Travel Mins Per Job [2] | Total Travel Mins | Cost Basis | Travel Time Reduction [3] | Total Time Saved in Mins | Field Woker Hourly Rate [4] | Travel Time Benefits | Miles Per Job [2] | Assumed Miles Driven | Cost Basis | Reduction [3] | Miles Reduced | Cost Per Mile [5] | Fleet Benefits |
| Boston Gas | Damage Prevention | 130,880 | 14 | 1,832,320 | $1,066,716 | 2.5% | 45,808 | $ 34.93 | $ 26,668 | 4.17 | 546,410 | $ 377,023 | 2.5% | 13,660 | $ 0.69 | $ 9,426 |
| Colonial Gas | Damage Prevention | 47,609 | 14 | 666,526 | $ 388,029 | 2.5% | 16,663 | $ 34.93 | $ 9,701 | 4.17 | 198,763 | $ 137,146 | 2.5% | 4,969 | $ 0.69 | $ 3,429 |
| KEDNY | Damage Prevention | 190,066 | 11 | 2,090,726 | $1,217,151 | 2.5% | 52,268 | $ 34.93 | $ 30,429 | 4.17 | 793,505 | $ 547,519 | 2.5% | 19,838 | $ 0.69 | $ 13,688 |
| KEDLI | Damage Prevention | 154,225 | 10 | 1,542,250 | $ 897,847 | 2.5% | 38,556 | $ 34.93 | $ 22,446 | 4.17 | 643,873 | $ 444,272 | 2.5% | 16,097 | $ 0.69 | $ 11,107 |
| Niagara Mohawk | Damage Prevention | 105,761 | 13 | 1,374,893 | $ 800,417 | 2.5% | 34,372 | $ 34.93 | $ 20,010 | 4.17 | 441,541 | $ 304,663 | 2.5% | 11,039 | $ 0.69 | $ 7,617 |
| RI | Damage Prevention | 61,581 | 12 | 738,972 | $ 430,205 | 2.5% | 18,474 | $ 34.93 | $ 10,755 | 4.17 | 257,094 | $ 177,395 | 2.5% | 6,427 | $ 0.69 | $ 4,435 |
| TOTAL BENEFITS | | 690,122 | | 8,245,687 | $4,800,364 | | 206,142 | | $ 120,009 | | 2,881,186 | $1,988,018 | | 72,030 | | $ 49,700 |

Assumptions / Sources / Notes

1 Source: US Gas OpEx Review 201609 September (06+06) with Forecast

2 Travel time and miles per job for damage prevention is assumed to be similar to CMS planned work by OpCo; travel time and miles per job is not tracked for M&C

3 Damage prevention % reduction is assumed to be similar to the % reduction for CMS planned work which was calculated using OptimoRoute software; assumption based on the fact that damage prevention resources can be pulled for emergent work

4 Tech rate provided by NG Finance; hourly rate assumes an average for that category of employee if there were multiple titles / levels (e.g., Field Tech, Mechanic, etc.)

5 Fleet cost for mile provided by Joseph Nicoletti, Supply Chain / Fleet; cost includes fuel, parts, and external maintenance only

M&C Productivity Improve

Field Productivity Improvement via Improved Platforms - All M&C Work Types

| | Straight Hours [1, 5] | OT Hours [5] | Total Hours | % of OT | Improvement Rate [2] | Improvement in Productivity: Hours of Improvement | Improvement in Productivity: Benefit |
|---|---|---|---|---|---|---|---|
| Boston Gas | 1,116,603 | 401,446 | 1,518,048 | 26% | 3.00% | 33,498 | $ 1,755,132 |
| Colonial Gas | 177,186 | 53,456 | 230,641 | 23% | 3.00% | 5,316 | $ 278,509 |
| KEDNY * | 1,231,360 | 320,889 | 1,552,249 | 21% | 3.00% | 36,941 | $ 1,935,513 |
| KEDLI * | 765,440 | 180,086 | 945,526 | 19% | 3.00% | 22,963 | $ 1,203,157 |
| Niagara Mohawk * | 1,035,840 | 85,349 | 1,121,189 | 8% | 3.00% | 31,075 | $ 1,628,185 |
| RI | 366,822 | 133,904 | 500,726 | 27% | 3.00% | 11,005 | $ 576,589 |
| Totals | 4,693,250 | 1,175,129 | 5,868,379 | 20% | 3.00% | 140,798 | $ 7,377,085 |

| | Hourly Rate [3] | Hours per year | Annual Rate |
|---|---|---|---|
| Annual Rate | $ 34.93 | 2080 | $ 72,654 |
| OT Rate | $ 52.40 | 2080 | $ 108,982 |

Field Techs [4]

| | |
|---|---|
| Boston Gas Company | 698 |
| Colonial Gas Company | 108 |
| Brooklyn Union Gas-KEDNY | 592 |
| KS Gas East Corp-KEDLI | 368 |
| Niagara Mohawk Power Corp | 498 |
| Narragansett Electric Co | 206 |
| Grand Total | 1876 |

Assumptions / Sources / Notes

1 For KEDNY, KEDLI, and Niagara Mohawk, calculated straight hours = # of field techs * 2080 hours per year

2 3% improvement rate = 15 minutes per day (480 minutes * 3%); % used is estimated based on time spent performing data capture with a crew size of 3 (5 minutes per person)

3 Tech rate provided by NG Finance; hourly rate assumes an average for that category of employee if there were multiple titles / levels (e.g., Field Tech, Mechanic, etc.)

4 # of Field Techs derived from HRIS extract provided by J'Wynn DeRamos; Field Techs in this benefit stream include I&R, Corrosion, and M&C Techs, Inspectors and Damage Prevention excluded

5 Source for Hours: NY - Yuan Zhou (Finance Business Partners- NY Budgeting & Forecasting) & Phillip Jeffrey; MA & RI - James Loschiavo (Financial Planning & Partnering)

Date of Request: June 28, 2017 Request No. DPS-431 AT-4
Due Date: July 10, 2017 NMPC Req. No. NM-1004

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, Andrew Timbrook

TO: National Grid, Gas Information Systems Panel

SUBJECT: **GAS BUSINESS ENABLEMENT (GBE) – COST ESTIMATION**

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.

Concerning the cost estimation process for the proposed GBE program, provide the following:
a. A description of Accenture & PwC's roles in the cost estimation process;
b. Any inputs and assumptions used to estimate program costs;
c. The historic performance of Accenture when estimating the costs of similar programs; and
d. Explain how the Company verified that the cost estimates were reasonable.

Response:

a. As noted in the initial testimony of the Gas Infrastructure and Operations Panel, National Grid worked with two of the top system integrators ("SI") in the U.S., Accenture and PwC, to complete a high-level design and develop a roadmap for the Gas Business Enablement ("GBE") Program.

   Accenture
   Accenture was selected as the Strategic Assessment (Design) partner to help develop the high-level design, road map, and business case. In support of these efforts, Accenture's role included consulting on the current state/gap analysis, future state technical design,

implementation approach, change analysis/strategy, risk analysis, and draft work packet for the SI.

Cost estimates for the GBE Program were developed by Accenture utilizing its proprietary "Delivery Estimator" model described in Attachment 1. Costs were developed utilizing a bottom-up approach for each initiative that included (i) the labor effort required (as determined by Accenture from their 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 discussed further in response to part (d), as part of the development of cost estimates described above, Accenture validated the estimates by comparing them to their actual experience with other programs of similar size and scope.

PwC
PwC was selected as a business assurance partner for National Grid to provide additional assurance that the business design/roadmap developed for GBE is "fit-for-purpose" and meets National Grid's requirements for business functionality, deliverability (including risk management), and cost efficiency. PwC's role included reviewing and analyzing business/technology and project design alignment; market and best practices; design flexibility and process; implementation strategy; integration plan; design process; and risk analysis. Attachment 2 includes PwC's Stage Gate Report ("Report") on the Future State Design and Scope and Roadmap for GBE. Attachment 3 is National Grid's response to PwC's report. A key finding of PwC's Report was that the cost estimate for GBE was appropriate compared with the total costs of other industry benchmarks of similar scale projects. PwC also noted that the final version of the SI Work Package provides the level of information necessary for SIs to understand the full scope of the GBE Program and to enable National Grid to compare equivalent bids.

The following are other key assurance findings in PwC's Report:

- the solution design was based on industry leading software applications that can support National Grid's GBE Program objectives;
- the proposed GBE roadmap work streams and initiatives provide a program scope well matched to achieve the targeted objectives of GBE;
- the initiative scope goes beyond process and technology to address gaps across the full set of elements of the required core operational business capabilities; and
- the 4.5 year deployment duration in the roadmap work streams and initiative listing is achievable.

b. Please see response to part (a) and Attachment 4.

c. Please see page 5 of Attachment 1.

d. The Company has verified and plans to continue to validate that cost estimates are reasonable throughout the Program's life cycle:

- As described above, the Company retained Accenture to help develop and validate cost estimates for the GBE Program. As shown in Attachment 1, Accenture's estimates of prior similar projects were within acceptable variance ranges.

- Importantly, National Grid provided Accenture much of the raw data from workshops with the business on the technology gaps. In addition, National Grid's internal GBE team engaged representatives from Information Services departments, including Enterprise Architecture, Strategic Solution Delivery, Service Delivery, and Digital Risk and Security to review technical and cost outputs. Also included in the review were representatives from the Company's Asset Management and Process Excellence teams, with experience in work and asset management platforms, financial systems, field force systems, meter management, and GIS.

- In addition, National Grid partnered with PwC, another highly experienced system integrator, to review the cost estimates and SI work packages to provide additional assurance that cost estimates were reasonable and assurance that the SI work packages would allow National Grid to pursue a rigorous competitive procurement process.

- Finally, as the GBE Program proceeds into design and implementation, National Grid will utilize a competitive procurement process for change leadership and ten key modules of GBE including: Work Management, Asset Management, Customer Engagement, GIS, and Supply Chain and Data Management. In addition, National Grid will competitively bid any core software, hardware, infrastructure, and application products and alternatives available in the market.

Name of Respondent:
Johnny Johnston

Date of Reply:
July 10, 2017

# CONFIRMATION OF ACCENTURE ESTIMATE ACCURACY

June 14, 2017

accenture

nationalgrid

# VERIFICATION OF ACCURACY OF ACCENTURE ESTIMATORS

Accenture employs robust and industrialized calibration processes for our estimators in order to ensure accuracy of the estimates we produce.

- Accenture conducts two ongoing processes to enable accuracy of its estimating tools:

| Harvesting | Calibration |
| --- | --- |
| Conduct periodic harvests of actuals from projects for specific technologies and platforms | Collaborate with practice sponsors to update factors in the estimators to better align with actuals |

The estimators are re-certified every 2 years based on harvesting and calibration of at least 6 projects within that timeframe



accenture



nationalgrid 2

# COST ESTIMATING OF GBE PROGRAM



- GBE program costs were estimated using Accenture Delivery Estimators built up using bottom-up details for all initiatives

**Effort**

The labor effort for each initiative was estimated using one of 2 distinct approaches:

1. Factor-based estimates using Accenture Development Methodology estimators to create a detailed resource plan

2. Capacity-based estimates using historical experience aligned to initiative scope to create a detailed resource plan

**Software / Hardware**

Software and hardware estimates used the latest vendor quoted prices where possible; Accenture experience used where vendor quoted prices were not available

**Rates**

Labor rates were applied to labor effort and were derived from 2 sources:

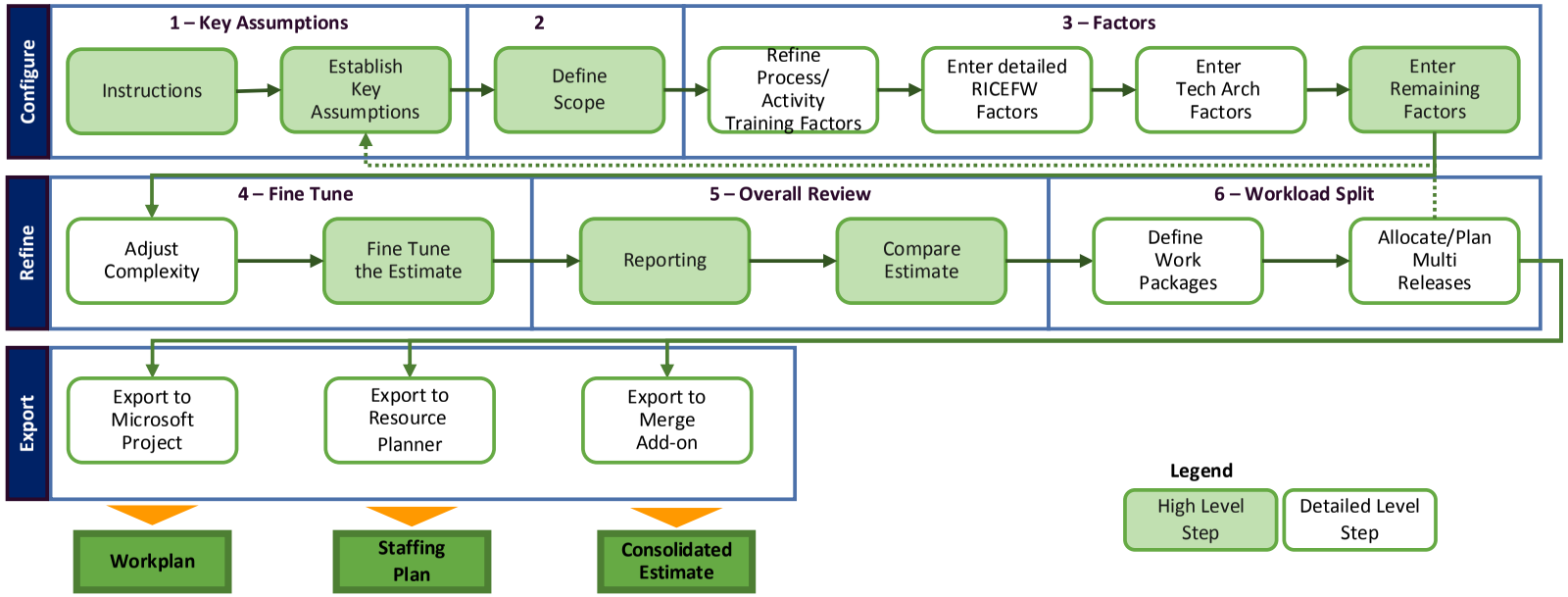
1. National Grid current daily labor rates for various roles and levels validated by National Grid Finance
2. External SI daily labor rates calculated by Accenture based on typical “market rates”

***Costs were compared with other transformation programs to validate program costs based on program scope***

# ACCENTURE DEVELOPMENT METHODOLOGY ESTIMATOR APPROACH



Accenture's employs a standard approach within its Development Methodology Estimators




- Accenture Develop Methodology Estimators are maintained and updated to reflect our experience with actual implementation effort to ensure estimated effort reflects actual effort as closely as possible

# COST ESTIMATE COMPARISONS

| Solution Component | NG Estimate Approach | National Grid | Utility A | Utility B | Utility C |
|---|---|---|---|---|---|
| Scope | | - 6 OpCos<br>- 3 states<br>- Gas Only (includes Electric CMS), D Only | - 4 OpCos<br>- 4 states<br>- Gas and Electric, T & D | - 1 OpCo<br>-<br>Electric Only, T & D | - 2 OpCos<br>- 2 States<br>- Gas and Electric, T & D |
| | | | | | |
| Transformation Office | Capacity-Based | X | X | X | X |
| EAM / Scheduling / Mobility | Factor-Based | X | X | X | X |
| PowerPlan | NG Estimated | X | - | - | - |
| GIS | Factor-Based | X | - | - | - |
| Engineering, Design, Estimation, Mobility | Factor-Based | X | Process only | Process only | X |
| AIPM | Capacity-Based | X | - | X | X |
| Asset Analytics | Capacity-Based | X | X | X | X |
| Integrity Management | Capacity-Based | X | - | - | X |
| Integrated Resource Planning | Capacity-Based | X | X | - | X |
| Project and Program Management | Capacity-Based | X | X | - | - |
| Supply Chain | Capacity-Based | Process only | X | - | 'Lite" |
| Customer Experience | High-Level Comparison | X | - | - | - |
| Data Management | Capacity-Based | X | "Lite" | "Lite" | - |
| Legacy Remediation | Capacity-Based | X | X | X | X |
| IS Capabilities / Other | Capacity-Based | X | X | - | - |
| Business Enablement | Capacity-Based | X | X | X | X |
| Compliance / Technical Training | NG Estimated | X | - | - | - |
| | | **$458M** | **$330M** | **$158M** | **$211M** |

***Actuals for Utilities A, B, and C landed within acceptable success thresholds.***

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238 and 17-G-0239
Attachment 2 to DPS-431 AT-4
Page 1 of 3

Johnny Johnston
National Grid USA Service Company, Inc.
40 Sylvan Road
Waltham, MA 02465

February 22, 2017

**Re: Stage Gate Report with PwC Advisory findings/observations and high-level recommendations to inform the Stage Gate to move to the next phase of the project.**

## *Stage Gate Report*

Dear Johnny,

This report is intended to provide an overview of key findings and high-level recommendations based on review of the deliverables that have been completed by National Grid and Accenture during Phase I of the Gas Business Enablement program. In particular, this report focuses on the Future State Design and Scope and Roadmap for Gas Business Enablement

**Stage Gate Recommendation**

The GBE Strategic Assessment has been thorough in its approach and provides substantial reference material for the next Phase. It has effectively defined a comprehensive program scope which is well aligned to deliver the program outcomes and developed an appropriate cost estimate for the scope and transformative ambitions of the program.

We believe it would be advantageous to further optimize the roadmap tactics and efficiency of deployment of the current program scope as you progress through the next phase to allow for greater emphasis on user adoption and driving the benefits realization and targeted outcomes. We encourage National Grid to consider the recommendations provide below seriously.

**Our assessment is that the program is ready to move into the next stage.**

The sections below contain more detail on our findings and recommendations:

**Future-State Design**

<u>Key Findings</u>

- The solution design is based on industry leading software applications that can support National Grid's GBE Program objectives.
- The design conforms to industry standards to deliver a consistent solution, but can be further tailored to National Grid in specific areas. These areas include contractor management, contractor use of the system, materials handling and clear definition of the Customer Relationship Management solution component.
- There are numerous industry-leading customer experience aspirations that are documented within the requirements matrix that address simplicity and usability, but further definition is required on how CRM will serve as a wrapper for CIS to allow a single application for the CSRs.

- The design would benefit from a clearer and more systematic linkage of scope to initiatives (e.g. mapping of business processes, data objects, RICEFW/RAWICE Objects, operating model decisions, KDDs, applications to the program initiatives) and the precedence linking of the initiatives; this can be refined during the next phase and will help with governance decisions

- Impact to the business roles and responsibilities and overall Change Impact is also in early stages of development and is planned to be a focus in the next stages of the project.

Recommendations

- Minimization of customizations is critical to providing the agility to evolve the solution by upgrading with each new product release. This should be a guiding principle for the detailed design teams.
- Establish design governance processes to maintain tight controls on Requirements and Key Design Decisions.
- Conduct an early deep dive to drive out the details in contractor management, contractor use of the system and materials handling to streamline the detailed design effort.
- A similar deep dive concerning the Customer Relationship Management solution component should be conducted early in the detailed design. Particular attention should be devoted to how the Customer Relationship Management solution will serve as a wrapper for CIS allowing a single application for the CSRs.
- The future state for technology is evolving. Emphasis should be placed on the data flow, system of record/entry for key data objects and the overall integration model to ensure that data is synchronized and consistent and supports business processes and analysis for continuous improvement.
- Continue to socialize the solution with the business so they develop a clear vision and build a sense of ownership in decision making within their areas.

**Gas Business Enablement Scope and Roadmap**

Key Findings

- The proposed GBE roadmap work streams and initiatives provide a program scope well matched to achieve the targeted outcomes and objectives of GBE. The initiative scope goes beyond process and technology to address gaps across the full set of elements of the required core operational business capabilities.
- The 4.5 year deployment duration for the GBE scope elements in the roadmap work streams and initiative listing is achievable.
- When comparing the total costs of this transformation to other industry benchmarks, a business case estimate of >$500 million is appropriate to cover a transformation of this scale.
- The final version of the SI Work Package provides the level of information necessary for System Integrators to understand the full scope of the Gas Business Enablement program and to enable National Grid to compare equivalent bids.
- National Grid should consider increasing program focus on user adoption of new work practices and tools and resulting benefits realization. This is underserved in the current roadmap where activity typically stops after initial support periods for deployments of new applications and processes.
- We believe the deployment planning of the EAM/WM scope will benefit from further analysis to (a) understand the pros and cons of the proposed “work type” phased approach (which increases

technical complexity) compared to deployment of a core WM solution, and (b) evaluate the initial ramp up of resources and balance between core operational and supporting modules..

- National Grid should consider utilizing a "hybrid agile" deployment during deployment of the EAM/Work Management core. This means that user facing aspects of the solution are developed using a multi-cycle "agile approach" which aligns with the structure/timing of the design-build-test system development life-cycle (SDLC) required for the integration and data management components. Thus the accelerated deployment of core EAM-WM scope will bring forward the viable date for agile ongoing improvement of the core.
- Compliance with the elements of API RP 1173 for a Pipeline Safety Management System has been one of National Grid's requirements for Gas Business Enablement, however not all elements are as clearly linked to the proposed roadmap as they could be. While it is believed that most requirements are satisfied by the current GBE scope, several areas will need follow-up during implementation – including end-to-end materials traceability process, corrective action program and management of change.

Yours sincerely,

Chris Fynn, Principal

christopher.c.fynn@pwc.com
T: 1-646-284-6562

Johnny Johnston
Senior Vice President
Gas Business Enablement

Niagara Mohawk Power
Corporation
d/b/a National Grid
Case 17-E-0238 and 17-G-0239
Attachment 2 to DPS-431-AT-1

Chris Fynn, Principle
PricewaterhouseCoopers LLP
300 Madison Ave,
New York, NY 10017

March 1, 2017

**Re: Stage Gate Report**

Dear Chris

Thank you for Stage Gate Report on Gas Business Enablement dated February 22, 2017, and for the support that PWC provided to National Grid through the Strategic Assessment Phase of this important program of work for National Grid and our customers.

As you are aware a lot of work has gone into the first phase and we are pleased to see your overall assessment that the scope is well matched to the desired outcomes, the deployment appears achievable, and the costs are appropriate to cover a transformation of this scale; ultimately that the program is ready to move into the next phase.

I did want to highlight some of the actions that National Grid's is taking to address your findings and recommendations:

1. We have instigated a number of additional interim work items prior to the next phase that specifically will provide clearer and more systematic linkages of scope to initiatives including developing standardized L3 processes. This work has also more clearly defined our requirements around contractors and materials traceability. We are also doing an extended piece of work on data to better inform our thinking in this area.

2. We will be conducting a competitive collaborative/agile procurement process to source our future delivery partners for the next phase. We are planning to leverage this process to better understand potential solutions around the delivery of the customer capabilities that we have said that we need. We have also undertaken a separate customer strategy exercise that is helping better inform the best direction. Our procurement approach will also allow us to assess opportunities that suppliers might have to further optimize the roadmap.

3. Finally, National Grid intends to have overall control of the PMO through the delivery phase. We believe this will help address the various recommendations made around maintaining discipline and strong governance as we go through delivery. We will also be



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**Johnny Johnston**
Senior Vice President
Gas Business Enablement

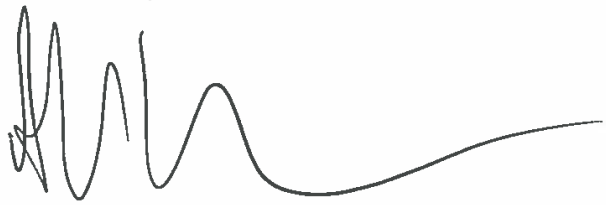
nationalgrid

looking to hire a Value Assurance partner that will provide independent assurance that we are continuing to focus on the right things to support a successful outcome.

I did want to follow up on one area of recommendations where perhaps you didn't have full visibility to all the work we have been doing; that was around Pipeline Safety Management and API 1173. This has been an area of focus for us since the beginning of the program. However we have been leading this work through Dan McNamara with support from a niche consulting firms P-Pic and Mosaic. This has been done in parallel with the Accenture work that PWC has been overseeing and so might be why you believed there were still some gaps. I can confirm materials traceability is part of our requirements and there is a significant piece of work looking at the management of change, particularly related to our policies and procedures. As we move into the next phase we will look to do a better job of articulating how this all comes together into a single roadmap that covers people, process, technology, training and governance to support the implementation of all the elements of API 1173 into National Grid as part of the Gas Enablement program.

Thank you again for the work of your team over the last year, I am excited to see this move into implementation and the difference that this program will make for our employees and customers.

Yours sincerely,



Johnny Johnston,
Senior Vice President, Gas Business Enablement

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Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238 and 17-G-0239
Attachment 4 to DPS-431 AT-4
Page 1 of 5

Inputs and Assumptions Used to Estimate Gas Business Enablement ("GBE") Program Costs

GBE Program Costs were developed utilizing bottom-up detail for all initiatives primarily along the (i) labor effort required (ii) software and hardware costs and (iii) labor rates. Detailed inputs and assumptions varied by the type of costs estimated for GBE initiatives as elaborated below. Importantly, costs were also estimated by scaling implementation costs from previous peer utility experiences with similar initiatives.

## A. Labor Effort

*iii. Legacy Integration Contractor Labor Rates*

Labor rates for the Application Maintenance vendor were developed by using the current rates paid to vendors who supply Application Maintenance services to the Company today. with a corresponding daily rate for onshore and offshore consultants escalated at 3% annually.

**B. Software & Hardware**

- Accenture Delivery Architectures - (ADA) model provides a blueprint for architectural design & decisions.
- National Grid Cyber Security Operating Model and Diagnostic to identify areas for significant improvement in security of GBE solutions.
- Accenture Analytics Information & Security Architecture to assess current state structured and unstructured data and link insights to value.
- High Performance Utility Model Architectures to link business process/functions / information and the underlying technologies.

- Accenture's Market Scan/POV to ensure alignment and linkage to reference architecture (high level requirements).
- Accenture Agile and DevOps (Transformation) - Capabilities (e.g. provisioning, continuous integration) that support Agile delivery and associated set of reference tools/ architecture.
- Accenture Delivery Methods and Estimators – To estimate the cost of initiatives and utilizing the appropriate Accenture Delivery Model estimators such as the Distributed Agile Development estimator.

**C. Specialty Consultants**

*ii. CxT Portal & Channel Management*

Estimates are based on:

- Full time National Grid business resources to deliver the business needs of program including communication, business decisions, change management.

- Full time IS resources to deliver the software in order to meet the business decisions and needs.

- Estimated cost of software, will continue to go through a formal procurement process in order to finalize the selection of the software and final costs.

*iii. Data Remediation: GIS Upgrade/ Migration & GIS Mobility*

Data Management includes the following efforts: profiling; cleansing; enriching; transforming; migrating; monitoring and reporting; archiving; and deleting activities. In addition, part of the data management program is to establish data operations processes that would manage the movement of data from the source application, cleaning the data, conversion of the data and preparing the data for loading into target system(s) and establish the data retention policies (Business, Regulatory, and Legal holds), data archiving policies, and the data deletion and destruction policies. Ultimately, the goal of the data management initiatives is to improve data accuracy and record-keeping.

The assumptions were derived from a qualitative assessment of the gas operations information systems landscape to provide a directional sense of complexity for the data management effort under GBE.

The total estimated cost for data management was based on a resource-driven model over a 48 month duration to delivery data efforts iteratively. The resource structure and size assumed 22 resources (split between external and National Grid resources) and were based off a similarly-sized West Coast utility operating in multiple jurisdictions. Considering the estimated program duration and the resource requirements, the number of days was derived based on the assumption of 18 productive days per month per person. The number of days estimated for each of the resource types was then multiplied by their respective external or National Grid average daily rates resulting in the estimated cost for each resource type to deliver the data management efforts.

*iv. Regulatory/Compliance*

Training estimates were developed using industry-standard ratios for how long it takes to develop one hour of training and applying those ratios across National Grid's desired future training catalogue. The ratios were an application of Chapman benchmarks adjusted based on Mosaic's experience in the industry. The Chapman benchmark data comes from a report the Chapman Alliance, a consulting organization for learning initiatives, published based on data from 250 organizations, including 4,000 learning development professionals, across a wide variety of industries. The report provides a range of ratios for how long it takes to develop one hour of training, factoring in a number of considerations including complexity of materials, audience, available materials, desired level of interactivity, etc. for both instructor led training ("ILT") and web based training ("WBT") materials.

Where existing materials appear to have some reusability, factors were applied to consider the efficiencies derived through re-use of existing material(s).

National Grid calculated the operating expense estimates for the Regulatory/Compliance initiative as follows:

Total Development Cost = Desired hours of curriculum* Estimated development time per hour of curriculum*Reusability factor * Standard hourly rate.

National Grid's existing portfolio was evaluated, and the following reusability estimates were used in the calculation above:

- Complete rebuild: 50% of portfolio (0% reusability)
- Significant rebuild: 25% of portfolio (25% reusability)
- Medium rebuild: 25% of portfolio (50% reusability)
- Conversion of ILT to WBT +/-1% of portfolio

Date of Request: June 28, 2017 Request No. DPS-433 AT-6
Due Date: July 10, 2017 NMPC Req. No. NM-1006

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, Andrew Timbrook

TO: National Grid, Gas Information Systems 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.

Concerning the proposed GBE program, provide the following:

1. Fully explain how the Company plans to deliver GBE on time and on budget. Include in your response a full explanation of how the current approach differs from the development and delivery of major Information Systems (IS) projects implemented previously.

2. Did the Company interview peers that have implemented major IT projects? If so, explain:
   a. The lessons learned from those discussions; and
   b. How the lessons validated, or were incorporated into, the plan.

3. Explain how the Company plans to train its employees to maximize productivity.

4. How will GBE impact the execution of the Capital plan in the Rate Year and Data Years?

5. Provide an assessment of how GBE relates to the overall IS program. Include in your response answers to the following questions:
   a. Does GBE rely on any IS programs for functionality, or can it function as a stand-alone project?
   b. Are there any duplicate budget items between GBE and the other IS projects?

c. Are any of the IS investments (other than GBE) required to achieve the full benefits of GBE? If yes, identify each such investment and explain why it is required.

Response:

1. To deliver the GBE Program on time and on budget, National Grid has (i) adopted various best practices in program governance and management; (ii) selected deployment strategies and development methodologies to manage risks and improve outcomes; (iii) is implementing a new approach to change management; and (iv) retaining a third party value assurance partner to evaluate program direction and deliverables.

   Program Governance and Management:

   After studying the lessons learned from past IS projects at National Grid as well as accepted industry best practices, National Grid developed a framework of eight Critical Success Factors (CSFs) to ensure the successful delivery of the GBE Program. The GBE Program has been closely adhering to these CSFs since the beginning of the program and continually checks itself against them. The CSFs are:

   *Active Sponsors* – Performance for the sponsor is linked to success of the project

   - The GBE Program Steering Group includes senior executives from National Grid US and National Grid plc. The Steering Group meets periodically with the Program Sponsor to exercise oversight, including on budget and timing, over the GBE Program and to provide guidance and access to resources as required.
   - A full time Program Sponsor has been appointed to lead the Program and ensure alignment and focus on strategic business priorities and outcomes.
   - The Program Sponsor and Leadership Team's success is directly tied to the achievement of the GBE Program as well as budget and timing.

   *Carefully Managed Scope* – Project scope is realistic and achievable

   - High level design workshops with participation from business subject matter experts and leadership were conducted. These served to focus the GBE Program scope on business need and opportunity, tightly aligned with the business case, and supported by the business itself.
   - Prior to the start of work, the GBE Program will roll out a comprehensive change control – including scope – process and educate all team members on their responsibilities in scope management process

*Clear Success Criteria* – Project outcomes are clear and compelling

- Clear ambitions have been set for this program – to reduce operational risk, improve operational performance and create a flexible platform for the future.
- The program team has defined business benefits anticipated as a result of GBE as detailed in Exhibit __ (GIOP-12).
- National Grid has developed a value framework to baseline, measure and track improvements in operational performance metrics as a result of GBE.

*Readied Business* – An informed, engaged business is ready to successfully implement the change.

- Change management and business engagement activities will occur continuously throughout the GBE Program's lifecycle and have been planned and resourced with the same rigor as the systems delivery work streams.
- Business resources will participate in all phases of the work including design, development, testing and deployment. This will facilitate smooth handover from the GBE Program team to the business user community.

*Rigorous Stage Gating* – Tightly defined criteria must be met for projects to move between stages.

- Stage gating is built into GBE Program plans and management frameworks.
- The GBE Program will use a scaled agile development methodology that is performance data driven and includes regular planning workshops to evaluate progress, quality, risk and outcomes achieved.

*Good Governance* – Established governance groups, supported to operate effectively.

- A comprehensive GBE Program Handbook has been developed including processes, tools, templates, roles and responsibilities. The Handbook supports integrated program planning, resource and finance management, scope control, risk and issues management, commercial management, quality assurance, performance management and governance support.
- The GBE Program engages independent reviewers to provide feedback on deliverable quality, process compliance, alignment to business case and strategic business objectives and priorities.

*Well Managed Partners* – The right partners/resources fit for the GBE Program, held accountable to deliver.

- A rigorous sourcing process is underway to retain highly capable consulting partners at competitive rates.
- Service levels and incentives are tied to achievement of the National Grid business benefit case and captured in contracts.
- Contracts with experienced delivery partners are being established, it is expected that these will be on a fixed price basis, supported by rigorous oversight and change control processes.
- The GBE Portfolio Office has established the capability to manage all program consulting and service contracts.

*High Performing Teams* – One team, the right people, highly motivated.

- The GBE Program is competitively recruiting all team members for the right mix of capabilities, skills and experience, as well as alignment with National Grid and GBE values and culture.
- Program "ways of working" are designed to foster a "badge-less, one team" culture between employees and consultants.

Attachment 1 provides a further description of the CSFs.

Deployment Strategies and Development Methodologies

The GBE Program differs from previous major implementation in that it is placing greater emphasis on upfront and continuous business engagement and alignment and has invested significant effort in ensuring that the scope and road map are aligned and supportable. This supports on time, on budget delivery by reducing unplanned scope change, facilitating timely business resource availability and handover of GBE solutions. Different from previous programs, the performance of both GBE consulting partners and the National Grid team is directly measured by success in realizing the business case. Additionally, in the past, some programs and projects did not sufficiently enable their governance and management organizations to support the size and complexity of the efforts they were supporting. National Grid is deploying a governance structure that is appropriate to the size, scale and impact of the GBE Program. The GBE Program management organization is enabled with the resources, tools and capabilities necessary to support on time, on budget delivery of the program scope of work.

To lower overall costs, reduce and manage delivery risks and accelerate the time between kick-off and deployment of functionality and capabilities to the user community, the GBE Program will deploy multiple work streams working concurrently and delivering in a phased approach based on geography and work type. Further, the program will adopt an agile deployment method based on SAFe (Scaled Agile Framework) that supports

quicker development of initial functionality, routinely engaging the user community throughout, and providing an approach to prioritizing and delivering enhancements. The GBE Program will also leverage cloud-based industry standard solutions to support faster deployments, provide greater scalability and security, and reduce legacy infrastructure upgrades and risk of obsolescence.

Change Management

A key learning from National Grid's past experience and from discussions with peer companies is that change management must be a core program capability and must be active throughout the entire program lifecycle. Additionally, all levels of the organization must be engaged through a managed plan including communications and activities that maintain a strong link between the user community and the GBE Program. The GBE Program's phased deployment strategy breaks the level of change that users will experience into more manageable increments and reduces the likelihood of process disruptions and delays as the various phases of the program are implemented.

In some previous programs, change management tended to be regarded as more of a "back end" activity performed by a select group of change specialists focused more on educating users on solutions they were receiving rather than engaging them in the actual process of developing the solution. Additionally, business engagement tended to be more episodic and focused primarily on the employees who would be directly using the solution. The GBE Program treats change management as an essential capability and key enabler of successful program delivery. Change management activities occur continuously throughout the program lifecycle, are supported by the entire program team, and engage not only the US gas business leaders and employees but also stakeholders within the Jurisdictional teams, support organizations such as Supply Chain and Information Services, as well as other parts of the US Business.

Third Party Value Assurance

The GBE Program is planning on procuring a third party "Value Assurance" partner. Their role will be to provide ongoing independent assessment of program delivery to either provide confidence the program is on track or early warning of any changes needed to secure the desired outcomes. The Value Assurance partner will report directly to the Program Sponsor and Steering Group on their findings.

2. Attachment 2 describes the interviews with peers on similarly complex projects.

3. GBE will provide comprehensive training to all users of the system, including office and field employees at all levels in the organization. Training will be tailored to the type of employee (*e.g.*, manager, service technician) based on the level of detail required by that type of employee. Training design will be a collaborative effort between a dedicated GBE training team and the business to ensure that the training is appropriately targeted and minimizes the disruption to business operations. The training will be delivered through various media such as computer based training, video, and classroom. In addition to pre-

deployment training, procedures, help guides, and strategically located subject matter experts will be available following deployment.

In addition to system training, managers at all levels will be trained in change leadership beginning in October 2017. As the program progresses, leaders will be formally coached on how to lead their teams through system implementation. This approach has been shown by change experts to effectively prepare teams for the upcoming changes and minimize productivity issues. Work on the training plan and materials will commence shortly, and the initial materials will be developed over the next 3–4 months.

GBE will also be implementing a tailored approach to engage, upskill and enhance capability of the field force and front-line management to change behaviors, remove obstacles and enable change with respect to serving and interacting with customers. The timing of this training will follow the established release schedule.

4. Implementation of the GBE Program roadmap and initiatives is not expected to adversely impact delivery of the capital plan in the Rate or Data Years.

   The GBE Program initiatives will deploy capabilities to support capital plan execution in the following areas:

   - Deployment of a graphic work design tool and compatible unit estimating to improve the accuracy of project estimates to actual performance enabling improved planning of work and associated resources;
   - Enterprise Asset Management system deployment along with new methodology and mobile tools for employee time capture, equipment assignment, and materials allocations by project with greater traceability for installed assets. Further, enhanced ability for contractors to submit invoices electronically against CU estimates with enhanced reporting capability will improve in-year budget forecasting as a result of greater transparency and accuracy with project spending.
   - Increased estimate accuracy and forecasting will support capital planning activities
   - Development and deployment of asset integrity management tools to support the selection and prioritization of mains as part of proactive replacement programs

   As detailed in Exhibit __ (GIOP-9), the following GBE initiatives with in-service dates by the Rate and Data Years specifically support the execution of the capital plan:

   - CU Governance & Library – process (in-service November 2018)
   - Asset Investment Planning and Management (“AIPM”) Tool – Enhancements (in-service December 2018)
   - Additional Integrity Management (“IM”) Modules (in-service February 2019)
   - EAM-FIN Integration (in-service June 2019)
   - PowerPlan Integration & Enhancements (in-service June 2020)
   - Design (GWD), Estimating (CU), & Mobility (in-service September 2020)
   - Construction Work & Leak Repair (in-service September 2020)
   - Asset Analytics Integration (in-service December 2020)

- GIS (GWD/CU) – Project Portfolio Management ("PPM") Integration (in-service December 2020)
- GIS-EAM Integration (in-service December 2020)
- Complex Design (CAD) & Estimating (ESW) (in-service March 2021)
- Use Case No.1 - Asset Risk (in-service March 2021)

5.

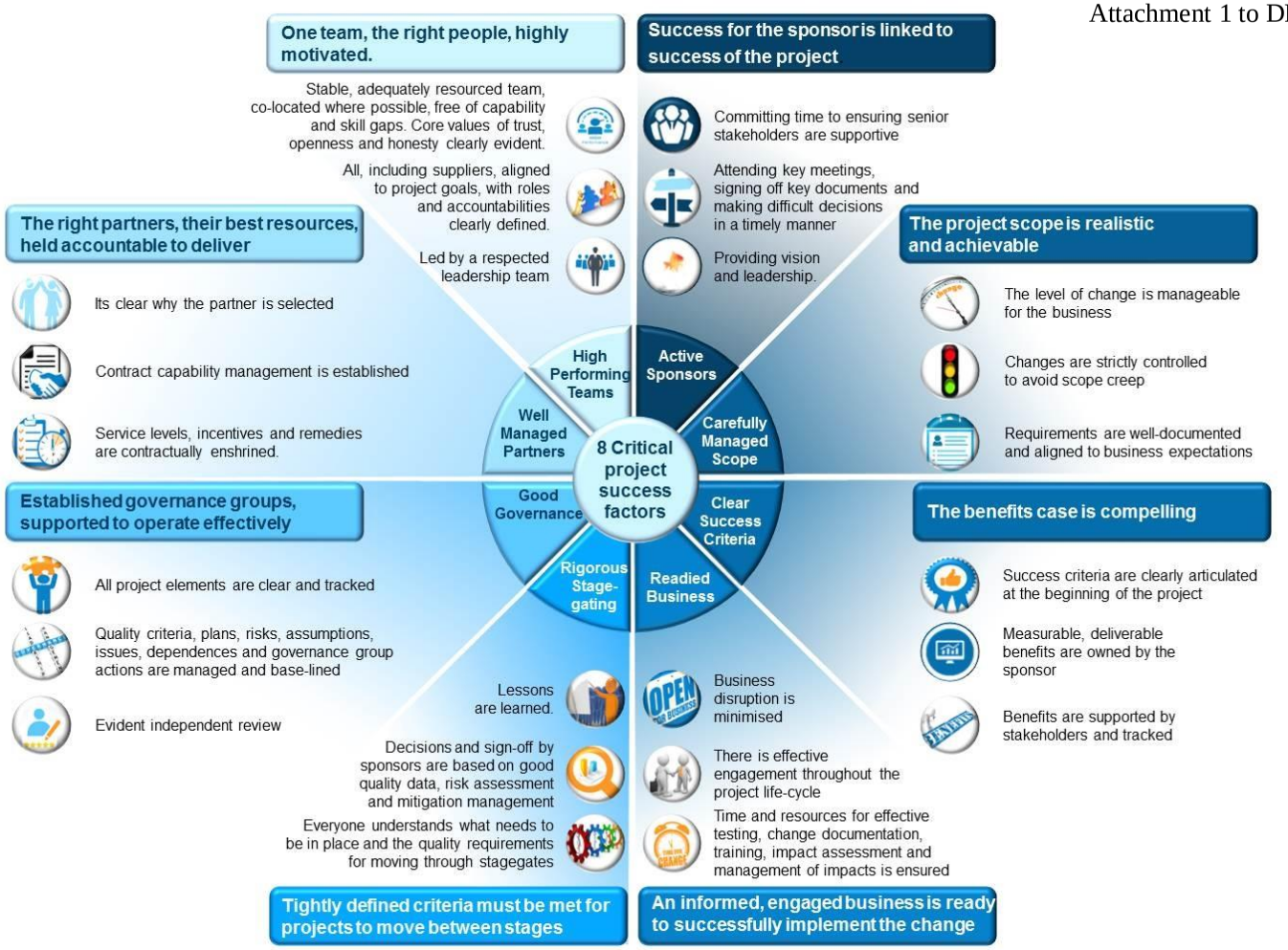
a) The GBE Program implements a suite of work and asset management systems that will assist in managing the Company's gas business. Besides feeding other systems such as the financial and asset register systems, the GBE Program does not rely on other IS programs for functionality. Please note that Attachment 1 to DPS-278 (IS-7) described certain Technology Modernization investments (RAS/VPN Re-Platform/Mobile, US Network Programme, ICE Replacement, US VSTIG Programme, US Wireless Programme) as technical changes, network upgrades, and wireless capabilities that can be leveraged for the GBE program; however, these investments are not specific requirements of the GBE Program but rather function to facilitate the future implementation of any new systems required by the business such as GBE and NY REV/grid modernization.

b) Beginning late last year, the GBE team conducted a review of all projects in the IS portfolio to determine if any IS projects overlapped with GBE initiatives. That review occurs on an ongoing basis to determine if any new projects that are proposed impact GBE. No duplicate budget items between GBE and other IS projects have been identified.

c) No other IS investments are required to achieve the full benefits of GBE.

Name of Respondent:
Christopher Murphy
John Stavrakas

Date of Reply:
July 10, 2017



The National Grid Gas Business Enablement (GBE) team conferred with three peer utility companies to gain insight and lessons learned from their experiences implementing similarly complex IT projects.

These lessons learned have informed the GBE Program's development of strategy, delivery approach and methods as well as governance and management frameworks. Lessons learned and how they validated, or were incorporated into, the GBE plan are shown below.

| Company | Key Lessons Learned | Impact |
|---|---|---|
| **<u>One Gas</u>**<br>• 2.1M Customers over 3 states<br>• 5 Year Maximo, CGI and Copperleaf Implementation | • Take a phased approach to implementation and use pilots<br>• "Grow your own talent" by hiring new college graduates and letting them learn the solution from the ground up. They bring new and fresh perspectives<br>• When working with legacy data, be careful about its quality. It can unfavorably skew analysis results<br>• Make sure you have thought through, designed and built your initial Day 1 reporting<br>• Don't assume that sending messages to VP's will result in trickle down through the organization. Your change program should directly engage the impacted users<br>• Get your change program established right up front | • The GBE roadmap is built around the concept of phased deployment of functionality and solutions with the first release serving as a pilot. Once that release is stable, functionality is progressively deployed over time<br>• The GBE team is recruiting team members both internally and externally – based on "best fit" for the capabilities required. External hires include qualified new college graduates who are learning the solution at a fundamental level while adding value through personal capabilities, skills and perspectives.<br>• GBE stood up a data management team at the outset of the program to evaluate legacy data quality and provide input to program plans, estimates and scope<br>• GBE has adopted an end to end process approach that captures process and reporting requirements<br>• GBE has developed a governance model and communication approach that engages leadership and users at all levels<br>• Change Management has been established as a core program capability and has been actively engaged throughout |
| **<u>ATMOS Energy</u>**<br>• 3M Gas Customers across 8 states<br>• 3 Year SAP, Click, Scylo implementation | • CEO set the tone for a culture of change management and employee engagement and common values to insure alignment between business and program<br>• Formed a process council of business leaders that were accountable for key process design decisions to support ownership and buy-in<br>• Addressed data cleansing from the | • US Gas Business Leadership has visibly demonstrated support of the GBE program and have actively participated in a series of events designed to engage employees at all levels and foster alignment between program and business<br>• A Design Authority consisting of the leaders of US gas business units and key supporting functions was formed to directly engage the business in key process |

| Company | Key Lessons Learned | Impact |
|---|---|---|
| | beginning of the program and continuously throughout<br>• Focused program scope on key processes rather than trying to fix everything at once | design decisions and to provide input on program scoping, planning and delivery activities<br>• Data cleansing activities occur throughout the program lifecycle. Program governance and management activities insure these activities are appropriately prioritized, monitored and resourced<br>• The GBE Program conducted a Strategic Assessment activity to define scope, business case and roadmap that aligned to business and strategic priorities |
| **DTE Energy**<br>• 1.1M Gas customers<br>• Implemented Maximo, CGI, and SAP in 2007 | • Training needs to include the business process, not just how to operate a screen. Users need to be taught how to do their job in the new solution<br>• At the very beginning of the program, focus on getting data hierarchies correct – they are very expensive to change later<br>• Engaged unions early and regularly, used a quarterly "pulse check" to understand how people are feeling<br>• Developed a strong performance management cadence including daily stand-up/Hub meeting, weekly performance calls etc. | • The GBE Program will incorporate the process / job orientation into training protocols and development standards<br>• The GBE Integrated Program Plan will support alignment of the Data Management Team with Work Streams and Projects within the GBE Program to insure that hierarchies are developed in a timely and complete manner<br>• GBE business engagement plans include union specific activities. An employee engagement evaluation process will be deployed- similar to a "Pulse Check"<br>• The GBE Program participates in the US Gas Business performance cadence to further support business/program alignment. The GBE Program has a regular cadence of "Hub" and performance oriented meetings which will be expended as appropriate during mobilization. Tools and processes are being deployed to support a dynamic approach to program and project management |

Date of Request: June 28, 2017 Request No. DPS-432 AT-5
Due Date: July 10, 2017 NMPC Req. No. NM-1005

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, Andrew Timbrook

TO: National Grid, Gas Information Systems Panel

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

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.

Concerning the proposed GBE program, provide the following:

1. A graphic showing the current NMPC programs and the average age of those programs. Does the age of NMPC's systems drive the need for GBE?

2. Explain how crews currently acquire new or revised procedures.

3. Explain how GBE will change the process by which crews acquire new or revised procedures.

4. Explain how customers currently make appointments.

5. Explain how GBE will change the process by which customers make appointments.

6. Explain how customers currently acquire information from the Company.

7. Explain GBE will change the process by which customers acquire information from the Company.

Form 103

8. Explain why the Company plans to roll out (program) at its Rhode Island gas distribution company first.

9. Explain how the Company engaged stakeholders when it developed the GBE business plan.

10. Did the Company conduct any Pilot programs associated with GBE? If so, identify each Pilot program, describe its results, identify lessons learned from each Pilot program, and explain how those lessons were incorporated into the GBE plan.

11. Page 88 of the Panel's Pre-Filed Direct Testimony states that "it is becoming increasingly difficult to support safe, compliant, operations and meet regulatory obligations."

a. Identify the areas where the Company was either unsafe, non-compliant, or did not meet regulatory obligations.

b. Explain how specific components of GBE will improve each of the issues identified in response to the preceding question.

Response:

1. Attachment 1 depicts the current state of applications that support functions required by Niagara Mohawk's gas business, as well as the projected future state of the same functions after GBE implementation. The average age of the systems supporting Niagara Mohawk's gas business is eleven years.

   The age of the systems supporting Niagara Mohawk is an important driver of GBE. These systems are quite old, and in many cases are no longer supported by the vendor. This creates an unacceptable risk to gas business operations and Niagara Mohawk's ability to effectively serve customers. As systems age, and technology changes, it is increasingly difficult to make modifications to the systems to support changing business requirements. In addition, the current systems, many of which rely on paper records, no longer support the way today's gas businesses need to operate, manage performance, and provide employees with the right information and effective tools. Modern supported solutions are also needed to help reliably deliver capital investment and growth.

2. Currently, crews utilize two methods of acquiring new or revised procedures. In some locations, paper procedure manuals are produced and distributed to field workers. In areas where field workers have access to the Company InfoNet, a link to an automated procedure library provides access to the procedures in a truck-mounted computer.

3. Following GBE implementation, all field workers will have access to modern mobile devices, and will be able to access a procedure portal online. Importantly, this will enable workers to access procedures in the field where the work is being performed. There are also plans to make learning libraries available online for common procedures, tasks and repairs, and these may include photographs and short training videos.

4. To make a service appointment today, a customer must contact the call center and speak to a customer representative. The customer representative, while speaking with the customer, accesses a system function that shows appointment availability. Appointment availability is based on the average number of jobs per day per field worker, the season, day of the week, time of day, etc.

5. Following GBE implementation, in addition to contacting the call center, the customer will also have the option of using the web to make the appointment, and will be presented with a screen with the available appointment windows. The customer will also have the option of receiving a call or a text when the field worker leaves for the appointment.

6. A great deal of information is available on the Company's website. However, if a customer has a specific question about billing, equipment, pending work, etc., the customer must contact the call center and speak to a customer representative. While speaking with the customer, the representative is presented with a number of screens to research the customer's question. Today, however, much information, such as that related to construction or maintenance work and new service requests, is not available to the customer representative, and it is often necessary to refer the customer to other Company departments, or request that the customer submit the request in writing.

7. Following GBE implementation, the customer will be given the opportunity to use the Company's website on a much broader scale to obtain information from the Company. In addition, the customer will have many more self-service options through digital channels to enable them to choose how they interact with National Grid. The customer will be able to access screens that were previously available only to customer representatives, and that will guide the customer through the website to the answers they require. Customers will be able to request further information online, and will be able to upload documents and photographs to support their questions. The integration of the new systems that are part of GBE will make much more information directly available to customers, without the need to work through a customer representative.

   For customers calling the call center, the process will also be enhanced by providing customer representatives with much more information to better serve customers.

8. Please see the Pre-Filed testimony of the GIOP Panel, page 95, lines 1 – 7.

9. Development of the GBE business case required detailed analysis of the current gas processes, including functions that were particularly difficult to perform, given the aging systems that supported those processes. Significant analysis was also required to identify what the new processes would be needed to support the gas business now and into the future. Stakeholders for these activities included subject matter experts from throughout the gas business, and included management personnel and field workers from across all gas business functions and regions. It is important to note that the GBE project team itself was staffed with individuals with direct experience across the gas business. The GBE Program conducted 44 workshops with over 400 employees at all levels across 44 departments in the gas business to collaborate on systems and process pain points, system

design and functionality, and processes that could better serve customers. Workers from the Contact Center, Dispatch, Meter Work, Maintenance, Construction, Asset Management, and GIS, among other groups, participated in these sessions. The GBE team engaged the much larger Operations teams by travelling to each jurisdiction and various groups within those jurisdictions to discuss pain points, and the Operations driven proposals. Support departments such as Supply Chain and Human Resources have also been kept fully aware of the direction of GBE, and have participated in the workshops as appropriate. The workshops formed the basis for development of the roadmap, comparing the "as is" processes to the "to be" processes. Approximately fifteen team members continue to ride weekly with field workers and supervisors to better understand the pain points and incorporate recommendations. As the solution is being designed, each capability is being designed with the leads described above and with the Operations subject matter experts. Testing and training will also be conducted using the same teams.

Stakeholder outreach was also conducted with unions in Fall 2016. Union meetings are continuing for the next few weeks to provide status updates and also respond to any questions.

10. The GBE Program conducted two main pilots in 2016 to test important concepts that National Grid is planning to leverage through GBE to determine if they were viable. The first was a process pilot, the second involved two technology pilots. Four Meter-To-Cash processes were chosen for the pilots: Collections, Advanced Consumption, Stopped Meter, and Long Term Estimates.

    The process pilot was focused on feasibility of standardizing processes across the National Grid's various jurisdictions, recognizing the need to meet any regulatory requirements in each jurisdiction. The pilot involved workshops in all jurisdictions to understand current processes and to achieve broad engagement to define the "to be" process. The pilot was a significant success with four new "to be" processes being developed that were able to account for regional variations. By removing duplication across the jurisdictions, the total number of process steps from "as is" to "to be" was reduced by 56%, providing a good example of the potential for simplification.

    The goal of the technology pilots was to demonstrate that one of the new standard processes could be effectively implemented using Agile development methods. There were two technology pilots, one on Collections that was piloted in the field and one using the Stopped Meter process that was used as a back office demonstration. The pilots were successful in demonstrating that the Agile development methods were very effective, and were also very well received by management and field workers from the gas business.

    The Collections pilot was based in Long Island. It took less than 12 weeks from the start of the pilot to use of the solution in the field. It was also possible to see feedback from front-line employees built into the solution through the pilot process. The pilot introduced a modern technology device and user interface to the workforce, which were very favorably received.

The Stopped Meter pilot was based in Syracuse. It provided greater visibility into the process and activity status across all parts of the business was achieved. This was a desktop pilot but was able to show some of the opportunities a modern platform would provide the Company to more effectively manage work.

The technology pilots confirmed the benefit of using the Agile development methodology, which involved frequent engagement with business and field workers, and resulted in accelerated delivery of business value. The Agile methodology was well received by all participants in the pilots.

The results of the process and technology pilots were key inputs that validated assumptions around the approach to the GBE Program. The learnings were fully incorporated into the roadmap, including the ambition to consolidate processes across regions before developing the solution, leveraging the Agile methodology where practical, and utilizing cloud computing technologies.

11. In the testimony of the GIOP Panel, the Company states that the age of the systems supporting the gas business limits the ability to make modifications and increases the amount of time the systems are down. These systems limitations present challenges in supporting safety, compliance, and regulatory obligations. The Company did not state, however, that it is unable to support safe, compliant operations or meet regulatory obligations.

    The Company takes its gas safety and compliance obligations very seriously and has a broad range of systems and controls currently in place to deliver its obligations. However, there are certain areas where the current systems are preventing the Company from achieving its desired level of performance:

    *Missing or being late for a required work activity.* Today, this often requires additional manual controls and local tracking, follow up, and checking. Post GBE, all work will be contained in one system with pre-defined rules that will automatically schedule work in advance of its due date, and there will be central visibility to ensure all mandated activities are completed in a timely fashion.

    *Documenting work activity.* Many work activities involve paper documentation or filling out open text fields in truck-based computers. While the Company has implemented additional controls, including re-trainings, review meetings with crews, and modifications across multiple systems to enhancing tracking of these activities, post GBE employees will have devices that they can take to the job site, which will allow for paper forms to be replaced with electronic ones. Workers will have real-time access to the procedures for the work they are doing, as well as additional relevant training materials and electronic forms, which will validate required fields to support the accurate capture of the right information the first time. This information will be electronically stored to enable future access and reporting as appropriate.

*Completing, and following up on, warning tags*. Today, these are manual processes with manual controls such as backup personnel and additional human review. Post GBE, warning tags will be completed electronically and printed in the field – this will enable validation of information as the tag is completed, and it will give the Company an electronic copy of every warning tag. It will also enable any follow up work to be automatically scheduled, significantly reducing the reliance on manual processes and controls.

Beyond these specific examples, GBE initiatives are anticipated to provide various capabilities that will further support the Company's approach to gas pipeline safety and compliance, including customer engagement capabilities that will facilitate making appointments with customers,, reducing the number of jobs that are unable to be completed due to access issues. The GBE Program will also facilitate having CMS and Field Operations employees working on the same system – making it easier to transfer work between teams. The mobile platform will also make it easier to take pictures of abnormal conditions in the field and transfer them to the appropriate person/team so they can be more quickly assessed to identify any corrective action required. In short, the modern platforms to be delivered through GBE will enable Niagara Mohawk to move from mainly manual controls to more automated controls and give the Company great flexibility and agility to meet future requirements to continuously improve the approach to gas pipeline safety and compliance.

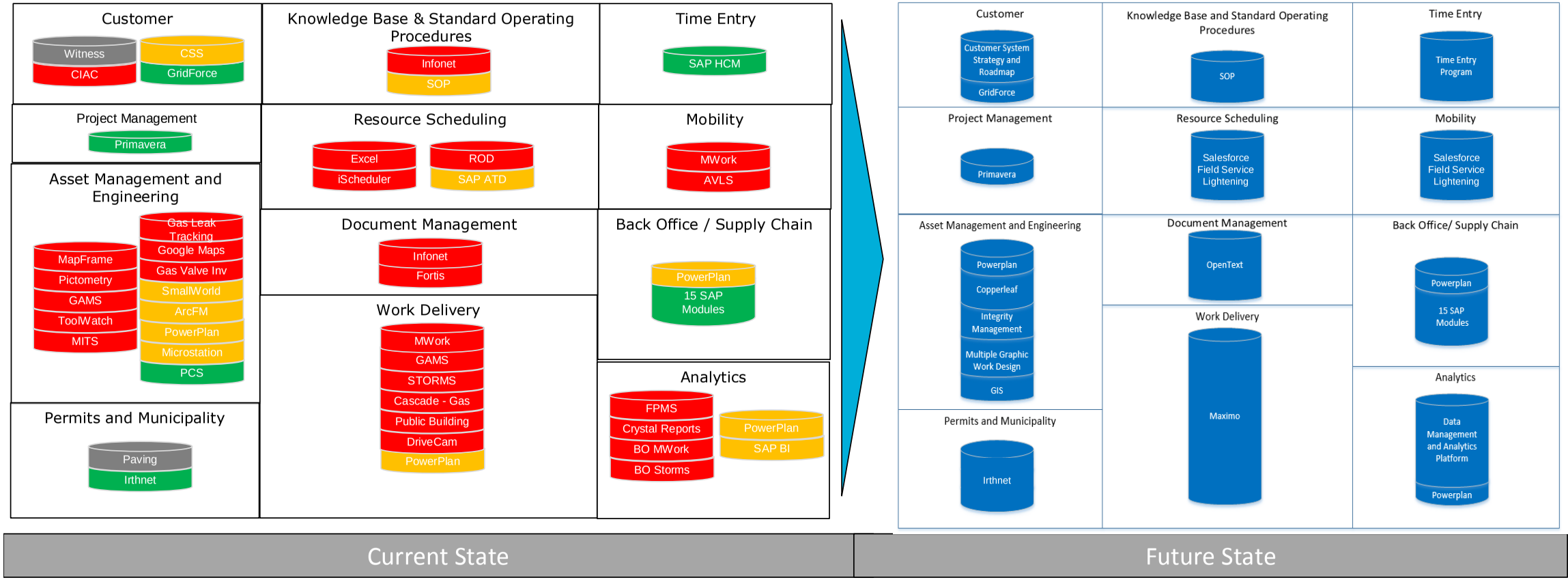
Name of Respondent:
Johnny Johnston

Date of Reply:
July 10, 2017

nationalgrid



# Current to Future State – Upstate NY




Current Disposition Risk (Technology/Business)

Unknown — Acceptable → Unacceptable

- Moving from ~50* to ~19** different systems across multiple functional areas
- Simplifying Integration across Asset & Engineering and Work Management Systems

Future State

*Multiple Modules/ Technologies / Instances not depicted due to multiple or incomplete mappings 36/59
**The Variability of 19 is due to Customer Experience not being a part of US GBE.

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) | ement | 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 Manag | 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

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: 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) | | | 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 | | |
|---|---|---|---|---|---|---|
| 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 | |
| | 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 | | | 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-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

Niagara Mohawk Power Corporation
d/b/a National Grid
Case No. 17-E-0238 and 17-G-0239
Attachment 1 to DPS-669-ATT4
Page 1 of 1

| 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 | | | G210 | 12/1/20 | 120 | - | - | - | - | 1,764,202 | - | 1,764,202 | - | $1,764,202 |
| Business Architecture - Organization Design & Transition | GBE- Business Enablement | | | G210 | | | - | 2,536,988 | - | 152,787 | - | - | - | 2,689,695 | $2,689,695 |
| | | | | G210 | | | - | - | - | - | - | 38,522 | - | 38,522 | $38,522 |
| Channel Analytics | GBE- Customer Engagement | | | G210 | | | - | - | - | - | - | 78,455 | - | 78,455 | $78,455 |
| Complex Design (CAD) & Estimating (ESW) | GBE- Asset Management | | | G210 | 3/1/21 | 120 | - | - | - | - | 2,389,087 | 154,343 | 2,389,087 | 154,343 | $2,543,430 |
| Construction Planning | GBE- Supply Chain | | | G210 | | | - | - | - | 806,766 | - | - | - | 806,766 | $806,766 |
| Core Projects & Program Management | GBE- Work Management | | | G210 | 6/1/21 | 120 | - | - | - | - | 3,134,061 | 348,229 | 3,134,061 | 348,229 | $3,482,290 |
| CRM / Contact Center | GBE- Customer Engagement | | | G210 | 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 | | | G210 | | | - | - | - | - | - | - | - | - | $0 |
| Customer Experience Program Leadership - 1 | GBE- Customer Engagement | | | G210 | 3/1/19 | 120 | 260,229 | 780,687 | - | - | - | - | 260,229 | 780,687 | $1,040,916 |
| Customer Experience Program Leadership - 2 | GBE- Customer Engagement | | | G210 | 3/1/20 | 120 | - | - | 266,277 | 798,831 | - | - | 266,277 | 798,831 | $1,065,108 |
| Customer Experience Program Leadership - 3 | GBE- Customer Engagement | | | G210 | 3/1/21 | 120 | - | - | - | - | 203,177 | 609,513 | 203,177 | 609,513 | $812,690 |
| Customer Interaction - First Release | GBE- Customer Engagement | | | G210 | 10/1/19 | 120 | 1,780,471 | 913,709 | 3,016,074 | 158,741 | - | - | 4,796,546 | 252,450 | $5,048,995 |
| Customer Interaction - Second Release | GBE- Customer Engagement | | | G210 | 1/1/21 | 120 | - | - | - | - | 2,010,254 | 105,803 | 2,010,254 | 105,803 | $2,116,057 |
| CxT Portal & Channel Management | GBE- Customer Engagement | | | G210 | 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 | | | G210 | | | - | 543,101 | - | - | - | - | - | 543,101 | $543,101 |
| Defined Data Cleansing Approach | GBE- Supply Chain | | | G210 | | | - | 362,067 | - | - | - | - | - | 362,067 | $362,067 |
| Design & Estimating Process Stabilization | GBE- Asset Management | | | | | | | | | | | | - | - | $0 |
| Design (GWD), Estimating (CU), & Mobility | GBE- Asset Management | | | G210 | 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 | | | G210 | 6/1/19 | 120 | 979,407 | - | 798,695 | - | - | - | 1,778,102 | - | $1,778,102 |
| Employee Support Interaction - First Release | GBE- Customer Engagement | | | G210 | 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 | | | G210 | 7/1/20 | 120 | - | - | - | - | 292,791 | 15,410 | 292,791 | 15,410 | $308,201 |
| Enhancements | GBE- Asset Management | | | G210 | 12/1/18 | 120 | 600,945 | 31,629 | - | - | - | - | 600,945 | 31,629 | $632,574 |
| Future State Culture Definition | GBE- Business Enablement | | | G210 | | | - | - | - | - | - | - | - | - | $0 |
| GIS (GWD/CU) - PPM Integration | GBE- Asset Management | | | G210 | 12/1/20 | 120 | - | - | - | - | 844,849 | - | 844,849 | - | $844,849 |
| Integrated Supply Feasibility Assessment | GBE- Supply Chain | | | G210 | | | - | 260,211 | - | - | - | - | - | 260,211 | $260,211 |
| Inventory Optimization | GBE- Supply Chain | | | G210 | | | - | 677,174 | - | - | - | - | - | 677,174 | $677,174 |
| Inventory Strategy | GBE- Supply Chain | | | G210 | | | - | 406,304 | - | - | - | - | - | 406,304 | $406,304 |
| Knowledge Transition & Collaboration Strategy | GBE- Business Enablement | | | G210 | | | - | 613,243 | - | - | - | - | - | 613,243 | $613,243 |
| Labor Contract Strategy & Implementation Support | GBE- Business Enablement | | | G210 | | | - | 76,353 | - | 78,455 | - | 80,616 | - | 235,424 | $235,424 |
| Large Commercial & Landlord Interaction | GBE- Customer Engagement | | | G210 | 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 | | | G210 | | | - | 1,566,624 | - | 169,949 | - | - | - | 1,736,574 | $1,736,574 |
| Maintenance & Inspection Planning | GBE- Supply Chain | | | G210 | | | - | 788,068 | - | - | - | - | - | 788,068 | $788,068 |
| Networking Transportation & Optimization Analysis | GBE- Supply Chain | | | G210 | | | - | 1,083,478 | - | - | - | - | - | 1,083,478 | $1,083,478 |
| Networking Transportation & Optimization Implementation | GBE- Supply Chain | | | G210 | | | - | 1,083,478 | - | - | - | - | - | 1,083,478 | $1,083,478 |
| Operations Performance, Governance & Value Realization | GBE- Business Enablement | | | G210 | | | - | 1,022,926 | - | 227,732 | - | 173,348 | - | 1,424,006 | $1,424,006 |
| Program and Project Management Planning | GBE- Supply Chain | | | G210 | | | - | 788,068 | - | - | - | - | - | 788,068 | $788,068 |
| Program Business Readiness | GBE- Business Enablement | | | G210 | | | - | 1,232,927 | - | 1,126,682 | - | 464,574 | - | 2,824,183 | $2,824,183 |
| Program Business Sustainment - 1 | GBE- Business Enablement | | | G210 | 3/1/19 | 120 | 69,617 | 208,850 | - | - | - | - | 69,617 | 208,850 | $278,467 |
| Program Business Sustainment - 2 | GBE- Business Enablement | | | G210 | 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 | | | G210 | 3/1/18 | 120 | - | - | - | - | - | - | - | - | $0 |
| Program Learning Management - 2 | GBE- Business Enablement | | | G210 | 3/1/19 | 120 | 130,211 | 390,632 | - | - | - | - | 130,211 | 390,632 | $520,843 |
| Program Learning Management - 3 | GBE- Business Enablement | | | G210 | 3/1/20 | 120 | - | - | 173,060 | 519,181 | - | - | 173,060 | 519,181 | $692,241 |
| Program Learning Management - 4 | GBE- Business Enablement | | | G210 | 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 | | | G210 | 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 | | | G210 | 3/1/18 | 120 | - | - | - | - | - | - | - | - | $0 |
| Program Transformational Change Office - 3 | GBE- Business Enablement | | | G210 | 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 | | | G210 | 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 | | | G210 | 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 | | | G210 | 3/1/18 | 120 | - | - | - | - | - | - | - | - | $0 |
| SAP and Application Integration Development- Release 1-2 | GBE- Information Services Enabling | | | G210 | 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 | | | G210 | 3/1/20 | 120 | - | - | 600,000 | - | - | - | 600,000 | - | $600,000 |
| SAP and Application Integration Development- Release 1-4 | GBE- Information Services Enabling | | | G210 | 3/1/21 | 120 | - | - | - | - | 600,000 | - | 600,000 | - | $600,000 |
| SAP and Application Integration Development- Release 2-1 | GBE- Information Services Enabling | | | G210 | 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 | | | G210 | 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 | | | G210 | 3/1/20 | 120 | - | - | 85,915 | - | - | - | 85,915 | - | $85,915 |
| SAP and Application Integration Development- Release 3-2 | GBE- Information Services Enabling | | | G210 | 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 | | | G210 | | | - | 445,855 | - | - | - | - | - | 445,855 | $445,855 |
| Skills/ Capability Assessment & Curriculum Redesign | GBE- Business Enablement | | | G210 | | | - | 556,933 | - | 171,590 | - | - | - | 728,523 | $728,523 |
| Supply Chain Program Leadership | GBE- Supply Chain | | | G210 | 3/1/19 | 120 | 565,045 | 1,695,136 | - | - | - | - | 565,045 | 1,695,136 | $2,260,181 |
| Supply Chain Program Leadership | GBE- Supply Chain | | | G210 | 3/1/20 | 120 | - | - | 235,258 | 705,773 | - | - | 235,258 | 705,773 | $941,031 |
| Use Case No.1 - Asset Risk | GBE- Asset Management | | | G210 | 3/1/21 | 120 | - | - | - | - | 3,591,031 | 189,002 | 3,591,031 | 189,002 | $3,780,033 |
| Warehousing Optimization | GBE- Supply Chain | | | G210 | | | - | 406,304 | - | - | - | - | - | 406,304 | $406,304 |
| WMFE Optimization | GBE- Work Management | | | G210 | 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 | | | G210 | 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 | | | G210 | | | - | 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 | $46,502 | $29,056 | $27,049 | $100,607 |
| OPEX | $31,626 | $14,523 | $5,699 | $51,848 |
| Total | $76,128 | $43,579 | $32,747 | $152,455 |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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.<br>Monetize asset risk in the form of amount of asset risk units mitigated per dollar of asset investment<br>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<br>Integrate with FIN to obtain actual project cost (as constructed). This shall inform deferral/accelerate decisions of future work in the Annual Work Plan.<br>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.<br>Design and deploy Level 4 (L4) business processes, governance, and policies<br>Training on process and technology enhancements |
| Enhancements | AIPM | 12/31/2018 | Example enhancements include the following:<br>Setting up multi-year programs and associated projects<br>Establishing a Stage-Gate approval process including Project Initiation Form (PIF) fields for each stage gate<br>Defining an approval hierarchy and automating the approval process through alerts or email notification<br>Provide the ability to evaluate different investment options and evaluate CapEx and OpEx tradeoffs<br>Forecast blanket work including emergency work, customer growth, muni/city/state requests based on historical/projected data and to establish placeholder annual blanket budgets.<br>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.<br>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.))<br>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.<br>Develop rolling multi-year repair vs. replace vs. run to failure vs. maintain decision process<br>Design and deploy Level 4 (L4) business processes, governance, and policies<br>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<br>Equate project estimate inputs into resources (people, material, and equipment) needs<br>Enhanced bundling capability to spatially visualize project location and to bundle projects based on their location (and unbundle)<br>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.).<br>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.<br>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<br>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<br>Supports cross-portfolio integration and provides input and recommendations to the Portfolio Leadership Team as appropriate |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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.<br>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<br>Project Management for the Customer Engagement Module including risk, issue, scope, schedule, budget management<br>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.<br><br>Part 1<br>Enhance core customer community foundation including login, registration and general UI / UX enhancements<br><br>Part 2<br>Customers can:<br>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<br>Schedule appointments with National Grid on their own terms to my home or business – and can change appointments to better fit their schedule<br>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<br>Submit photos to National Grid, e.g. of my meter or problems at my premise<br>Follow up on progress of my requests / appointments and view status<br>Enter preferences for how to be contacted and how to interact with National Grid for use with CxT notification mechanism<br>find out if crews are working in the vicinity |
| CxT Portal & Channel Management | Customer Interaction | PROGRAM = JUNE 2019. | implement foundational infrastructure to allow :<br>Responsive web design<br>leverage a web content management system<br>send data through a Middleware to allow for a consistent message and appearance to customers<br>Ability to enable mobile actions<br>Ability to leverage Identity Access functionality for customers without a single sign on<br>channel preference management; capturing how customers want to be communicated with |
| Large Commercial & Landlord Interaction | Customer Interaction | 7/1/2020 | Commercial & Property owners can:<br>Bundle appointments together to help manage their time effectively, and can change them as needed to any schedule changes<br>View status and progress of requests / appointments<br>Delegate communication and interaction preferences (e.g., delegate point of contact for each of the properties)<br>Submit pictures of e.g. meters on the property<br>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<br>Get information for things that are available, such as the LOFL (Leave on for Landlord)<br>Receive notifications/alerts about an issue at one of my premises – leverage CxT technology<br>Find out if there are crews working in the vicinity |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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<br>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:<br>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.<br>Standardize on a set of engineering tools, SOPs, standards and practices to be used across operating companies<br>Standardize on a common CAD software. Train new users and upgrade existing users.<br>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<br>Provide on-going support for Engineers following the introduction of:<br>Graphical work design (GWD) and estimated with compatible units (CUs).<br>CADand estimated with estimating software (ESW). |
| Design (GWD), Estimating (CU), & Mobility | Engineering, Design, Estimating & Mobility | 9/1/2020 | Design Tool implementation<br>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:<br>Develop and implement the Stage Gate Approval process<br>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.<br>Standardize on a set of engineering tools, SOPs, standards and practices to be used across operating companies<br>Deploy GWD within GIS where the GIS is utilizing an updated landbase and conflated assets.<br>Determine performance KPIs and metrics as well as a post-construction feedback loop for better accountability and continuous improvement.<br>Mobility<br>Expand the mobile capabilities implemented in Release 1 for greater effectiveness in the Design and Estimating arena. The following components are included:<br>Allow for electronic policies, standards and procedures which can be updated in real-time with updates pushed to field users<br>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.<br>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.<br>People<br>Evaluate the balance between centralized/regionalized Engineering resources and the connection to Field Engineering<br>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.)<br>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.<br>Develop a training program to help improve the quality and effectiveness of Design and Estimation resources |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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<br>Collect supply data by gathering large projects plans and budgets<br>Confirm demand drivers<br>Determine the projects vs portfolio mix<br>Develop demand plan by conducting interviews and analyzing project plans<br>Validate and revise demand plan with stakeholders<br>Publish demand plan to stakeholders<br>Develop revision and recurring meeting processes<br>Transfer knowledge to new demand plan owners<br>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<br>Collect supply data by gathering maintenance plans, existing contracts, budgets, and other sources of information from concerned lines of business<br>Develop demand plan by conducting interviews and discussing demand drivers<br>Validate and revise demand plan with Stakeholders<br>Publish demand plan to SC stakeholders<br>Develop revision and recurring meeting processes<br>Transfer knowledge to new demand plan owners<br>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<br>Collect supply data by gathering large projects and program plans and budgets<br>Confirm demand drivers<br>Determine the projects vs portfolio mix<br>Develop demand plan by conducting interviews and analyzing project plans<br>Validate and revise demand plan with stakeholders<br>Publish demand plan to stakeholders<br>Develop revision and recurring meeting processes<br>Transfer knowledge to new demand plan owners<br>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.<br>Evaluate capabilities Gas Operations will need from an Integrated Supply provider<br>Understand the potential benefits and challenges, and develop a strategy for a feasible Integrated Supply solution<br>Propose industry best practices in the priority areas of Safety, Operational Excellence, Customer Satisfaction and Emergency Preparedness<br>Establish a detailed, clear plan to transition project outcomes to Shaping our Future<br>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. |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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.<br>Prepare for analysis and align with all relevant stakeholders<br>Obtain existing KPI repository and establish performance baseline; Data review and cleansing<br>Review and Analyze Inventory<br>Determine inventory classes<br>Analyze inventory usage, excess and obsolescence<br>Identify target inventory by Positioning location and by “Spare” classification<br>Identify root cause and prioritize opportunities<br>Define problem areas/functions, capability gaps, mitigate potential design issues<br>Analyze current state against industry best practices<br>Perform feasibility analysis and highlight priorities for implementation (quick wins, strategic implementations, etc.)<br>Recommend improvement opportunities<br>Develop performance management framework, metric scorecard and tracking parameters<br>Create reports<br>Inventory policy design<br>Design stocking and usage policies for each class;<br>Design optimal stocking and reordering levels for each class<br>Pilot design in chosen geographies<br>Develop deliverables<br>Supply Chain organization Inventory Policy<br>Inventory Performance Metrics scorecard<br>Implementation Plan for Inventory Criteria and Parameters<br>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<br>Determine service levels, item segmentation, critical spares<br>Develop plan for enabling inventory structure<br>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. |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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. |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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:<br>**Centralized**, skilled team to manage and monitor change management activities across the business leveraging budget, time and resource availability<br>**Dedicated** single point of contact to support Projects and Business Function teams' business needs<br>**Standardized** operating model, processes, tools and templates to efficiently and consistently support Projects and Business Functions in all change management activities<br>**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<br>**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. |

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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<br>Develop templates and forms as necessary<br>Define processes to be automated and the design of workflows or methods to automate<br>Conversion of project data<br>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<br>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<br>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<br>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<br>Integrations (across EAM Solution, Resource Management, and Mobility) that leverage Comprehensive Integration Services and potential Mobility Platform Integration Framework.<br>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.<br>Align interface development for Primevera to EAM and Work Management; Develop integrations for associated applications.<br>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.<br>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<br>Update taxonomy on material master<br>Identification of duplicate records<br>Removal of duplicates from material and vendor masters<br>Master data enrichment as per the agreed taxonomy and standards<br>Establish KPIs related to master data request process<br>Provide content for updating business process documentation and training to assist in maintaining the quality of data during create/change/flag for deletion processes |

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

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| **Enhanced Capabilities (including Technical Training) Investment** | | | |
| **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<br>National Grid Employees can:<br>Help customers when they contact us with questions about establishing new service, provide a quote, and help sign up the customer for service<br>Schedule customer appointments that work for them and us<br>View status and progress of a customers request / appointments and provide accurate updates when customers ask<br>Capture and view customer preferences for how to interact with us<br>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<br>Receive and view customer photos (e.g. of their meter)<br>Notify Field on additional information needed next time they go to the customer<br>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<br>National Grid Field Employees can:<br>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<br>Have easy access to information about the Customer and will be prepared when they get to the site<br>Effectively suggest products and services to the customers by receiving prompts on mobile device on what to recommend<br>Send emails to the Customer with tailored information to help them (links to National Grid web pages)<br>Provide field workers with an accurate and near "real-time" view of customer information via their mobile application.<br>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.<br>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:<br>Are customers able to complete an interaction/transaction using the Customer Portal or do they go to another channel to complete the transaction?<br>What is the % of transaction completion success per channel without having to switch channels?<br>If a customer switched, in what moment of the transactions? Did the customer contact us again within 48 hours? etc..<br>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)? |

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| Networking Transportation & Optimization Analysis | Warehousing and Network Optimization | PROGRAM = JULY 2020 | Network Optimization Analysis<br>Validate current and future demand and service levels<br>Define clear scenarios<br>Validate network baseline<br>Analyze warehouses/distribution centers for overall number required, optimal location, ideal sizes, and plan for scaling growth.<br>Determine Benchmarks for distribution, warehousing and handling<br>Refine distribution area to be delivered from each warehouse and to evaluate possible changes in warehouse locations to optimize the network<br>Recommended ways to reduce variability and identified opportunities for cost reduction through production and mode shifts<br>Develop Deliverables<br>Summary of the Scenario Analysis<br>Recommended network strategy<br>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)<br>Implemented change management structure<br>“Quick wins" design and implementation<br>Refined business case and performance tracking model<br>Infrastructure development: design, build, test and migrate<br>Re-design and/or re-tendering of Gas Operations<br>Operating model roll-out |
| Warehousing Optimization | Warehousing and Network Optimization | PROGRAM = JULY 2020 | Warehouse Optimization<br>Organize inventory placement for maximum efficiency and remove material from work areas<br>Review inventory receipt, storage, handling, and job preparation/packing/kitting processes<br>Implement quality improvement program for increased performance and continuous improvement.<br>Establish clear expectations and priorities based on value provided to Gas Operations and overall customer service<br>Equip and enable the workforce for consistent execution<br>Develop Deliverables<br>Implementation Plan for improvement projects<br>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<br>Supports cross-portfolio integration |

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| **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.<br><br>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<br>Work Type(s): Include work types listed in release 1, 3 and 6<br>Implement integration with EAM, Project Management system<br>Enhance EAM capabilities which include auto work notifications, link project info in Project Management system to work orders, job plans and PMs in EAM<br>Enhance Supervisor field mobile with additional capabilities, which include view and track crew/work orders progress spatially and send notification to crews<br>Implement additional field mobile capabilities including mobile red lining, GIS mobile mapping (i.e., integrated with Work Management app)<br>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:<br><br>User Group: Resource Planning<br>Implement integration with Project Management, EAM, and HR (People/User) systems<br>Provide one global view of work and resources (internal and contract resources)<br>Design and deploy business and decision-making processes, governance, and policies including divisional nuances to support continuous improvement<br>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.)<br>Ability to optimize forecast of work to resources<br>Provide training on process and technology enhancements |

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Cases 17-E-0238 and 17-G-0239

August 2017

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Prepared Testimony of:

Staff Gas Business Enablement Panel

Aric Rider
Utility Supervisor

Allison Manz
Supervisor, Utility Accounting and Finance

Andrew Timbrook
Utility Engineer II

Michael Augstell
Principal Utility Financial Analyst

Albany
State of New York
Department of Public Service
Three Empire State Plaza
Albany, New York 12223-1350

**Introductions and Qualifications**

Q. Members of the Staff Gas Business Enablement Panel, please state your names, employer and business address.

A. Our names are Aric Rider, Allison Manz, Andrew Timbrook and Michael Augstell. We are employed by the Department of Public Service (Department) and our business address is three Empire State Plaza, Albany, New York 12223.

Q. Mr. Rider, are you the same Aric Rider who is testifying as part of the Staff Policy Panel in these proceedings?

A. Yes. I provide my credentials in that testimony.

Q. Ms. Manz, are you the same Allison Manz who is testifying as part of the Staff Policy Panel in these proceedings?

A. Yes. I provide my credentials in that testimony.

Q. Mr. Timbrook, are you the same Andrew Timbrook who is testifying as part of the Staff Information Systems Panel in these proceedings?

A. Yes. I provide my credentials in that testimony.

Q. Mr. Augstell, are you the same Michael Augstell who is testifying as part of the Staff Policy Panel in these proceedings?

A. Yes. I provide my credentials in that testimony.

**Scope of Testimony**

Q. What is the purpose of your testimony in this proceeding?

A. We will explain our findings and recommendations concerning the Gas Business Enablement (GBE) program and related financing option proposed by Niagara Mohawk Power Corporation d/b/a National Grid (Niagara Mohawk or the Company) in its rate filing made on April 28, 2017 and corrections and update (C&U) filing made on July 10, 2017.

Q. What is the Rate Year in these proceedings?

A. The twelve months ending March 31, 2019. This period coincides with Niagara Mohawk's fiscal year 2019.

Q. Will any recommendations made by the Staff Information Services Panel, or SISP, apply to GBE?

A. Several recommendations made by the SISP will apply to GBE, as it is an information services,

or IS, investment. These adjustments are described in SISP testimony, and include: the slippage adjustment to capital expenditures and operating and run the business expenses; an adjustment to the National Grid USA Service Company (National Grid USA or Service Company) return on all IS investments; the downward-only reconciliation of capital expenditures associated with Niagara Mohawk's Service Company Rent Expense; and the capital expenditure and variance reporting requirements for the Company's IS investments.

Q. What additional recommendations will you have specifically for GBE?

A. Our recommendations for GBE include: (1) benchmarks to measure the successful implementation of GBE and to verify that customers receive the program benefits; (2) a cap on GBE costs to be recovered from Niagara Mohawk customers; and (3) specific recommendations concerning the Company's financing proposal.

Q. In your testimony, will you refer to, or otherwise rely on, any information obtained

during the discovery phase of this proceeding?

A. Yes. We rely on several responses provided by the Company to information requests (IRs). These responses are included in Exhibit___(SGBEP-1), and will be referred to using the Departments assigned request number (e.g., DPS-1). For instance, the Department's first IR was identified as DPS-1.

Q. Is the Panel sponsoring any other exhibits?

A. No.

**Gas Business Enablement**

Q. What is GBE?

A. As explained beginning on page 87 of the Company's Gas Infrastructure and Operations Panel testimony, GBE is a framework of new technology solutions and business process changes that National Grid USA, Niagara Mohawk's parent company, believes are necessary to strengthen and improve the performance of National Grid USA's gas business across multiple service territories. Niagara Mohawk states that National Grid USA's gas businesses, including Niagara Mohawk, need to replace aged computer systems, improve gas safety performance, deliver

complex capital investment programs, and meet customers' expectations. The Company claims that GBE was developed through an internal collaboration among National Grid USA's business units as a holistic transformation to deliver improvements and build a platform that supports future system needs.

Q. Why did the Company assert GBE is needed?

A. The Company states four main reasons as the drivers behind developing the GBE program: (1) the age of its software systems; (2) gas safety performance and regulatory compliance; (3) the increasing complexity of its capital investment program; and (4) evolving customer expectations.

Q. Why does the Company claim it needs the GBE program to address its aging software systems?

A. The Company states in its response to IR DPS-432, that GBE will replace the 50 existing Niagara Mohawk systems with 19 new systems. Across the entire Service Company, GBE will reduce the 117 existing systems to those same 19 new systems. Further, it states that the average age of those systems is 11 years. Accordingly, the Company believes that an

investment in new software systems is warranted.

Q. What issues has the Company had with gas safety regulatory compliance?

A. According to the response to IR DPS-643, the Company indicated that it had violations related to Leaks, Maintenance, Operations, Piping Beyond the Meter and Corrosion Control. Currently, Niagara Mohawk uses paper-based processes to manage compliance for all but the Piping Beyond the Meter category.

Q. According to the Company, how will GBE help improve its gas safety regulation compliance performance?

A. The Company states, in the response to IR DPS-643, that mobile applications can replace the current paper-based processes that are used by the Company for Gas Repair Orders, Gas Facility Data Reports, Leak Investigation Report Forms, and Warning Tags. User prompts and programming logic can help ensure that all steps are followed in accordance with procedures and data are correctly entered and recorded in a way that paper processes cannot. The electronic data can then be transferred to the Company’s Enterprise

Asset Management System, Customer Service System, & Mobility System for follow up remediation and work management. Niagara Mohawk states that GBE will also improve its asset management with a new geographic information system (GIS), or mapping system, that can provide a better interface for analyzing and storing data. The Company states that new GBE platforms will lead to better record keeping to document compliance.

Q. According to the Company, how will GBE improve its capital investment program?

A. The Company claims improved asset data visibility, combined with workforce management and productivity enhancements, will lead to a better capital planning process and a more productive workforce. Better asset management capabilities would give Niagara Mohawk the ability to perform asset condition assessment and risk ranking and prioritization of asset replacement.

Q. What evolving customer expectations has the Company observed and how does GBE allow it to meet them?

A. The Company notes that customers seek improved customer appointment scheduling in terms of both appointment window length and self-scheduling. A new customer portal would allow for those capabilities, plus help address inquiries for new gas service or provide information on work in a customer's neighborhood. An employee portal would allow all employees, both field and call center, to have access to data relevant to customer inquiries to provide better informed responses to inquiries. An employee portal could also assist the Company's field crews with automated compliance documentation and video training capabilities.

Q. What other benefits does the Company claim are provided by GBE?

A. Beyond the benefits we have discussed, the Company also advocates the same objective for GBE as the overall IS investment: consolidation and integration of multiple platforms across its operating companies. In addition, the Company estimated revenue requirement savings, both in reduced costs, referred to as "Type 1" benefits, and avoided future costs, referred to as "Type

2" benefits. These are included in the rate filing and listed in Exhibit___(GIOP-12).

Q. Describe the Type 1 benefits.

A. The Company provided five quantified Type 1 savings from GBE, shown in Exhibit ___(GIOP-12) and explained in more detail in its response to IR DPS-430. The first is a reduction, or redirection, in operating expenses through the use of the Asset Investment Planning and Management (AIPM) tool. The Company states that its new AIPM tool and advanced analytics capabilities will allow it to reduce operating expenses through better informed repair versus replace decisions. This benefit is calculated as a 0.82 percent reduction in its controllable operating expenses, with annual savings for Niagara Mohawk of $2,279 beginning in fiscal year 2021 and fully realized annual savings for Niagara Mohawk of $328,242 in fiscal year 2023. The second Type 1 benefit is a reduction in damages that currently result from data quality errors. Due to record or locator errors, Niagara Mohawk incurs costs from fixing the resulting damages. These annual savings for

Niagara Mohawk are estimated at $6,937 in the Rate Year, with fully realized annual savings in fiscal year 2020 at $27,748. The third Type 1 benefit is clerical/back office productivity improvement. This benefit results from clerical staff no longer needing to input data into multiple systems, which the Company assumes will result in a productivity increase of two hours per employee per day. The annual savings to Niagara Mohawk from this benefit begin in fiscal year 2020 at $2,957, with peak annual savings of $212,899 realized in fiscal year 2022. Another Type 1 benefit is reduced travel mileage for damage prevention. The Company anticipates that software to optimize technician routing can reduce the necessary mileage to jobs based on running simulations on the optimization software. The annual savings to Niagara Mohawk for this benefit are $4,627 beginning in fiscal year 2020 and are full realized in fiscal year 2021 at $6,169. The fifth and final Type 1 benefit is from productivity improvements. This benefit results from field technicians' ability to document and access data in the field more

easily with the elimination of paper forms and was calculated assuming productivity would improve by three percent. The annual savings to Niagara Mohawk would begin in fiscal year 2020 at $124,375, with fully realized annual savings of $895,502 by fiscal year 2022.

Q. Do any Type 1 savings occur in the Rate Year?

A. Yes. As described previously, the Company projects savings from a reduction in damages due to data quality errors in the Rate Year totaling $6,937. This amount is reflected in the revenue requirement in Exhibit___(RRP-3), Schedule 27.

Q. How did the Company estimate program costs and develop the implementation plan for GBE?

A. The Company hired two consultants, Accenture and PricewaterhouseCoopers (PwC), as partners to develop the costs and implementation road map for GBE. According to the response to IR DPS-431, Accenture used its proprietary model to estimate costs using a bottom-up approach. Cost estimates are based on two inputs: labor rates and hours required for each type of position, and also include the cost of software and hardware. PwC’s role was to check the cost

estimate provided by Accenture to ensure it aligned with industry benchmarks and to evaluate the GBE roadmap to make sure it would provide the program objectives, that the scope was achievable, and that the software applications were appropriate to support the program objectives.

**GBE Revenue Requirement**

Q. Describe how GBE relates to the Company's total proposed IS investment.

A. The Company's GBE program is included in its overall IS investment plan. However, it is treated as a stand-alone, single project by the Company, separate from the other IS initiatives. In response to IR DPS-433, Question 5, the Company explains that "GBE does not rely on other IS programs for functionality."

Q. What is the cost of GBE for National Grid USA?

A. The GBE investment totals $478 million for National Grid USA, and, similar to the other IS investments, will be implemented across National Grid's seven gas operating companies.

Q. How was that cost allocated to Niagara Mohawk?

A. Costs for GBE were separated into capital,

operating and “run the business” (RTB) expenses, similar to the other IS projects as described in the Staff Information Systems Panel’s testimony. All GBE capital spending is amortized over ten years and allocated using the C-210 allocator, which allocates costs across all gas operating companies based on the number of customers. This resulted in an allocation of 16.89 percent of all GBE costs to Niagara Mohawk.

Q. What is the cost of GBE to Niagara Mohawk?

A. When allocated its 16.89 percent, GBE will cost Niagara Mohawk approximately $77.4 million.

Q. What is the proposed timeline for GBE implementation?

A. GBE will be implemented over a five year period, beginning in fiscal year 2018 and being completed by the end of fiscal year 2023.

Q. What costs have already been incurred for GBE?

A. The total cost of $478 million includes approximately $20 million that was previously spent in fiscal year 2017 on project research and development costs. Of this $20 million, none is included in the Company’s filing to be recovered from Niagara Mohawk’s customers.

Q. Where are the GBE capital costs addressed in the Company's testimony and exhibits?

A. The GBE program is discussed in the Company's Gas Infrastructure and Operations Panel testimony, from Pages 87 to 105. The GBE Capital projects for the Rate Year are listed on Exhibit___(ISP-3) and total $104.6 million for National Grid USA. The resulting revenue requirement for Niagara Mohawk is shown on Exhibit___(RRP-3), Schedule 9 and totals $1.775 million after the costs are allocated, amortized and the return is calculated. This process is shown in Exhibit___(RRP-11), workpaper to Exhibit___(RRP-3), Schedule 9, Workpaper 3.

Q. Where are the GBE operating costs addressed in the Company's testimony and exhibits?

A. Operating expenses associated with the GBE program are shown in Exhibit___(GIOP-10) and total $64.1 million for National Grid USA in the Rate Year, of which $9.6 million and $198,000 is allocated to Niagara Mohawk's gas and electric businesses, respectively. RTB expenses are shown in Exhibit___(GIOP-11), with incremental RTB costs from GBE totaling $7.1 million for

National Grid USA in the Rate Year, of which $1.2 million is allocated to Niagara Mohawk.

Q. What is the total Rate Year revenue requirement impact of GBE to Niagara Mohawk?

A. Including the capital, operating and RTB expenses discussed previously, the total Rate Year revenue requirement impact to Niagara Mohawk is approximately $12.8 million.

**Past Implementation Results**

Q. Has National Grid USA undertaken any large scale IS investments in the past five years?

A. Yes. In 2012, National Grid USA was scheduled to implement the U.S. Foundation Project, or USFP. The implementation of this project is discussed in the “Northstar Report” sumbmitted to the Commission by the Northstar Consulting Group in Case 13-G-0009. The Northstar Report is available on the Commission’s website.

Q. What was the purpose of Case 13-G-0009, and why was the USFP the subject of a consultant report?

A. Case 13-G-0009 was a comprehensive management and operations audit of National Grid USA’s three natural gas companies operating in New York State: Niagara Mohawk, The Brooklyn Union

Gas Company d/b/a National Grid NY (KEDNY) and KeySpan Gas East Corporation d/b/a National Grid (KEDLI). This audit focused on the construction program planning, operational efficiency and risk management efforts. Within that scope, the Northstar Report documents the timeline and implementation of the USFP by National Grid USA and includes recommendations and findings.

Q. What was the purpose of the USFP?

A. The Northstar Report explains that, following the 2007 merger between National Grid USA and the parent of KEDLI and KEDNY, National Grid USA developed a solution to replace and integrate multiple systems and processes across its operating companies. This undertaking was called the USFP, and its objective was to achieve a consolidated platform that replaced the Oracle and PeopleSoft Enterprise Resource Planning, or ERP, suites with SAP, which stands for Systems, Applications and Products, thereby providing improved functionality. The USFP addressed the following information technology platforms: Human Resources, supply chain, finance, customer master data, non-utility

billing, supplier self-service, business information warehouse, and business objects planning and consolidation.

Q. What was the estimated cost of the USFP?

A. As stated in the Northstar Report, the USFP was initially sanctioned in June 2009. The final USFP sanction, approved in 2012, included $392.8 million in total project costs, which included software license fees.

Q. What does it mean when a project is sanctioned?

A. For projects over $1 million, Niagara Mohawk must complete the sanctioning process for approval through National Grid USA's Sanctioning Committee. This process identifies appropriate spending levels based on project details and cost estimates. Projects can be sanctioned several times before the final sanction amount is determined.

Q. When was the USFP scheduled to begin operating?

A. The "go live" date initially was scheduled for October 1, 2012, with a simultaneous launch for all new systems across all operating companies. National Grid USA postponed the go live date to November 5, 2012.

Q. Did the Northstar Report identify any problems with the USFP implementation?

A. Yes. National Grid USA experienced several issues after the new system went live on November 5, 2012. The first payroll to be processed had many errors, and errors continued to occur for almost a year after the go live date. Additionally, supply chain issues appeared within a month of the go live date. Further problems arose with National Grid USA's closing of first month's financial books after the go live date. That closing took 43 days, compared to less than seven days for closings using the previous systems. Finally, managers had issues generating reports. Specifically, no detailed cost reports were generated until November 2013, almost one year after the USFP went live.

Q. How did National Grid USA respond to these implementation issues?

A. National Grid USA formed a "USFP Stabilization Program" in mid-November 2012 to address these issues. It also formed the USFP Business Improvement Program to attempt to deliver the

full USFP benefits. These additional programs caused significant overspending beyond the project budget.

Q. Did the Northstar Report explain why the USFP implementation had these issues?

A. The Northstar Report findings and conclusions are summarized beginning on Page 12 of Chapter IV. The Northstart Report includes seven conclusions for why the USFP implementation experienced overspending and functionality issues that we believe are also relevant to GBE. First, National Grid USA was unprepared for the complexity and magnitude of the USFP and should have had discussions with other utilities to gain industry experience before implementation. Second, National Grid USA's financial processes lacked sufficient internal controls, and while the USFP was expected to solve this issue, the end result was that the SAP program implemented through the USFP did not solve the internal control issue. Third, National Grid USA was unable to quantify the incremental benefits from the USFP, such as improved operational efficiencies, consolidation and cost reductions,

and therefore it was difficult to measure program success. Fourth, National Grid USA did not focus sufficiently on the individual utilities. Fifth, the staff at these utilities were not able to generate the reports needed for managers to make informed decisions due to lack of training or ability. Sixth, zero-based budgeting was not used to forecast operations and maintenance (O&M) budgets. Seventh, the capital review and planning process for National Grid USA focuses too heavily on spending variances and not enough on the underlying drivers of these variances.

Q. How much did the implementation issues and necessary fixes increase the USFP budget?

A. According to the Northstar Report, the budget for the USFP was $392.8 million, whereas actual spending was $945.1 million. Thus, the implementation issues and necessary fixes resulted in spending more than double what National Grid USA had budgeted.

Q. What did the Northstar Report recommend concerning the increased cost?

A. It recommended that National Grid USA file a

report with Department of Public Service Staff detailing the capital and operating expenses associated with increased costs from fixing the implementation issues. The report would be used to ensure that ratepayers would not be responsible for those costs in the future.

Q. Please explain the relevance of the conclusions summarized above to GBE.

A. We are concerned that the same, or similar, issues could affect National Grid USA's effort to carry out the full scale of its planned GBE implementation.

Q. Did the Company's implementation plan specifically address the concerns raised by the Northstar Report?

A. Yes, in some instances.

Q. Please identify how the GBE implementation plan did or did not address each conclusion from the Northstar Report, starting with the conclusion that National Grid USA was unprepared for the complexity and magnitude of the USFP and should have had discussions with other utilities before implementation.

A. In its preparation for GBE, National Grid USA

conferred with three other utilities. Attachment 2 to the response to IR DPS-433 details the lessons learned by the Company from this process and how those lessons were incorporated into the GBE implementation plan. The list of lessons learned includes: a phased approach to implementation, talent growth by hiring new employees for the new systems, directly engage impacted users, focus on data scrubbing and quality, and a “pulse check” evaluation process to engage employees during implementation.

Q. How did the Company address Northstar’s conclusion that, while the USFP was expected to solve its financial internal controls issues, it ultimately did not?

A. The Company did not address this issue in the current implementation plan. Specifically, the Company has stated it expects GBE programs to provide additional internal controls to improve its gas safety compliance by replacing manual processes with electronic ones, as stated in the response to DPS-432, Question 11. While we support the GBE investment conceptually, we are

concerned that the internal controls built into the program functionality may not fully solve the Company's internal controls issues, similar to what happened with the USFP and financial internal controls.

Q. What do you recommend?

A. The Company should provide a plan for how it can eliminate gas safety compliance issues resulting from insufficient or ineffective internal controls, and, to be conservative, it should assume that the GBE program will not definitively fix the compliance issues.

Q. How does the Company's implementation plan quantify the incremental benefits from GBE and propose to measure program success?

A. As discussed, Exhibit___(GIOP-12) lists expected benefits from GBE, including those that directly reduce revenue requirement and those that avoid future costs. The benefits that directly impact revenue requirement are driven by productivity and efficiency gains, such as reduced travel time, streamlined workloads and a reduction in compliance and gas safety penalties. The Company provided the calculation behind the

benefits that reduce the revenue requirement in its response to IR DPS-430. We will address these benefits in more detail later in our testimony. The Company explained, in a technical session, that it developed eight key performance indicators to measure improvements delivered. They are: (1) average unproductive time; (2) average number of complete jobs; (3) average number of work orders processed; (4) total call volume; (5) customer effort rating; (6) number of construction projects delayed due to supply chain issues; (7) inventory turnover; and (8) total compliance negative revenue adjustments.

Q. The Northstar Report concluded that National Grid USA did not focus sufficiently on individual utilities in its rollout of the USFP. Is that different with this IS investment?

A. Yes. For projects that apply to multiple operating companies, such as GBE, National Grid USA is taking an “agile” approach where each new software platform will be implemented fully in each operating company, one at a time. This differs from National Grid USA’s approach to the

USFP, where a single “go-live” date was selected for the USFP across all operating companies.

Q. Does the “agile” approach sufficiently address this issue?

A. While only real world experience can provide a definitive answer to this question, we concur that the agile approach reflects a reasonable effort to address the problems stemming from the universal go live date from the USFP. Fully implementing and testing each program in one operating company before moving on to the next allows the Company to better control any issues that arise. Learning during implementation without causing significant problems for its entire business, as happened during the roll out of the USFP, will help National Grid USA avoid resource issues that arise from fixing problems and running its businesses simultaneously.

Q. According to the Northstar Report, utility staff were not able to properly query data and generate sufficient reports for managers. Has this issue been addressed?

A. Generally, yes. Front line employees were engaged early in this process, involving them in

the solution. The implementation plan calls for employee engagement throughout the implementation process and new employees will be hired to learn the new software from the initial phase. However, we do have some reservations in this area, as it is difficult to quantify employee acceptance and preparedness for implementing and using the new processes.

Q. Please define zero-based budgeting.

A. Zero-based budgeting, as it relates to cost estimation, means that each budget item is analyzed to determine its future costs without using historic costs. In other words, specific variables and inputs are used to “build” the budget starting from $0, rather than extrapolating from historic spending.

Q. Did National Grid USA use zero-based budgeting to forecast O&M budgets for GBE?

A. Yes. For GBE, zero-based budgeting was used by the two consultants, PwC and Accenture, to forecast both capital and O&M budgets.

Q. Has the Company demonstrated a shift in its capital review and planning process from a focus on spending variances to a focus on identifying

the underlying drivers of these variances?

A. No, not that we could discern from the information provided to us.

Q. Overall, how did National Grid USA address the issues raised in the Northstar Report?

A. While the Company did address several of the issues raised, it left others unaddressed. Ultimately, National Grid USA is yet to show that it is capable of fully implementing this level of IS investment on time and on schedule.

**Staff's Review**

Q. What approach did you take to reviewing the Company's proposed GBE program?

A. First, we used technical sessions and field visits to better understand the goals and objectives of GBE, the reasons for the investment, and the development of the program. There was one technical session specifically for GBE, along with the several technical sessions discussed in the Staff Information System Panel's testimony concerning the Company's project selection and sanctioning process for all of IS, including GBE. Meeting with Company field employees during our gas capital

expenditure review allowed us to observe the limitations placed on them due to working with the Company's current software, hardware and paper processes. Second, we evaluated Accenture's cost estimation. Third, we reviewed the alternatives National Grid USA and Niagara Mohawk considered and the associated benefits to each investment option.

**Cost Estimation**

Q. Did you review Accenture's cost estimate of GBE?

A. Yes, as much as we were able to obtain. The full model was proprietary information which Niagara Mohawk was unable to provide. However, the Company's confidential response to IR DPS-654 did provide us with the inputs to Accenture's model. We were able to confirm that the program cost was estimated using a bottom-up approach and based on the estimated number of labor hours needed to implement the program, the hourly rates for specific types of both internal and external employees and software and hardware costs.

Q. How did National Grid USA verify that the cost estimate provided by Accenture was reasonable?

A. PwC was retained to verify the cost estimate provided by Accenture aligned with industry benchmarks for similar scale projects. The response to IR DPS-431 shows the report from PwC that contains, along with a full review of the implementation plan, scope, design process and risk analysis of GBE as developed by Accenture, its determination concerning the cost estimate of GBE. The report states that PwC determined the cost estimate from Accenture of GBE was reasonable.

Q. Given this verification from PwC, are you concerned with the reasonableness of the cost estimate for GBE?

A. Yes. While we generally approve of National Grid USA's approach to estimating the GBE costs and developing a plan for implementation by hiring Accenture and PwC, GBE, a unique large scale investment, is a difficult undertaking to estimate costs for. Therefore, we believe the various customer protections that we are recommending, including the downward only true up of Service Company Rents, a cost cap for GBE, and benchmarking, are necessary to ensure

customers are protected for any variance between estimated and actual costs.

**Alternatives Considered**

Q. Did you review the alternatives that National Grid USA considered when it planned GBE?

A. Yes. National Grid USA considered five alternatives: (1) tech stabilization; (2) like for like replacements; (3) “backbone;” (4) value-oriented jurisdictional deployment; and (5) value-oriented accelerated deployment. Descriptions of the different alternatives are included in its response to IR DPS-689.

Q. Describe tech stabilization.

A. This alternative would provide any available support and updates to the Company’s current software systems but would not replace any of them. This would be a temporary solution, extending the life of the current systems until they could be replaced.

Q. Why did National Grid USA reject the tech stabilization alternative?

A. National Grid USA did not view this as a viable, long term solution, as it did not address any of the current IS issues and involved spending

money on obsolete or unsupported systems.

Q. Describe the like for like replacements alternative.

A. Under this alternative, National Grid USA would replace each software system with its supported equivalent. This alternative would not deliver any additional capabilities or consolidation of systems but would address the issue of having aging, unsupported systems.

Q. Why was this alternative rejected?

A. While this option would address its aging systems, National Grid USA states that it would not address other issues such as integrating and consolidating its myriad systems, training and data management, gas safety and other process improvements. The goal to align processes and gain efficiencies with this IS upgrade was important and National Grid USA did not believe this alternative provided it with that option.

Q. Describe the third alternative, or backbone alternative.

A. This alternative would provide more integration and systems consolidation than like for like replacement, but would not provide the switch

from paper to electronic documentation of field work, the full integration of data needed for the customer call center to improve its data access, or analytics for data and asset management. According to the response to IR DPS-689, a full implementation timeline of three and a half years was developed for this alternative with a total cost estimate of $273 million.

Q. Why did National Grid USA reject the backbone alterative?

A. Ultimately it was determined that this option would not provide the full range of benefits desired, and could potentially offset financial benefits with inefficient use of the new systems resulting from to the lack of full integration and additional capabilities.

Q. Describe the value-oriented jurisdictional deployment alternative.

A. This is the option National Grid USA selected and has proposed as GBE in this case.

Q. Describe the value-oriented accelerated deployment alternative.

A. This alternative is the same as the chosen GBE

proposal, but on an accelerated timeframe, to be implemented in four and a half years instead of five.

Q. Why was this alternative rejected?

A. This alternative was rejected because of higher costs, $466 million compared to $458 million for the selected proposal, and the increased implementation risk from the shorter timeframe. The estimates of $458 million and $466 million do not include the $20 million of development costs already spent.

Q. Did National Grid USA adequately pursue the different alternatives?

A. Yes. As demonstrated in the response to IR DPS-689, multiple alternatives were sufficiently developed with, at least, a high level cost estimate and implementation schedule, benefits and capabilities.

Q. Which alternative would you classify as the minimum level of investment that needs to be made?

A. The backbone alternative represents the minimum investment that National Grid USA needs to make to improve capabilities, acquire new, fully

supported IS platforms and achieve platform consolidation. Accenture estimated the cost of this investment as $273 million.

Q. Is that minimum investment necessary?

A. Yes. Given the age of the systems, an investment in new systems is certainly necessary at this time.

Q. Why is the backbone alternative the preferred minimum investment compared to the first or second alternatives?

A. The tech stabilization alternative does not represent a viable solution to the Company's IS situation. Incurring significant costs to maintain existing, outdated, and unsupported systems is an inefficient and temporary solution, when money could be spent on a longer-term solution. The like for like replacement second alternative is workable, as it would address the Company's aging systems. However, it does not represent the most efficient or sustainable solution, as, once those systems are aged, the Company would be in the same situation it is now: looking for synergies between its significant number of unintegrated applications

and struggling to find a solution to those inefficiencies. Ultimately, the Company should use this investment to improve this situation. The backbone alternative represents the minimum cost to replace the Company's IS platform with an integrated, improved solution.

Q. Why did National Grid USA choose the proposed GBE option?

A. As described previously, there was a desire for additional capabilities beyond what the current IS platforms can deliver, to improve, among other things, its customer service, gas safety regulatory compliance, capital investment planning and workforce management and training processes. The chosen GBE proposal provides these capabilities, while the first three did not. While the accelerated implementation alternative provided the same capabilities as the selected alternative, National Grid USA preferred a longer period to take on less implementation risk and reduce overall costs. Further, in a technical session, the Company stated that the incremental costs of the selected alternative, GBE, over the backbone

alternative, will be paid back by the resulting savings from GBE four years and four months after full implementation.

Q. How much more than the backbone, or preferred minimum investment, alternative does National Grid USA propose to spend for the additional capabilities provided under its GBE proposal?

A. Over the course of the five year implementation plan, GBE costs $458 million. Comparatively, the backbone option costs $273 million. Therefore, National Grid USA proposes to spend an incremental $185 million for the added capabilities.

Q. Do you agree with the decision to spend an additional $185 million for its proposed GBE program with these capabilities?

A. Yes, however with reservations.

Q. Please explain.

A. First, as we have already said, we recognize the need for a minimum level of investment in the gas IS platforms. Given the age of the current software and the risk to the Company, ratepayers and the general public of running the gas system on unsupported software, some investment is

needed at this time. Second, we support the goals and objectives that the Company expects to attain through GBE. While many of the benefits are difficult to quantify, operating a utility with modern technological capabilities to analyze data and make better investment decisions is an opportunity that the Company reasonably wants to take advantage of. Third, we caution that solutions are only as good as the estimates of costs and benefits. If the actual benefits do not outweigh the actual costs, then the wrong solution may have been chosen. Fourth, given National Grid USA's past implementation issues with the USFP in 2012, while recognizing that National Grid USA's GBE implementation plan does address some of the issues from the USFP implementation, it has yet to demonstrate that it can manage an IS investment of this scale without delays in delivering the full benefits or escalating costs. Additionally, we share the concerns discussed in the Staff Information Systems Panel's testimony. In this overall context, we have serious concerns about National Grid USA's

ability to provide the benefits of its GBE proposal in a timely and cost effective manner. We, therefore, recommend allowing the Company to move forward with its GBE plan but with several protections for ratepayers.

**Customer Protections**

Q. Please describe your recommended customer protections.

A. As an initial matter, we recommend that all customer protections recommended by the Staff Information Systems Panel for the IS investments, generally, apply to the GBE program as well, since it is part of the overall IS investment. This includes the 37 percent slippage adjustment to account for historical underspending and the downward-only reconciliation for IS capital expenditures. This also includes the general reporting requirements the Staff Information Systems Panel is recommending. The IS investment reports should have a section specific to the GBE program spending, variance, with explanation of causes, and progress.

Q. Why should these general IS spending protections

be required for the GBE program?
A. The customer protections are designed to protect ratepayers in the event that program implementation is delayed or overall costs increase, and to ensure that Niagara Mohawk only retains revenues for the IS investment that is actually made.
Q. Do you recommend additional customer protections specific to GBE?
A. Yes, because the general IS spending protections will not ensure that the GBE program benefits are delivered by the Company as scheduled and to the full degree envisioned.
Q. What additional protections do you recommend?
A. We recommend an overall cap on the amount that can be recovered from ratepayers for GBE, and we also recommend instituting benchmarks to ensure that the Company delivers the incremental benefits of GBE compared to the backbone alternative.
Q. What cap do you recommend imposing on the amount Niagara Mohawk can recover from ratepayers for GBE?
A. The total cost of the GBE project to Niagara

Mohawk customers is $49.6 million in total capital expenditures and $31.2 million in total operating expenses. The Company should not earn a return of and on capital costs or be allowed the recovery of operating costs that exceed these amounts to implement GBE. These amounts are the portion of the total forecast program cost of $458 million allocable to Niagara Mohawk.

Q. Why should the Commission limit the total cost of the GBE project to be recovered from customers?

A. Niagara Mohawk asserts that the incremental investment of $185 million is cost beneficial. If, however, the program costs exceed Niagara Mohawk's forecasts, while providing the same level of benefits, the program may not be cost effective. More fundamentally, as we discussed with regard to the USFP and the Northstar Report, National Grid USA has yet to demonstrate that it can implement a large IS project within budget. The overall cost cap will provide a strong incentive to National Grid USA to manage scope, timing and cost of the project.

Q. Why do you recommend instituting benchmarks for the delivery of benefits promised through GBE?

A. Given the nature of the incremental investment of $185 million by National Grid USA to replace its gas business software platforms with software that provides new capabilities, we recommend that the Company be required to demonstrate the successful delivery of these capabilities through clear and measurable benchmarks. A demonstration of the successful delivery of the capabilities and customer benefits being tracked would result in the Company's full recovery of the incremental investment to achieve these benefits, up to the amounts forecast by the Company in these proceedings. If, however the Company cannot deliver the benefits and capabilities that it claims GBE will provide, then the Company should be required to forgo or return to customers the incremental costs associated with those benefits and capabilities.

Q. What capabilities or benefits should be measured?

A. We have identified three capabilities that we

recommend measuring as benchmarks to ensure that customers receive the full benefits of GBE after implementation.

Q. Please describe the first benchmark.

A. The first is customer appointment windows, discussed in the Company's response to IR DPS-658. As described in this response, the new customer scheduling tool should allow a reduction in customer appointment windows from eight hours to between two and four hours, and, according to Exhibit___(GIOP-9), is scheduled to be implemented in October 2019. Therefore, the Company should be required report its actual average customer appointment windows for calendar year 2020. If this average is less than four hours, then the benefit has been delivered.

Q. Please describe the second benchmark you recommend?

A. The second benchmark would be the number of damages due to data quality errors. In Exhibit___(GIOP-12) and in its response to IR DPS-430, the Company stated a goal of lowering its three-year average number of mismarks to

move 50 percent of the way between its present performance and the American Gas Association's (AGA) three-year average number of mismarks for similar sized utilities. If it meets this goal, Niagara Mohawk would reduce its current three-year average of 28 mismarks in calendar years 2013 through 2015 to 16 mismarks by the end of fiscal year 2022.

Q. Why is the end of fiscal year 2022 the appropriate measuring point?

A. According to the response to IR DPS-430, the end of fiscal year 2022 is the appropriate measuring point since the first full year of data after implementation of the relevant GBE component would be collected by the end of fiscal year 2020. Thus, by the end of fiscal year 2022, the Company will have a three-year average based fully on data using the new GBE systems.

Q. What is the third benchmark you recommend?

A. We recommend a benchmark measuring GBE's impact on Niagara Mohawk's gas safety compliance, specifically to violations resulting from inefficient paper processes. Due to the functionality to be added through GBE, moving

from paper to electronic processes with better manager oversight and internal controls should improve compliance. In its response to IR DPS-643, the Company provided safety violations from 2012 through 2016 and described how GBE is designed to correct each of them. For each of the five categories listed, leaks, maintenance, operations, piping beyond meter, and corrosion control, the Company states that a mobile application will improve performance.

Q. How would you benchmark GBE's success toward correcting those processes?

A. We recommend that by the conclusion of fiscal year 2023, when GBE is scheduled to be fully implemented, the Company should not incur any negative revenue adjustments resulting from noncompliance with the categories listed in IR DPS-643.

Q. Should the Company propose additional benchmarks to measure the success of GBE?

A. Yes. We encourage the Company to propose additional ways to use data to clearly measure the successful implementation of GBE and the delivery of new capabilities, which have

benchmarks that are easily measured. As described previously, the Northstar Report found that one of the failings in the roll out of the USFP was the lack of quantification of benefits, which would have provided a clear way to measure the success of the program. Therefore, in addition to the benchmarks we recommend instituting, we think it is important that the Company propose additional benchmarks.

Q. If the Company cannot demonstrate that it delivered the benefits of GBE by delivering results on all measureable benchmarks described, what do you propose concerning rate treatment of the incremental investment of $185 million?

A. We recommend that any amount incorporated into Niagara Mohawk’s rates and paid by ratepayers be deferred for credit to ratepayers in the next rate case. The response to IR DPS-660 shows the amount of the incremental investment scheduled for the Rate Year and fiscal years 2020 and 2021. Niagara Mohawk’s share of the $185 million incremental investment is $31.2 million, or 16.89 percent, which includes both incremental capital expenditures and upfront

operating expenses. We recommend that any of this $31.2 million that was paid by ratepayers, whether through recovery of operating expense or a return of and on capital expenditures in Service Company Rents, be refunded through a deferred liability if the benchmarks are not achieved.

Q. What would be the result if Niagara Mohawk meets one or two, but not all of the benchmarks?

A. If the Company meets one or two of the three benchmarks we recommend, they should be allowed to retain a prorated portion of Niagara Mohawk's $31.2 million allocation of the $185 million incremental investment in IS. For example, if the Company meets two of the three benchmarks, it should be entitled to recovery of two thirds, or 66.7 percent, of the $31.2 million, or $20.8 million. For the remaining one third, or $10.4 million, any of this amount that was paid by ratepayers, whether through recovery of operating expense or a return of and on capital expenditures in Service Company Rents, should be refunded through a deferred liability, similar to the full amount if no benchmarks were

achieved.

Q. Should the incremental investment be tied to additional reasonable benchmarks the Company may propose?

A. Yes. If the Company proposes additional benchmarks that effectively and clearly measure the delivery of the incremental capabilities GBE promises, then those benchmarks should be added to the three benchmarks we recommend. In other words, if the Company proposes one additional benchmark that the Commission determines to be a reasonable one, then attaining each benchmark would equate to one quarter of the incremental investment.

**Financing Proposal**

Q. Please summarize the Company's cost recovery proposal associated with GBE.

A. The Company has included approximately $12.8 million in the Rate Year revenue requirement associated with GBE. This revenue requirement is based on the traditional method of accounting for, and financing of, the GBE project, as described in detail in the Staff Information Systems Panel testimony. Under this traditional

method, the capital expenditure portion of the project is capitalized on the Service Company's books. A portion of these costs are allocated to Niagara Mohawk, which pays Service Company Rents encompassing its portion of the amortization expense of the project and the return on the unamortized balance. Additionally, the project's upfront operating costs are expensed when incurred and the appropriate allocation is charged to Niagara Mohawk as an O&M expense.

Q. Did the Company propose an alternative method of financing for GBE?

A. Yes. In the C&U Testimony of the Company's Revenue Requirements Panel, Niagara Mohawk proposed a third party financing option, or TPO, for GBE, wherein the Company would finance both the capital expenditures and the upfront operating expenses through an outside third party.

Q. How does the Service Company's utilization of a TPO effect the cost of this project?

A. There are two significant effects of the TPO on the overall costs of the project. First, the

Service Company would finance both the capital costs and the upfront operating expenses associated with the project. Therefore, rather than charge those operating expenses in the year in which they are incurred, the expenses would be spread over the life of the asset. Accordingly, interest would be not only be paid the capital expenditures, but on the operating expenses as well. Second, because the TPO will be financing the project, 100 percent with debt, Niagara Mohawk indicates that the cost to finance the project will be less than Niagara Mohawk's weighted average pre-tax cost of capital. Therefore, the Company asserts that use of the TPO will result in cost savings as opposed to financing, the project in the traditional manner.

Q. Why did the Company propose this TPO?

A. As stated on pages 35-36 of the C&U Testimony of the Revenue Requirements Panel, Niagara Mohawk declares that the TPO will result in lower total GBE costs on a net present value basis. Additionally, the Company states that the TPO would better align cost recovery of GBE with the

implementation of benefits and provide the operating companies an opportunity to recover the costs of this investment. Specifically, the Company asserts that the TPO would "support implementing GBE on a staggered schedule that best meets National Grid USA's business needs and mitigates execution risks, while at the same time eliminating any incentive to delay needed investments based on the timing of rate recovery."

Q. What are the cost reductions that the Company claims will be realized as a result of utilizing the TPO to finance GBE?

A. The Company estimates that total GBE financing costs to all of National Grid's US customers could be reduced by between $10 million and $35 million on a net present value basis. In addition to the lower financing costs, Niagara Mohawk also suggests that because the upfront operating expenses will be spread across multiple years, that the Company's revenue requirement could be reduced by more than $15 million over the Rate Year and two subsequent fiscal years, combined.

Q. Do you agree that the TPO will result in cost reductions?

A. We cannot make a determination at this time. In the response to IR DPS-688, Question 1, the Company provided a sensitivity analysis showing the estimated costs for Niagara Mohawk using the TPO versus the traditional method of financing. The Company estimates the net present value of the total GBE costs for Niagara Mohawk to be $72.4 million under the traditional method versus $65.4 million using the TPO. However, while this suggests a benefit to using the TPO, it is important to note that this analysis is predicated upon a certain set of interest rate assumptions. Whether or not actual net present value savings will be realized depends upon the terms of any financing agreement. Moreover, the differential between the options also depends on the pre-tax ROR authorized in these proceedings. As the Company is still in the early stages of assessing its financing options, we are unable to evaluate the accuracy of this analysis and therefore unable to determine if the TPO would actually result in cost reductions.

Q. Do you have any other concerns?
A. Yes, even if the TPO would result in an overall cost reduction for the GBE project, it is unclear how much of this reduction would result in savings to ratepayers versus shareholders.
Q. Please explain.
A. As previously stated, under the traditional method of financing and accounting for project costs, National Grid USA would have to expense the upfront operating costs when they are incurred. To the extent that another National Grid operating company is operating under a rate plan that did not reflect these costs in its forecast revenue requirement, that operating company would not be able to recover these operating expenses from ratepayers. However, by spreading these operating expenses over the life of the asset, as National Grid proposes to do with the TPO, that operating company would only be out the portion of operating expenses that had been amortized prior to its rates being reset. Therefore, for the period of time that an operating company is operating under a rate plan that did not forecast GBE, shareholders

would reap the benefit, in the form of reducing the amount of unrecoverable upfront operating expenses, most of which could be collected when the operating company's rates are reset.

Q. How is this relevant in these proceedings?

A. National Grid USA intends to roll out GBE not only to Niagara Mohawk, but also to KEDLI and KEDNY. KEDNY and KEDLI are currently operating under rate plans that do not incorporate any costs for GBE into their respective revenue requirements.

Q. What is your position on the Company's TPO proposal?

A. Based on the information provided, we cannot make a determination on the TPO at this time. As stated in response to IR DPS-602, question 3, the Company is "still in the early stages of determining the viability of financing options, products, and providers." Given this early stage, we do not know the specific details of the TPO that would determine whether there are cost reductions and/or ratepayer savings in this proposed financing arrangement. Additionally, we do not know the impact of this arrangement on

capitalization at the Parent Company level or how this arrangement would be perceived by the Company's outside auditors.

Q. Should the Commission set rates reflecting the use of a TPO to finance GBE?

A. We cannot recommend that at this time. We recommend that the Company provide additional details on its TPO proposal in its rebuttal testimony, including further support for the inputs in the cost reduction analysis, a more complete range of cost reduction scenarios and the Company's best estimate of the cost reduction, along with a thorough explanation for why each variable in the analysis is the Company's best estimate. Additionally, for each of the scenarios provided, the Company should also provide the amount of the cost reductions that would be retained by shareholders due to the timing of new rates or for any other reason, and the amount that would be realized by Niagara Mohawk ratepayers. Lastly, in addition to showing savings for Niagara Mohawk ratepayers, the Company should address whether or not the TPO would result in savings to New York State

ratepayers in totality. The Company should address the savings and associated rate impacts of utilizing the TPO on KEDNY and KEDLI customers as well.

Q. Is this rate proceeding the appropriate venue for determining the reasonableness of the TPO approach?

A. No. While the information we are requesting will aid the Commission in determining if the TPO provides benefits for all of National Grid's New York ratepayers, this issue should not be decided in the context of this rate proceeding.

Q. Why not?

A. As previously stated, the Company is rolling GBE out not only to Niagara Mohawk, but also to KEDNY and KEDLI. As such, the TPO will affect costs and rates at those utilities as well. If the Company intends to pursue this financing option, appropriate notice should be given so that parties in KEDNY and KEDLI, as well as Niagara Mohawk, can participate in the vetting of the TPO.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Cases 17-E-0238 and 17-G-0239

August 2017

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Prepared Testimony of:

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of gas audit Recommendation VI-2.

Q. Please continue.

A. As previously discussed, NMPC has not completed its implementation of gas audit Recommendations VII-1 and VII-2. Ms. Zavaglia's response to IR DPS-094 states that these recommendations are being addressed as part of the Company's Gas Business Enablement program. This program was not developed solely to address these Recommendations, but the Company anticipates that the program will satisfy the actions specified in Recommendations VII-1 and VII-2. Ms. Zavaglia explained that, for this reason, any costs related to these recommendations would be evaluated in the context of the broader Gas Business Enablement program. The Gas Business Enablement program is addressed by the Staff Gas Business Enablement Panel.

Q. Did the Company's response to IR DPS-094 provide other useful information?

A. Yes. The response states that no costs associated with either the electric audit or the affiliate audit are reflected in the Rate Year. Ms. Zavaglia also states on page 15 of her

A. No. As I noted earlier, the Approved Implementation Plan did not quantify potential savings and NMPC did not provide such estimate in its rate filing.

Q. Please explain gas audit Recommendations VII-1 and VII-2.

A. These recommendations propose enhancements to the Company's work management processes. Recommendation VII-1 directs the Company to "develop and implement...a program to track and manage crew and individual worker productivity." Recommendation VII-2 directs the Company to "develop a manpower planning program."

Q. What is the implementation status of NMPC's response to gas audit Recommendations VII-1 and VII-2?

A. NMPC accepted these recommendations in its approved implementation plan. The plan detailed a number of short-term improvements to the Company's work management systems and processes that were proposed in Recommendation VII-1. According to the plan, these improvements should have been implemented by approximately May 2017. The plan indicated that the implementation of

Recommendation VII-2 was contingent upon and would occur following the implementation of Recommendation VII-1. On November 1, 2016, NMPC proposed to extend the timeline to fully-implement the short-term solutions related to Recommendation VII-1 to October 2017. Staff reviewed evidence of NMPC's efforts to implement this Recommendation, and the extension request was subsequently approved by the Director of the Office of Accounting, Audits and Finance on February 1, 2017. The approved implementation plan indicated that a long-term solution was being explored as part of a potential new enterprise-wide, front-office system that would further enhance the Company's work management processes. This effort is part of the Company's proposed Gas Enablement Program, and is generally addressed by the Staff Gas Business Enablement Panel.

Q. Are there cost savings reflected in NMPC's Revenue Requirement as a result of implementing gas audit Recommendations VII-1 and VII-2?

A. No. NorthStar projected that the expected benefits of implementing this recommendation

would include improved work methods and processes, the ability to compare the efficiency of internal crews with outside contractors, and increased productivity which could result in labor savings or an increase in the amount of work performed. Because these recommendations are not yet fully implemented, it is not possible at this time to quantify what the labor savings might be.

Q. Did any of the consultants working on any of the audits project material savings during the Rate Year arising from NMPC's implementation of any other recommendation?

A. No. Neither the electric audit, the affiliate audit, the data audit, nor the staffing audit included potential savings projections or quantifications. In the gas audit, NorthStar's Customer Benefit Analyses did not include quantified anticipated savings for many recommendations. This was generally due to the nature of the recommendations. For example, the consultant made a number of recommendations related to the Boards of Directors of National Grid USA and its New York operating companies,

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In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Cases 17-E-0238 & 17-G-0239

August 2017

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Prepared Testimony of:

Staff Information Services Panel

Andrew Timbrook
Utility Engineer II

Aric Rider
Utility Supervisor

Keith Haugen
Utility Analyst 3 (Cyber Security)

Office of Electric, Gas & Water

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**Introductions and Qualifications**

Q. Please introduce the members of the Staff Information Services Panel.

A. The Panel members are Andrew Timbrook, Aric Rider, Allison Manz, and Keith Haugen.

Q. Mr. Timbrook, please state your name, employer, and business address.

A. My name is Andrew Timbrook. I am employed by the New York State Department of Public Service (Department) as a Utility Engineer II. My business address is Three Empire State Plaza, Albany, New York 12223.

Q. Mr. Timbrook, please briefly state your educational background and professional experience.

A. I received a Bachelor of Science Degree in Civil Engineering from the University of Pittsburgh in 2010. After graduating from the University of Pittsburgh, I worked for Hunt Engineers, Architects and Land Surveyors from 2011 to 2012, where my responsibilities included modeling municipal water systems and designing utility systems. In 2012, I joined the Gas and Water Rates Section of the Department as a Junior

Engineer. In my current role as Utility Engineer 2 in the Gas and Water Rates Section of the Office of Electric, Gas and Water, I work on gas and water rate cases filed by utilities.

Q. Have you previously testified before the New York State Public Service Commission?

A. Yes. I previously provided testimony in Case 13-W-0295, United Water New York, Inc., regarding non-revenue water (which I will refer to as “NRW”), sales and revenue forecast, the revenue reconciliation mechanism, and proposed tariff changes; Cases 13-W-0539, 13-W-0564, and 14-W-0006, United Water New Rochelle and United Water Westchester, regarding rate design, NRW, and proposed tariff changes; Case 14-G-0494, Orange and Rockland Utilities, Inc., regarding cost of service study, revenue allocation, and rate design; Case 16-W-0130, Suez Water New York, Inc., regarding rate design, NRW, and conservation; and in Case 16-W-0259, New York American Water Company, Inc., regarding revenue allocation and rate design.

Q. Mr. Rider, please state your name, employer, and business address.

A. My name is Aric Rider. I am employed by the Department and my business address is Three Empire State Plaza, Albany, New York 12223.
Q. Mr. Rider, in what capacity are you employed by the Department?
A. I am a Utility Supervisor in the Office of Electric Gas and Water, Gas and Water Rates Section.
Q. Mr. Rider, are your credentials contained in the Staff Policy Panel testimony?
A. Yes.
Q. Ms. Manz, please state your name, employer, and business address.
A. My name is Allison Manz. I am employed by the Department and my business address is Three Empire State Plaza, Albany, New York 12223.
Q. Ms. Manz, in what capacity are you employed by the Department?
A. I am a Supervisor in the Office of Accounting, Audits and Finance
Q. Ms. Manz, are your credentials contained in the Staff Policy Panel testimony?
A. Yes.
Q. Mr. Haugen, please state your name, employer,

and business address.

A. My name is Keith Haugen. I am employed by the Department as a Utility Analyst 3 – Cyber Security, assigned to the Utility Security Section within the Office of Electric, Gas and Water. My business address is Three Empire State Plaza, Albany, New York 12223.

Q. Please provide a summary of your educational and professional experience

A. I received a Bachelor of Science Degree in Information Technology from Empire State College. I am also certified as a Certified Information Systems Security Professional (CISSP) and a GIAC Systems and Network Auditor (GSNA). Beyond that, I have attended numerous courses and workshops on cyber security. My previous professional work experience consists of five years as a computer programmer for Newkirk Products, where I started as a junior programmer and worked my way up to senior programmer. I also became supervisor of my unit, overseeing the work of up to seven programmers of varying skill levels. For two years following Newkirk, I developed workflow

applications for Higher Education Systems Corporation as an IT Specialist 2.

Q. Please describe your current duties with the Utility Security Section.

A. I joined the Utility Security Section in 2008. My current responsibilities include conducting cyber security vulnerability assessments of critical facilities and corporate IT systems, which are owned and operated by the energy, gas, telecommunications, and water utilities.

Q. Have you previously testified before the Commission?

A. Yes. I testified on behalf of the Utility Security Section in Case 16-E-0060 and 16-G-0061, Consolidated Edison Company of New York, Inc.

**Summary of Testimony**

Q. What is the purpose of the Panel's testimony in this proceeding?

A. Our testimony will summarize Niagara Mohawk Power Corporation d/b/a National Grid's (Niagara Mohawk or Company) request for its new Information Services, or IS, programs and projects, discuss Staff's review process,

including the review of Cyber Security projects, recommend a number of adjustments related to the proposed IS projects, and make recommendations to improve the transparency of the Company's IS sanctioning and reporting processes going forward.

A. What adjustments are you recommending to the Company's proposed IS investments?

A. We recommend the following revenue requirement adjustments: (1) an adjustment to remove several projects from the Rate Year, or the twelve months ending March 31, 2019; (2) a slippage adjustment to capital expenditures and associated operating and run the business expenses; (3) an adjustment to operating expenses to reflect a normalized level of operating expenses as a percentage of capital spending; and (4) an adjustment to the National Grid USA Service Company (National Grid or Service Company) return on IS capital investments. We also will discuss unquantified savings arising from the IS investments that we provided to the Staff Policy Panel for its consideration on productivity. Finally, we

recommend a downward-only reconciliation of capital expenditures associated with Niagara Mohawk's Service Company Rent expense.

Q. In your testimony, will you refer to, or otherwise rely on, any information obtained during the discovery phase of this proceeding?

A. Yes. We rely on several responses provided by the Company to information requests, or IRs. These responses are included in Exhibit___(SISP-1), and will be identified using the reference number originally assigned by the Department. For instance, the Department's first IR was identified as "DPS-001."

Q. Is the Panel sponsoring any other exhibits?

A. Yes, we are sponsoring the following additional exhibits:

- Exhibit___(SISP-2), which presents National Grid's historic and projected IS capital budgets;
- Exhibit___(SISP-3), which presents schedules that support our recommended adjustments.

**The Company's Proposal**

Q. What is Information Services or IS?

A. According to pages 9 to 10 of the pre-filed direct testimony of the Company's Information Services (IS) Panel, IS "provides, maintains, and manages the computer hardware, computer software, cyber security, telecommunications and other relevant infrastructure, systems and services across all of National Grid's service territories." The Company explained that IS has three main categories of services – development/delivery services, which include identifying technology trends and developing technological solutions for the business; support and maintenance services, which provide ongoing support for business applications and infrastructure; and end user services, which include items such as desktop and e-mail services, communications media, and printer or fax support.

Q. Does Niagara Mohawk develop its own IS projects?

A. No. As the majority of IS projects are used by multiple operating companies subsidiary to the Service Company, IS projects are designed and accounted for by the Service Company. The associated project costs are allocated to the

appropriate operating companies using the various allocation factors shown in Exhibit___(ISP-1).

Q. Describe the Service Company's proposed IS platform investments.

A. The Service Company is planning a substantial investment in IS for its seven subsidiary operating companies in the Northeastern United States, including Niagara Mohawk. The Service Company forecasts incremental capital expenditures of $606 million from the start of the Rate Year through the end of fiscal year 2021 on various IS projects, which includes $286 million in the Rate Year. This compares to the most recent five year average of annual capital spending of $111 million. It also forecasts "run the business" (RTB) and operating expenses of approximately $350 million for all projects over the same period. This compares to $218 million of RTB and operating expenses in the historic test year, which is the twelve months ending December 31, 2016.

Q. Why is the Service Company making this investment in its operating companies?

A. The Company provides several reasons for the Service Company's investment plans. First, Niagara Mohawk argues that the average age of its IS platforms is advanced, with many platforms having outlasted their vendor support. In response to DPS-432 and DPS-704, the Company states that the average age of Niagara Mohawk's IS systems is 11 years, and the average age of IS systems across the Service Company and all operating companies is 12.3 years. Niagara Mohawk noted that, in contrast, the industry average age of IS systems is 5 to 7 years. The Company also states in its response to DPS-704 that 97 percent of 357 applications across the Service Company and its operating companies have at least one core component that no longer has vendor support, including all 14 applications that are used solely by Niagara Mohawk.

Second, the Company claims that a portion of the investments are needed to address mandates from the New York State Public Service Commission, or PSC, that require enhanced capabilities for customer service and operations platforms.

Third, the Company wants to improve its gas safety compliance performance and believes that the IS investments will assist in doing so.

Fourth, Niagara Mohawk advocates that IS investments are needed for enhanced customer service to meet evolving customer and business demands by improving data access and management and applications.

Fifth, the Company proposes a Human Resources Simplification Program, or HRSP, to improve its human resource systems, processes, and data.

Q. Are the IS investments divided into spending categories?

A. Yes. As shown in Exhibit___(RRP-3), Schedule 9, IS Investments are broken down into the following nine categories: Cyber Security, Physical Security, FY18 Plan, Growth Playbook, PSC Mandate, Other Mandates, Tech Modernization, Grid Modernization, and Gas Business Enablement or GBE.

**The Development of the IS Investment Plan**

Q. Describe the Service Company's proposed IS capital spending plan for the period FY 2019

through FY 2021.

A. As shown in Company Exhibit___(ISP-3), the proposed IS spending levels are $286 million, $205 million, and $115 million for fiscal years 2019 through 2021, respectively, for the Service Company.

Q. Describe the Company's corporate budgeting process.

A. In response to DPS-076, the Company described its corporate budgeting process. The Company states that the budgeting process begins each May, wherein IS capital budgets are developed, projects are prioritized, and estimates refined for the upcoming fiscal year, which begins the following April. In September, the associated operating expenses are developed by using historical spending trends and estimating the impact of any new projects. In November, the investment plan is submitted to the global and U.S. Chief Information Officer for approval. After implementation of the investment plan in the following April, the Company performs monthly reporting and tracking of projects and costs to provide spending oversight.

Q. Is the Company's corporate IS budgeting process similar to the process used by the electric and gas businesses?
A. Yes.
Q. Is the Company's corporate IS budgeting process appropriate?
A. Yes, the process is appropriate.
Q. How does the Company estimate its Rate Year budget for the proposed IS investments?
A. The Company's proposed Rate Year budget is composed of individual project budgets in each budget category.
Q. Describe the typical life cycle of an IS project and how the individual project budgets are developed.
A. In a technical session the Company explained the five stages of an IS project life cycle: pre start-up, start-up, requirements and design, development and implementation, and close.
Q. Describe each life cycle phase.
A. The pre start-up phase frames the problem and begins to develop scope, context, and cost estimates for a solution. The information gathered in the pre start-up phase is

incorporated into the Investment Request Summary, or IRS, which considers the cost estimate of the project to have a plus 200 percent or minus 50 percent accuracy. The project then moves to the start-up phase, where a project manager is assigned and a work plan is developed. The assigned team refines the project estimates to an accuracy of plus or minus 25 percent and develops a partial sanction. After the partial sanction is approved, the project moves to the requirements and design phase where the team works with the business requesting the solution to refine the user and technical requirements. Designs ensue and solutions are selected with estimated costs of plus or minus ten percent. The IS team incorporates their work into a sanction paper and it is sent for approval following the corporate guidelines previously mentioned. Next, the IS team builds the solution and tests that it operates as required and designed in the development and implementation phase. The solution is implemented and the transition begins with necessary support provided.

Finally, a closure paper is developed to ensure a clearly documented conclusion to the project activity.

Q. Did you, or members of Staff under your supervision, conduct a review of projects in each budget category?

A. Yes. A sampling of projects was examined to determine the need, timing, scope, and cost of each project reviewed. In the response to DPS-275, IRS or sanction papers were provided for each project, depending on the current stage of project development.

Q. Describe the project sanctioning process.

A. The sanctioning process identifies the appropriate spending levels, by specific programs or projects. It is the process used to seek and obtain approval to spend money on project development. The sanction request may address the full project cost, or a partial sanction may be submitted to request sufficient funding to advance a larger project to the next stage of development.

Q. What types of sanctions does the Company employ for IS capital programs or projects?

A. There are four types of sanctions: partial sanctions, sanction papers, re-sanctions, and a closure paper. A partial sanction paper is generally submitted to advance a project when a sanction paper cannot be submitted due to a lack of complete scope and final cost. A sanction paper is prepared for the full scope and cost of the project and is considered the final approval to undertake the project. A re-sanction must be filed within 60 days of notification that the cost of a project is forecast to vary outside of the tolerance approved in the sanction paper. A closure paper is prepared at the completion of a project that details the final objectives and outcomes of the project.

Q. What information is contained in the sanction papers?

A. Generally, sanction papers provide cost and project details, as well as potential alternatives and the ramifications of those alternatives, so that the Company can make informed decisions regarding capital projects, including the risks and benefits to the Company and its customers. More specifically, the

sanction paper includes a summary of the amount being requested for sanctioning, broken down into capital and operating expenditures by year, and a brief description of the project, including what is being proposed, what is being replaced, drivers, background, benefits, and any business or customer issues. As some sanctions can be done for multiple projects, a summary of projects is listed. The prior sanctioning history shows each partial or prior sanction before the current sanction paper, along with the sanctioned amount, the next planned sanction, all key milestones, and the cost estimation tolerance around the sanction requested amount. Each sanction paper categorizes the project as mandatory, policy-driven, justified net present value or other.

Q. Please continue.

A. Each sanction paper also defines an asset management risk score, risk driver, complexity level, and hazard assessment. The resources to complete the project, whether internal or external, availability of those resources, and any potential operational impact are also noted.

The project alternatives that were considered are listed, along with potential risks faced in project implementation. Any cost assumptions and cost benefit analysis or net present value analysis performed are listed, or marked not applicable. The recovery of the project costs and financial impact to the Service Company are defined. If a fully developed sanction is completed, there will be an estimate of expected implementation operating costs and ongoing run the business expenses. Finally, a list of operating companies that will benefit from - and pay for - the project is included, with a plan for customer outreach, if applicable.

Q. Do all papers in the sanctioning process include all of the information you described?

A. No. Depending on the status of a project’s development, it may be in different stages of sanctioning and only preliminary information is included in the documentation.

Q. What information is contained in the IRS papers?

A. The IRS shows the key personnel involved in developing the project, as well as the project category, primary policy driver, description and

background, expected benefits, scope, dependencies, and assumptions. Estimated costs by year are listed, as well as costs by delivery phase. A breakdown of the project prioritization and cost by capital, operating, and expected run the business costs is included, along with a score for investment risk and complexity. An estimate of the resources needed to complete the project, the key, known milestone dates, and benefitting operating companies are also listed.

Q. Why is less information available in the IRS papers?

A. IRS papers may contain less information, or more broadly defined information, than full sanction papers because, as described previously, these are used at the earliest stage of project development.

**IS Investment Recovery**

Q. How do the Service Company IS expenditures impact the Niagara Mohawk revenue requirement?

A. As previously mentioned, IS project costs are incurred at the Service Company level. The costs are then allocated to the individual

operating companies that use the IS services. Niagara Mohawk thus is allocated its proportionate share of IS project costs for each solution it utilizes that was developed or obtained by the Service Company.

Q. What types of IS costs are allocated to Niagara Mohawk?

A. The Company divides its IS program costs into three categories: capital expenditures, operating expenses, and “run the business,” or RTB, expenses.

Q. Please describe the capital expenditures category.

A. Capital expenditures represent the costs to buy or create the project that will be included as an asset at the Service Company. Exhibit___(ISP-3) shows the forecast capital expenditures, by project, for the Rate Year, as well as for fiscal years ending March 31, 2020 and March 31, 2021. This Exhibit lists over 330 IS projects, or modules, with Service Company capital expenditures totaling $285.927 million in the Rate Year.

Q. How do these capital expenditures translate to

the Company's Rate Year revenue requirement?

A. Once the project is closed to plant in service on the Service Company's books, the Service Company begins to charge Niagara Mohawk for its portion of the amortization expense of the project, as well as a return on the unamortized project costs. This process is similar to that used for "traditional" electric and gas plant, whereby the Company incurs depreciation expense and also earns a return on the net book value when the plant is included in rate base.

Q. Do the IS assets move to the Company's books after being placed in service?

A. No. These assets remain on the Service Company's books after Niagara Mohawk begins using them. The Service Company recovers both the return on and the return of the IS asset investment through Service Company Rent expense, which is a component of Operations and Maintenance expense, or O&M. Service Company Rent expense is shown in the Company's Exhibit___(RRP-3), Schedule 9.

Q. How much Service Company Rent expense does the Company forecast incurring during the Rate Year?

A. The Company forecasts $41.226 million and $9.172 million of Rate Year Service Company Rent expense for its electric and gas businesses, respectively. Of this amount, $25.725 million and $4.645 million is for existing electric and gas projects, respectively, and $15.501 million and $4.526 million is for new electric and gas IS projects, respectively.

Q. Please describe the IS operating expenses.

A. As described on pages 50 to 51 of the IS Panel's Direct Testimony, operating expenses are the upfront costs associated with the start-up and application development phase of the IS projects. These costs are spread throughout multiple components of the revenue requirement.

Q. How are operating expenses incurred in the historic test year reflected in the Rate Year revenue requirement?

A. As shown in Exhibit___(ISP-8), the Service Company incurred operating costs of approximately $11.8 million in the historic test year. The Company refers to these operating expenses as "IS Base" and these expenses are spread throughout a number of cost components,

including labor and other expense. The Company expects the level of operating expenses incurred in the historic test year to continue in the Rate Year. After accounting for inflation and allocations to Niagara Mohawk, the various components of the Rate Year revenue requirement include approximately $2.956 million and $0.567 million of these expenses for the electric and gas businesses, respectively.

Q. What level of operating expenses associated with new IS projects are forecast to be incurred during the Rate Year?

A. As shown in Exhibit___(ISP-7), the Service Company expects to incur an additional $26.279 million of operating expenses in the Rate Year associated with new IS projects, not including the GBE and Grid Modernization initiatives. After allocation to Niagara Mohawk, these forecast costs result in incremental Rate Year expenses of $4.156 million and $0.797 million for electric and gas operations, respectively. These expenses are included in the Other Initiatives expense line in O&M, as shown in Exhibit___(RRP-3CU), Schedule 27. Additionally,

the calculation is shown in Exhibit___(SISP-3).

Q. Does the Rate Year revenue requirement reflect upfront operating expenses for GBE and Grid Modernization?

A. Yes. The Company included electric and gas operating expenses of $0.198 million and $9.631 million, respectively, to implement GBE. The Company also included $16.210 million and $0.028 million of upfront Grid Modernization expenses for electric and gas, respectively, as shown in the Company's response to DPS-607. These expenses are included in the Other Initiatives expense line in O&M, as shown in Exhibit___(RRP-3CU), Schedule 27.

Q. Please describe the IS RTB expenses.

A. As explained on pages 50 to 51 of the Company's IS Panel Direct Testimony, RTB expenses are on-going costs incurred to operate and maintain the applications, including licensing fees. Similar to the upfront operating expenses, run the business expenses are included in many areas of the revenue requirement.

Q. How are run the business expenses incurred in the historic test year reflected in the Rate

Year revenue requirement?

A. As shown in Exhibit___(ISP-8), the Service Company incurred approximately $206.1 million of run the business costs in the historic test year. These costs are referred to as "Operational Costs" and are spread throughout multiple cost components, including labor and other expense. The Company expects the level of RTB expenses incurred in the historic test year to continue in the Rate Year. After accounting for inflation and allocations to Niagara Mohawk, the various components of the Rate Year revenue requirement that include these Operational Costs total approximately $51.633 million and $9.907 million for the electric and gas businesses, respectively.

Q. What level of RTB expenses will be incurred during the Rate Year for new IS projects?

A. As shown in Exhibit___(ISP-7), the Service Company expects to incur an additional $16.455 million of run the business expenses in the Rate Year associated with new IS projects, not including GBE and Grid Modernization. After allocation to Niagara Mohawk, this results in

incremental Rate Year RTB expenses of $2.602 million and $0.499 million to electric and gas operations, respectively. These costs are included in the Other Initiatives expense line in O&M, as shown in Exhibit___(RRP-3CU), Schedule 27. Additionally, the calculation is shown in Exhibit___(SISP-3).

Q. Does the Rate Year revenue requirement reflect RTB expenses for GBE and Grid Modernization?

A. Yes. The Company included gas run the business expenses of $1.200 million for GBE, and electric RTB expenses of $3.640 million for Grid Modernization. These expenses are included in the Other Initiatives expense line in O&M, as shown in Exhibit___(RRP-3CU), Schedule 27.

Q. Please summarize the Company’s Rate Year revenue requirement as it relates to IS projects.

A. The Company has included approximately $122.622 million and $31.801 million of IS-related costs in the revenue requirements for its electric and gas businesses, respectively. This is comprised of electric and gas capital-related costs of $41.226 million and $9.171 million, respectively, which are incurred as Service

Company Rent expenses; upfront electric and gas operating expenses of $23.520 million and $11.024 million, respectively; and $57.875 million and $11.606 million of electric and gas RTB expenses, respectively.

Q. How much of this revenue requirement is incremental to what was included in the historic test year and associated with new IS projects?

A. Of the amounts previously provided, approximately $42.307 million and $16.682 million is incremental. This is comprised of incremental Service Company Rent expense of $15.501 million and $4.526 million, upfront operating expenses of $20.564 million and $10.457 million and RTB expenses of $6.242 million and $1.699 million for electric and gas operations, respectively.

**Staff Review Process**

Q. Describe the process you used to review the Company's existing IS investments.

A. For existing IS projects, where the costs have already been incurred prior to the beginning of the Rate Year, we selected a sample of projects and reviewed the associated sanction papers, the

capital costs incurred, and the amortization period and bill pool used in calculating Niagara Mohawk's Service Company Rent expense.

Q. Describe the process you used to review the Company's proposed IS investments.

A. For the proposed new IS projects, which result in the incremental costs discussed above, we performed a more thorough, multi-pronged review. We held several technical sessions with the Company to discuss its budgeting process, proposed IS investment plan, and the cost estimation and implementation planning process. We also discussed the goals and objectives of the IS investments. Next, we reviewed the Service Company's historic IS capital spending from Fiscal Year 2013 to Fiscal Year 2017 to gauge its ability to complete IS projects. This included evaluation of estimated and actual project costs. Finally, we reviewed the proposed IS projects and associated expenses. This review included an examination of the documents used to address issues, or Investment Request Summaries and sanction papers, the process used to select the individual project

and to sanction spending on the projects, and the estimated project costs and savings. Later in our testimony, we compare and contrast this process with our review of electric and gas investment plans, and propose measures needed to align the review processes of all three asset classes.

Q. What approvals are needed before a IS project may proceed?

A. Like traditional electric and gas projects, specific delegation of authority approval must be obtained before any IS project can proceed. The delegation of authority approval process includes the review of sanctioning documentation for IS capital projects. The IS sanction process follows the standard US Sanctioning process for electric and gas projects, wherein all IS projects valued over $1 million (for both capital expenditures and operating expenditures, combined) must be approved by the US Sanctioning Committee. Projects under the $1 million threshold are approved by the IS Sanctioning Committee.

Q. Did you also review the Service Company’s IS

budgeting process?

A. Yes. As explained in the Company's response to DPS-076, the same corporate process and timeline that is employed for electric and gas capital investments is used for IS investments.

**Historic Review**

Q. What did you observe when you reviewed the historic IS capital spending?

A. We made several observations. First, the Company reports on each of its IS projects or modules by month for each of the periods reviewed. Second, the actual IS capital spending levels in fiscal years (FY) 2013 through 2017 were $149 million, $75 million, $85 million, $94 million, and $153 million, respectively. Lastly, we observed that there are significant variances between the Company's capital budgets and the amount expended in any given year.

Q. Please explain the actual to budget variances you noted in your review.

A. As shown in Exhibit___(SISP-2), which was developed using the Company's response to DPS-077, there was a significant variance in actual

to budgeted spending in each of the last five fiscal years, FYs 2013 through 2016. In each of those years, the Company underspent its annual budget by an average of $42 million, or 28 percent. The most significant underspend was in FY 2014, when the Company underspent its $167 million budget by $92 million, or 55 percent. More recently, however, the Company has exceeded its budget. In FY 2017, the Company reports that it significantly exceeded its budget, with spending of $153 million, or 69 percent, over its budget of $91 million. However, $73 million, or 48 percent, of the FY 2017 overspend was incurred in March, which is the last month of the fiscal year. We will address this abnormality later in our testimony.

Q. What is your opinion of the Company's proposed IS capital budgets considering its historic IS spending performance?

A. Despite historical IS budgets being significantly lower than the proposed Rate Year IS budget of $286 million, the Company has consistently under-spent on IS by a large margin. As such, we have serious concerns that

the Company can deliver on its proposal to spend the projected Rate Year IS budget of $286 million.

**Cyber Security**

Q. What is cyber security?

A. The field of cyber security addresses unwanted intrusions into electronic systems. It is one in which the risks, threat actors/vectors, and technologies involved are constantly changing and increasing in complexity at a breakneck pace. National Grid's network and supporting electronic devices are components of the utility's critical energy infrastructure, and we anticipate that probes and surveillance of these assets will continue, and probably increase in frequency and sophistication.

Q. Please summarize Company proposals regarding cyber security.

A. As detailed in Exhibit___(ISP-5), the Service Company plans to complete six cyber security-related projects in the Rate Year and eight such projects in the subsequent two fiscal years. The Service Company reports that it also will place many cyber security programs in service

during the bridge period between the historic test year and the Rate Year. According to the Company, these projects will address a wide range of cyber security issues that include protecting utility networks and systems in real time, supporting critical reliability functions, strengthening capabilities to ensure that access and functions are available only to authorized utility personnel, and modernizing the utility's cyber security framework.

Q. What cyber security costs does the Service Company project to incur during the Rate Year?

A. The Service Company projects to incur $7.9 million in capital expenditures, $1.6 million in operating expenses, and $5.3 million in RTB for the Rate Year, as detailed in Exhibit___(ISP-3) and Exhibit__(ISP-7).

Q. Does the Panel agree that these investments are needed to meet a growing security threat?

A. Yes. These investments reflect the growing importance of ensuring adequate cyber security for utility systems and software. Such threats are real, and could have significant, widespread consequences if successful. In 2016, for

instance, National Grid was advised by American and British governmental agencies of a real threat of a malicious cyber-attack against its energy networks. The implementation of cyber security countermeasures is essential to establish a high level of monitoring and protection against these threats. We agree that the proposed investments in this area are reasonable.

Q. Does the Panel have any further recommendations relevant to the Company's cyber security investments?

A. Yes. We are recommending adjustments to the Company's total IS budget for the Rate Year. The adjustments are necessary to align the Company's planned spending level with the volume of work that it reasonably may be able to complete during the Rate Year. As always, it is the Company's responsibility to manage, prioritize, and sequence project investments to provide safe and adequate service. Given this discretion and flexibility, and in consideration of the fact that the proposed cyber security investments are modest in scope but critical to

safeguarding the Company's systems, we recommend that the Company prioritize the cyber security investments to ensure that they are completed during the Rate Year as proposed.

**Staff Adjustments**

*Analysis of specific projects*

Q. Please explain the adjustments pertaining to the specific projects that Staff recommends be removed from the Rate Year.

A. Staff has made adjustments to remove a number of discrete projects from the Rate Year revenue requirement. The Staff AMI Panel will discuss adjustments related to AMI projects. The Staff Electric Infrastructure and Operations Panel will discuss adjustments related to the Distributed Generation Interconnection Online Application Portal, or DGIOAP (INVP #4704F), Load and DER Forecasting (INVP #4729), and the System Control and Data Acquisition, (D-SCADA) projects (INVP # 4704G). The Staff Consumer Services Panel will address the Customer Bill Redesign project (INVP #4704Q).

Q. What adjustments are you recommending to account for the Staff proposals to remove these specific

projects from the revenue requirements?

A. Our adjustments reduce the Rate Year Service Company IS capital expenditures by $35.075 million. This brings the Company's proposed spending level of $286 million down to $251 million. It also results in the following Rate Year revenue requirement adjustments: a reduction to IS Service Company Rent expense for the electric and gas businesses by $1.361 million and $0.506 million, respectively; upfront electric and gas operating expenses by $6.308 million and $0.013 million, respectively; and ongoing run the business costs by $0.977 million and $0.006 million for the electric and gas businesses, respectively. The reductions in operating and run the business expenses are reflected in the Other Initiatives expense line item. These calculations are shown in Exhibit___(SISP-3).

*Slippage*

Q. What is slippage?

A. Slippage is essentially a variance. It represents the difference between forecast expenditures and actual work completed.

Slippage can be a result of not completing work when expected, or completing the work at a different cost than originally forecast.

Q. What is a slippage adjustment?

A A slippage adjustment reflects a decrease to Rate Year capital expenditures based on the review of past spending variances.

Q. Has the Commission previously utilized slippage adjustments to establish a forecast of traditional electric and gas capital expenditures?

A. Yes. In the past, the Commission has utilized slippage adjustments to establish a rate year forecast of capital spending. However, the capital reporting and review process has been improved over the years to the point where companies regularly report to Staff and the Commission, and, in rate proceedings, Staff reviews every major capital project and program that companies include in rate cases. Based on that current process, Staff may recommend specific adjustments be made due to the need, timing, and/or cost of individual projects. Additionally, Staff meets with companies between

rate cases, on a quarterly basis, to go over project changes, variance reporting, and any new projects that the companies claim to be needed. This comprehensive level of review and monitoring significantly reduces the need for a general slippage adjustment.

Q. Why is a slippage adjustment appropriate in this case?

A. The project-specific review and real-time monitoring process we described above has been applied primarily to capital investment plans for electric and gas assets. A comparable process for IS investments, however, needs to be developed. Later in our testimony, we recommend that the Company implement a specific process to align the planning and review of its IS capital investments with the planning and review of its more traditional electric and gas capital investments, but it will take some time for that effort to mature. An interim measure is needed to protect customers from unreasonable or inaccurate rate year forecasting which may occur due to the combined effects of an unclear estimating process and a significant increase in

capital spending that may not be achievable. Under these circumstances, the more general slippage adjustment would serve as a stop-gap measure that provides critical protection for customers while a more comprehensive review and monitoring system is put in place for the Company's IS investments.

Q. What slippage adjustment do you recommend?

A. We recommend that a 37 percent slippage adjustment be applied to the Company's Rate Year IS spending levels that are reflected in the revenue requirement. This adjustment was based on a historical multi-year average of actual-to-budget spending for IS projects.

Q. How did you calculate the 37 percent adjustment?

A. As previously discussed, the Company provided in response to DPS-077 its actual and budgeted monthly spending, at the Service Company level, for all IS projects for fiscal years 2013 to 2017. After reviewing this information, we found that fiscal years 2013 and 2017 are outliers and should be removed for the purpose of determining a historical annual average level of variance.

Q. Why did you conclude that fiscal year 2013 is an outlier that should be excluded from the multi-year average?

A. The Staff GBE Panel explains in its testimony that the Service Company's U.S. Foundation Project, or USFP, which was implemented in 2012, was an unusual project in terms of its size and overall scope. The USFP was intended to replace and integrate multiple systems and processes across National Grid's operating companies. These systems included Human Resources, supply chain, finance, customer master data, non-utility billing, supplier self-service, business information warehouse, and business objects planning and consolidation. The USFP also was unusual in that significant problems occurred during implementation, including payroll processing and supply chain issues. A large portion of the USFP costs occurred in fiscal year 2013, which ended March 31, 2013. Projects of the scope and cost of USFP are not common and, therefore, the costs associated with it are not representative of spending in a typical year. For these reasons, we excluded fiscal

year 2013 data from our multi-year average.

Q. What USFP costs were included in the fiscal year 2013 data?

A. The Company's response to DPS-077 indicates that the USFP – included in the responsive information as project 2547, "USFP-PMO" - had actual capital spending of $64.5 million in FY 2013. This represented 43 percent of the $149 million actually spent in this year. The fact that one project accounted for almost half of the annual spending reinforced our decision to treat this fiscal year as an outlier for purposes of the multi-year average.

Q. Why did you conclude that fiscal year 2017 also is an outlier?

A. As shown in the Company's response to DPS-077, fiscal year 2017 had an IS budget of $90.725 million but actual spending of $153.257 million. That is, in fiscal year 2017, National Grid exceeded its IS budget by $62.531 million, or 69 percent. Significantly, however, the Company's data show that $73.610 million, or 48 percent, of the actual fiscal year 2017 spending was incurred in March, which is the last month of

the fiscal year.

Q. Why are the costs incurred in March 2017 so high?

A. We do not know. However, when looking at the data, the costs incurred in March dramatically exceed the costs incurred in any other month of the fiscal year. The Company's response to DPS-077 shows monthly spending from December 2016 through March 2017 of $8.286 million, $18.990 million, $12.854 million, and $73.610 million. Additionally, monthly spending from April 2017 through July 2017 was $14.606 million, negative $6.156 million, $7.119 million, and $4.156 million. Spending in March 2017 thus exceeded the next-highest monthly spending level of $18.990, incurred in January 2017, by $54.62 million, or almost 288 percent.

Q. Did you examine monthly spending in other years to determine whether there is a pattern of costs spiking in March?

A. We did, and there is no obvious historic parallel. Although the charges incurred in March typically were higher than the costs incurred in other months, the costs incurred in

March from 2014 through 2016 were $16.345 million, $9.252 million, and $10.964 million, respectively; all well below the $73.610 million spent in March 2017. On a percentage basis, spending in the month of March in years prior to 2017 accounted for 22 percent of the expenditures in 2014, 11 percent of annual expenditures in 2015, and 12 percent of annual expenditures in 2016. None of these monthly totals, on a dollar or percentage basis, come close to the charges incurred in March 2017.

Q. Are you saying that the capital costs the Company claims were incurred in March 2017 should be disallowed?

A. No. Our point is that, due to the significant abnormality of these monthly costs, the data for fiscal year 2017 should be excluded from the inputs for determining a multi-year average slippage adjustment.

Q. How did you calculate the historic slippage adjustment?

A. After removing these outliers, and focusing on fiscal years 2014 through 2016 to provide recent historic data, we compared the budgeted and

actual spending for these fiscal years. We determined that, on average, the Service Company historically spent approximately 37 percent less than its budget on an annual basis.

Q. Please specify the IS revenue requirement components to which you applied this slippage adjustment.

A. We applied the slippage adjustment to Service Company Rent expense, upfront operating expenses associated with GBE and Grid Modernization projects, and ongoing run the business expenses.

Q. How did you calculate the slippage adjustment for the Service Company Rent expense?

A. We started with the Service Company Rent expense, net of the adjustments for individual projects previously discussed, of $14.140 million and $4.020 million for electric and gas, respectively. We then reduced these amounts by 37 percent. The adjustment reduces the electric and gas Service Company Rent expenses by $5.175 million and $1.471 million, respectively. These adjustments are shown in Exhibit___(SISP-3).

Q. How did you calculate the slippage adjustment for the GBE and Grid Modernization upfront

operating expenses?

A. We started with electric and gas GBE operating expenses of $0.198 million and $9.631 million, respectively, and Grid Modernization operating expenses of $9.939 million and $0.029 million for electric and gas, respectively, all net of the adjustments for the individual projects previously discussed. We next reduced these amounts by 37 percent. The adjustment reduces the electric and gas operating expenses by $3.710 million and $3.535 million, respectively. These adjustments are included in Other Initiatives expense and shown in Exhibit___(SISP-3).

Q. Why did you apply the slippage adjustment only to upfront operating expenses associated with GBE and Grid Modernization?

A. We are making a separate adjustment to the upfront operating expenses of the remaining projects, which we will discuss later in our testimony.

Q. How did you calculate your slippage adjustment for the ongoing run the business expense?

A. We started with run the business expenses of

$5.265 million and $1.694 million for electric and gas respectively, net of individual project adjustments previously discussed. We next reduced these amounts by 37 percent. The adjustment reduces the electric and gas run the business expenses by $1.927 million and $0.620 million, respectively. These adjustments are included in Other Initiatives expense and shown in Exhibit___(SISP-3).

*Upfront operating expenses*

Q. Please explain your adjustment to upfront operating expenses.

A. Our adjustment reduces upfront operating expenses for all IS projects, excluding GBE and Grid Modernization projects, by $3.550 million and $0.681 million for the electric and gas businesses, respectively.

Q. How did you calculate your adjustment?

A. We began with our total recommended allowed capital budget of $159.052 million, which is net of the individual project adjustments and slippage adjustment previously discussed. We then removed GBE and Grid Modernization capital costs, net of their slippage adjustment, to

arrive at a net allowed Service Company capital budget of $67.154 million for all projects other than those related to GBE and Grid Modernization.

Q. Why did you remove GBE capital costs?

A. GBE represents different types of projects than have typically been undertaken. GBE is a stand-alone project to replace and consolidate the gas businesses' IS systems. Therefore, the project has significant upfront operating expenses associated with implementation, data transition, and training that would not compare to historic IS operating expense levels. For this reason, historic data is not representative of potential Rate Year spending and does not provide an appropriate basis for the allowed upfront operating expenses for these projects.

Q. Why did you remove Grid Modernization capital costs?

A. Grid modernization projects reflect a significant increase in the Company's requirement to meet real-time data needs as the Company transitions from serving as a traditional utility to serving as the

Distributed System Platform. This transition likely will result in higher upfront operating expenses. Therefore, similar to GBE, historic data is not representative of potential Rate Year spending and does not provide an appropriate basis for the allowed upfront operating expenses for these projects.

Q. Please continue.

A. Given the unique circumstances associated with the GBE and Grid Modernization projects, we only applied the slippage adjustment to the operating expenses for these projects, as previously discussed.

Q. Please continue with the explanation of your adjustment.

A. Based on data provided in the Company's response to DPS-631, we calculated a three-year average operating expense-to-capital expenditures ratio of 17 percent. We applied this ratio to the net allowed capital expenditures of $67.154 million to arrive at a Rate Year forecast of operating expenses at the Service Company level of $11.216 million for projects other than GBE and Grid Modernization. We next compared this amount to

the Company's request of $26.089 million, as shown in Exhibit___(ISP-7), less the operating expense costs associated with the Customer Bill Redesign project, which indicated a reduction of $14.873 million at the Service Company level. Applying the Niagara Mohawk allocation rates of 23.87 percent and 4.58 percent for the electric and gas businesses, respectively, as shown in Exhibit___(ISP-8), we derived operating expense adjustments of $3.550 million for electric operations, and $0.681 million for gas operations. These adjustments are included in Other Initiatives expense and shown in Exhibit___(SISP-3).

Q. Why did you base the upfront operating expense allowances on a historic percentage of capital costs, rather than simply applying the slippage adjustment to the Company's total request?

A. As shown in Exhibit___(SISP-3) and supported by the Company's response to DPS-631, for the years 2013, 2014, 2015, and 2016, the Company incurred operating expenses that were 7 percent, 12 percent, 19 percent, and 20 percent of total capital expenditures, respectively. However,

the Company requested total Service Company operating expenses of $26.279 million in the Rate Year for IS projects, exclusive of GBE and Grid Modernization. This request represents 25 percent of the $106.914 million in capital expenditures incurred for the same projects during that time period. Given the nature of GBE and Grid Modernization, it might be reasonable for future operating expenses to exceed historic costs. However, for all remaining projects, we are not aware of any reason why operating costs should exceed historic expenses by a significant margin. As such, we based our Rate Year forecast of upfront operating expenses on this historic data.

*Service Company Asset Recovery Charge*

Q. What rate of return did the Company request to apply to the unamortized IS capital costs in the Rate Year?

A. The Company proposed to use a pre-tax weighted average cost of capital of 9.91 percent, which is based on a Return on Equity, or ROE, of 9.79 percent with a capital structure comprised of 50 percent common equity and 50 percent long-term

debt. This is shown on pages 19 to 20 of Company witness Joshua Nowak's Direct Testimony.

Q. Do you agree with Mr. Nowak's proposal to use the Service Company rate of return, which includes a 50 percent common equity ratio?

A. No. We understand that the Staff Finance Panel is recommending for Niagara Mohawk a common equity ratio of 48 percent and a return on equity of 8.25 percent. Accordingly, we recommend that the common equity ratio and cost rates for common equity and long-term debt proposed by the Staff Finance Panel also should be used in the development of revenue requirement for Service Company Rent expense. This would result in a pre-tax weighted average cost of capital of 8.74 percent, which is consistent with the stand-alone Niagara Mohawk rate of return, as shown on Exhibit___(FP-19). We recommend that this rate be applied to assets at the Service Company level so as to avoid imposing unreasonably inflated costs on customers.

Q. What is your adjustment for this reduction in the use of the stand-alone Niagara Mohawk rate

of return?

A. This adjustment reduces electric and gas Service Company Rent expense by $1.044 million and $0.238 million, respectively.

*Adjustments Summary*

Q. Please summarize your revenue requirement adjustments related to IS projects.

A. Our revenue requirement adjustments decrease, for electric and gas operations, respectively, Service Company Rent expense by $7.580 million and $2.215 million; upfront operating expenses, which are included in Other Initiatives expense, by $13.567 million and $4.230 million; and RTB expenses, which are also a component of Other Initiatives expense, by $2.904 million and $0.625 million.

**IS Savings**

Q. Did the Company forecast savings associated with IS expenditures in the Rate Year?

A. According to Exhibit___(ISP-7), the Company projects that five IS projects will yield savings in the Rate Year. These savings total $4.063 million at the Service Company level, not including any potential savings from GBE. As

shown in Exhibit___(ISP-8), the Company allocated to Niagara Mohawk 23.87 percent of these savings for electric operations, which equates to $0.970 million, and 4.58 percent for gas operations, which equates to $0.186 million. Additionally, as discussed in the Staff Gas Business Enablement testimony, the Company has forecast Rate Year GBE savings of $0.007 million for gas operations. In total, Niagara Mohawk projects that it will realize savings of $0.970 million and $0.193 million for its electric and gas businesses, respectively.

Q. Is it your opinion that this estimate accurately captures potential Rate Year savings associated with increased spending on IS projects?

A. No. This level of savings seems exceptionally low, particularly given the significant increase in IS investments.

Q. Did you ask the Company if there were additional savings expected or reflected in the revenue requirement?

A. Yes, we asked this question multiple times. In DPS-666, Staff asked the Company to provide the amount of savings expected for each project

listed in Exhibit___(ISP-3). In response, the Company stated that only the five projects identified in Exhibit___(ISP-7), and noted above, might yield Rate Year savings.

In DPS-607, Staff asked the Company to provide the amount of savings included in the revenue requirements for each Grid Modernization project. The Company responded that "there are no specific savings associated with these projects."

In DPS-513, Staff asked if the Company had forecast any savings associated with IS projects in the Other Mandates category. The Company responded that "[t]here may be some efficiencies gained from delivery of these projects, but they are often minimal and are not typically quantified because the primary driver for undertaking these projects is to comply with the required mandate."

In DPS-562, Staff asked if the Company had forecast any savings associated with IS projects in the PSC Mandates category. The Company responded that there were no forecast savings as "PSC mandated projects are primarily undertaken

to ensure compliance with a regulatory order rather than to generate savings. While there may be some efficiencies gained, they are typically qualitative rather than quantitative."

In DPS-605, Staff asked for all savings, by project, that were included in the incremental IS operating expenses and run the business costs that are reflected in Other Initiative expense. The Company again referred to the five projects identified in Exhibit___(ISP-7) as the only projects that yield savings.

In DPS-430, Staff questioned the Company about savings associated with GBE. In response, the Company again showed only $0.007 million in GBE-related savings in the Rate Year.

Q. Did the Company explain why its IS investments would not yield additional savings?

A. The Company has stated that many of these projects were not undertaken to achieve savings. Rather, these projects were implemented to comply with regulatory mandates, achieve policy goals, protect Company systems from unauthorized access, or to enable the Company to offer new products and services. The Company stated that

it does not expect to realize savings from projects that address these goals. Additionally, the Company has stated that some projects will achieve savings, but these savings will not be achieved until after the Rate Year.

Q. Do you agree with this explanation?

A. Partially. First, we recognize that some projects, such as those associated with cyber security, are done to minimize risk and may not yield savings. However, for many of these projects, savings or efficiencies should occur even if the primary purpose is something other than cost reduction. Second, we share the Company's expectation that there will be projects that will yield savings after the Rate Year. We note, however, that 126 of the projects listed in Exhibit __(ISP-3), excluding GBE, have in service dates prior to the beginning of the Rate Year. Of these 126 projects, 15 are physical or cyber security and the remaining 111 are mandated, FY18 plan, Grid Modernization or Tech Modernization. As such, it is reasonable to expect savings during the Rate Year period. The Company, however, has not

estimated such savings in its revenue requirement.

Q. Can you specify any examples of projects that you would expect to yield savings?

A. Yes. Our first example is Project #3882 – NYS Pipeline Safety CMS Regulatory Compliance. The sanction paper for this project states that the current process for producing compliance reports is “manual and very time consuming.” Additionally, the paper states that deferring this project or doing nothing is “not sustainable given the level of manual effort required.” However, despite this elimination of, or substantial decrease in, manual work, the Company did not forecast any savings.

Q. Please explain your second example.

A. The sanction paper for Project #4170 – Time Transformation states that more than 50 percent of time entry is currently captured on paper and then entered manually into the computer system by time keepers. The purpose of the project is to reduce the administrative burden associated with manual time entry. However, the Company has not identified any savings or productivity

gains that would result even though the project would simplify a time-intensive manual process.

Q. Please explain your third example.

A. The sanction paper for Project #4398 - STORMS/ISched Upgrade states that this project will upgrade STORMS work management systems which have become unstable and have experienced multiple outages over the past several years. Reducing or eliminating such outages would reduce the amount of time that Company personnel must spend responding to these outages instead of focusing on their primary work. The Company did not estimate any productivity savings that would be gained by reducing or eliminating this distraction for normal work activities.

Q. Please explain your fourth example.

A. The sanction paper for Project #4188 – Aging System Stabilization states that the project will replace current network systems which are failing or no longer supported by the vendor. As with the prior project, replacement of a failing system should reduce the amount of time that Company employees spend trying to prop up an unreliable system rather than focusing on

their primary work activities.

Q. Please explain your fifth example.

A. The sanction paper for Project #4045 – Double Pole Management states that the project will provide automated interfaces between the National Grid “SmallWorld Geographic Information System (GIS)” STORMS (work management applications), and In-Quest Technologies SmartApp.com Double Pole tracking applications. This will enable electronic recording of new Double Pole tickets and accurate tracking of job status. By automating these interfaces and removing paper forms from the process, error rates will be greatly reduced and the data entry process will streamlined, which, in turn will reduce the number of trips electric engineers must make to the field to verify conditions at the double pole locations. This will improve the management and tracking of double poles in Niagara Mohawk’s service territory. However, despite these improvements in management and tracking of poles and error reductions, the Company did not forecast any savings associated with this project.

Q. Please explain your sixth example.
A. The sanction paper for Project #4464 – Data Visualization states that the project will provide capabilities to enhance data access to very large data sets, analytics, data visualization and export capabilities. This project will replace older reporting tools such as Microstrategy, which has experienced prolonged outages. Additionally, this project will automate standard reports that are currently performed manually. However, despite replacing a system which has had prolonged outages and the transition from manual to automated reports, the Company has not forecast any savings in the Rate Year associated with this project.
Q. Are you making an adjustment to any IS revenue requirement component to impute savings associated with these, and other, projects?
A. No. Despite many IRs asking the Company to quantify benefits associated with IS projects such as these, we have not received any information that would allow us to definitively impute such a savings adjustment. However,

there are numerous projects that reasonably should be anticipated to yield savings. The Company should not be allowed to avoid passing these savings to customers by refusing to acknowledge or quantify such reasonably anticipated savings, or reflect them in the revenue requirements.

Q. Does Staff have any recommendation for how to capture these unquantified but anticipated savings?

A. Yes. The Staff Policy Panel recommends an additional productivity adjustment based, in part, on these unquantified IS savings.

**Downward only reconciliation of IS Capital Investments**

Q. Is the Panel concerned that the Company will under-spend its Rate Year IS budget?

A. Yes. As previously discussed, the Company's historical data shows that there have been significant historical variances between the capital budget and actual expenditures. As discussed earlier in our testimony, the Company is planning a substantial increase in IS spending. However, the Company has not provided

enough support to show that it can ramp-up hiring and work to fully execute this ambitious spending plan. For these reasons, it is our opinion that there is a significant risk that the Company will again fail to execute its spending plan fully, thereby forcing customers to pay rates based on a level of new plant that is not actually deployed.

Q. Does your slippage adjustment address this concern?

A. Not entirely. Our slippage adjustment, as well as the adjustments to remove specific projects, reduces the allowed Service Company capital IS spending to $159 million in the Rate Year. However, despite this reduction from the Company's request of $286 million, it still exceeds the IS capital spend in prior years by a significant amount. FY 2015 and 2016 had total IS capital spend of $85 million and $93 million, respectively. And although FY 2017 reports IS capital spending of $153 million, Staff has concerns about the data for that fiscal year, as previously discussed.

Q. What do you recommend to address this concern?

A. We propose an IS Capital Investment Reconciliation Mechanism to protect ratepayers from paying delivery rates that are too high because the Company was not able to implement its entire IS investment plan.

Q. Please briefly describe the proposed IS Capital Investment Reconciliation Mechanism.

A. We recommend that the actual Service Company Rent expense associated with IS capital investments be compared with forecast Service Company Rent expense approved by the Commission. If actual investment falls short of the approved budget, the difference would be owed to customers and should be deferred for later disposition, with carrying charges calculated using the pre-tax rate of return approved by the Commission in this proceeding. However, the mechanism should be a one-way, downward only true-up. Therefore, if actual Service Company Rent expense exceeds the approved Rate Year allowance, a regulatory liability would not be established for the Company to recover from customers at a later date. The calculations needed for this mechanism should be made and

filed with the Secretary on or before July 31st of the subsequent Rate Year.

Q. Why does the Panel recommend that the mechanism be a one-way, downward-only true-up mechanism?

A. Budgeting and spending are activities wholly within the Company's control. Improving its performance in these areas also is within the Company's control. A two-way true-up will not provide an incentive for the Company to improve its budgeting and spending processes. Customers, on the other hand, have no control over the Company's level and pace of spending yet they bear the risk that the Company's historic challenges in spending to projected levels will continue, and will be reflected in rates. The true-up mechanism, therefore, should reconcile only on a downward to allocate these risks equitably between the Company and ratepayers.

**Future Process Improvements**

Q. Do you have any recommendations for future process improvements related to IS?

A. Yes. We have recommendations to improve the Company's IS variance reporting and investment

monitoring. We also have recommendations regarding the information provided in the IS sanction papers and IRS documents going forward.

Q. Please explain your first recommendation regarding IS reporting and monitoring.

A. Throughout our testimony, we have outlined our concerns with the Company's inability to spend up to its IS budget in the past. We have also discussed our concerns about the Company's prior implementation of its large-scale IS project, the USFP. Due to these concerns, we recommend that the Company provide reports to Staff and the Commission on a regular basis.

Q. What IS capital expenditure and variance reporting requirements do you recommend?

A. To enable Staff and the Commission to monitor the Company's IS investment plans, the Company should be required to make regular filings, as follows: (1) prior to the start of each Rate Year; (2) quarterly during the Rate Year; and (3) after the end of the Rate Year.

Q. What information should the Company be required to file shortly after the Commission sets rates in this case, and prior to the start of

subsequent Rate Years?

A. Prior to the beginning of the Rate Year, the Company should file with the Secretary its IS prioritization summary to identify the proposed IS projects and their estimated costs. It also should file the approved five-year capital plan for IS investments.

Q. What information should be filed on a quarterly basis?

A. The Company should file quarterly project variance reports to Staff with explanations for any variances between the approved budget and actual expenditures.

Q. When should the quarterly reports be filed?

A. We recommend that the Commission require quarterly reports to be filed within 45 days after the end of each of the first three calendar quarters of each Rate Year. The annual report may be filed in place of a report on fourth quarter performance.

Q. What information should be filed annually, after the end of a rate year?

A. We recommend that the Commission require that the annual reports include the following

information: (1) a final variance summary of IS capital expenditures for all capital projects and programs including all on-going and active projects and programs; (2) a narrative explaining any cost or timeline deltas exceeding 10 percent; (3) a narrative on project design, contract or software as a service status, and/or build status, including a detailed build schedule for each project, for any ongoing projects; (4) a description of any new projects or programs; and (5) IS capital project sanctioning documents for any projects exceeding $1 million that were authorized during the previous Rate Year.

Q. When should the annual reports be filed?

A. We recommend that the annual reports be filed not later than 60 days after the end of the last quarter in each Rate Year.

Q. Should these reporting requirements continue beyond the Rate Year?

A. Yes. It is important for the Commission to monitor the Company’s capital investment plans on an ongoing basis. Informational reports filed at regular intervals are critical to

maintain oversight of the IS investment plan. These recommendations are consistent with existing reporting requirements for the Company's electric and gas businesses. They also are critical to establishing the foundation for Staff to conduct a comprehensive, project-specific examination of IS projects in future rate proceedings that is comparable to its current examination of electric and gas capital plans.

Q. Please explain your second recommendation regarding information provided in the IS IRS and sanction papers.

A. Based on our review of IS IRS and sanction papers, we have concerns with the Company's cost estimates, as well as with the minimum cost solutions and benefit cost analysis for solutions that exceed the minimum cost solutions. The minimum cost solution is considered to be the least costly option to address the issue.

Q. What are your concerns with the Company's cost estimates?

A. In technical meetings, the Company explained

that it typically develops costs for projects using estimated labor hours and contract labor rates. However, Staff was unable determine if the estimated hours used to develop the cost estimates are reasonable.

Q. Can you give an example of this issue?

A. Yes. In the Company's response to IR DPS-559, for which it claimed confidentiality and requested an exception from disclosure, the Company provided information on project INVP #3932, the Customer Contact Center and Service Delivery Center. This response estimated the costs of this project using estimated hours and contract rates, as described above. However, Staff was unable to determine if these costs were reasonable because the estimated labor hours were developed based on judgment, rather than empirical data. Additionally, approximately 40 percent of the estimated cost of the project is "Other." We could not find a description of or support for this cost element, and therefore could not determine if it was reasonable.

Q. Can you provide another example of this issue?

A. Our second example is drawn from the Company's response to DPS-607, for which the Company also claimed an exception from disclosure because it purportedly includes confidential information. DPS-607 asked the Company to provide all workpapers and calculations supporting the operating expenses for each of the Grid Modernization IS projects. In response, the Company provided a detailed analysis of the estimated operating expenses for each project. However, many of these estimates were based on hard-coded variables, such as the number of labor hours and hourly rates. While the hourly rates may be tied to contracts, it was not possible for us to determine if rates for specific types of work and the number of hours needed were estimated appropriately.

Q. What are your concerns regarding the Company's minimum cost solutions?

A. In our review, we found instances where a project did not specifically identify whether the selected project was the minimum cost solution. For example, the sanction paper INVP #4289, "Network Improvement," was included on

pages 131 to 143 of the Company's response to DPS-275. The sanction paper describes the project as needed to "migrate 4 of the existing legacy network sites onto the new Verizon service." Pages 7 and 8 of the sanction paper list the three alternatives that were considered but ultimately rejected: (1) do nothing; (2) delay implementation; and (3) partial implementation. Although these are viable options, the sanction paper does not indicate whether the project selected was the minimum cost solution, or whether other full implementation services were considered.

Q. Why is this important?

A. The sanctioning process should provide complete transparency to Staff, and decision makers at the Company, to determine that all possible options and alternatives were considered. We need to verify that the utility is making the most cost-effective decision on whether to approve project spending. Although the sanction papers define alternatives, additional information is needed to improve Staff's review process.

Q. What improvements do you recommend to the Service Company's IRS, sanction documents, and other supporting documentation?

A. We recommend that that the Company more fully support its cost estimates and work collaboratively with Staff to show that such estimates are reasonable. Additionally, the sanction paper or IRS document should state if the solution chosen was the minimum-cost alternative. If the Company chose a higher-cost, or enhanced, program, the sanction paper should present an analysis that compares the benefits and costs associated with the project life cycle. It should further explain how the results of the analysis support the decision to pursue the selected alternative.

Q. Does this conclude your testimony at this time?

A. Yes.

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Cases 17-E-0238 & 17-G-0239

August 2017

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Prepared Testimony of:

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allocated share of capacity to each city gate during times when the system is constrained. The Staff Gas Programs and Supply Panel also supports the demand response program and proposes a collaborative to develop non-pipe alternatives an associated incentives that will help to avoid pipeline projects, reduce emissions and improve reliability in the future.

**PRODUCTIVITY**

Q. Did the Company include a productivity adjustment in its electric and gas rate filings?

A. Yes. The Company applied a standard productivity adjustment of a cumulative one percent of labor costs and payroll taxes. This one percent productivity adjustment was applied to existing employee labor costs, as well as to the costs of the incremental FTEs that the Company proposed in its Other Initiatives expense cost component.

Q. Does this Panel recommend an increase to the Company’s productivity adjustment?

A. Yes. We propose an overall one and a half percent productivity adjustment, applied to both existing employees and incremental FTEs, which

represents a half a percent increase to the standard one percent productivity adjustment.

Q. Please explain the basis for recommending an increase to the productivity adjustment.

A. We have identified areas where productivity savings were reasonably expected, but not specifically quantified, or totally captured, by the Company. The three primary areas that support the imputation of the additional productivity are: (1) the Company's plan to hire a large number of FTEs; (2) savings that can be expected to accrue as a result of the Company's large investments to IS; and, (3) the Company's implementation of new initiatives including distribution demonstration projects, enhanced pipeline compliance system, training labs and safety programs.

Q. Please describe the Company's hiring plans.

A. In its filing, the Company projected hiring 228.3 FTEs, with 147 in its electric business, 77.3 in its gas business and four shared between the two businesses. However, the Company has not recognized additional productivity gains beyond the one percent associated with these new

hires. While Staff has proposed adjustments to the new hires, Staff is recommending rate recovery of 183 new employees that will be hired throughout the Rate Year. These incremental employees, as they gain work experience and improve their work skills, will provide a corresponding increase in productivity, which should exceed the traditional one percent already applied. The SEIOP and the SGIOP anticipate that there will be additional benefits in the Rate Year based on the number and type of employees being hired.

Q. Are there additional new hires that the Company has not included in its FTE count or included in its one percent productivity adjustment?

A. Yes. The Service Company expects to hire 42 IS employees prior to the start of the Rate Year. However, the Company’s one percent productivity adjustment was not applied to any labor costs for these employees. Additionally, as with the other incremental employees, there should be an increase in productivity associated with these new hires.

Q. What types of new IS programs and projects are

being implemented in the Company's IS plan?
A. As explained earlier, the Service Company is planning a substantial investment in IS for its seven subsidiary operating companies. The new IS system budget categories are Cyber Security, Physical Security, FY18 Plan, Growth Playbook, PSC Mandate, Other Mandates, Tech Modernization, Grid Modernization, and Gas Business Enablement.
Q. Did Staff ask for the projected savings for each of the IS programs and projects?
A. Yes, the Staff IS Panel asked a number of IRs to try to determine the level of savings resulting from the significant IS investments.
Q. What was the Company's response?
A. As discussed in the Staff IS Panel, the Company stated that only five projects are expected to yield Rate Year savings, with total savings at the Service Company level of approximately $4.1 million. In subsequent IR responses, the Company repeatedly asserted that the only savings were those associated with these five projects.
Q. Do you believe that this estimate reasonably captures potential Rate Year savings for IS

projects?

A. No. Given that the Company projected Rate Year IS capital expenditures of $286 million, and has plans to put in service approximately $248 million of IS projects between the close of the historic test year and the start of the Rate Year, savings of $4.1 million does not seem reasonable.

Q. Please explain.

A. First, we acknowledge that some projects, such as those associated with security, are done to minimize risk and may not yield savings. But, many of the IS projects, even those not done for the sole purpose of achieving savings, should produce efficiencies. Additionally, we note that the Service Company plans to put in service approximately $248 million of IS projects between the close of the historic test year and the start of the Rate Year. Given that all these projects are projected to be in service for the full Rate Year, we would expect to see additional efficiencies associated with these projects included in the Rate Year revenue requirement.

Q. Did the Staff IS Panel provide any examples of IS projects that should produce Rate Year savings, but for which the Company did not quantify?

A. Yes. The Staff IS Panel reviewed a number of the projects and determined that there should be savings in the Rate Year that the Company did not quantify. Examples of these projects are included in the Staff IS Panel testimony.

Q. Please describe the Company's new initiatives proposed in the Rate Year.

A. The Company has proposed a number of new initiatives including distribution demonstration projects, enhanced pipeline compliance system, training labs and safety programs. As these initiatives will improve overall Company operations, we expect that these projects should result in additional savings and efficiencies.

Q. What does this Panel recommend regarding these unquantified savings?

A. We propose to impute an additional one-half percent productivity, thus bringing total productivity to one and one-half percent for the Rate Year. The additional productivity is

intended to capture the unquantified cost savings associated with the new FTEs, new IS systems and other new initiatives. Increasing the productivity to one and one-half percent results in a $3.124 million and $0.668 million reduction to electric and gas Rate Year O&M expense.

Q. Did you attempt to quantify the IS benefits?

A. Yes. We attempted to quantify the actual benefits, rather than imputing an additional productivity adjustment. However, we were unable to determine an exact amount of IS savings that should be imputed. Instead, we have done a high level analysis of potential IS savings to determine that our additional half percent productivity adjustment is reasonable.

Q. What did this analysis show?

A. Our analysis estimated additional IS savings that should accrue during the Rate Year as $3.225 million and $0.615 million for electric and gas, respectively. These amounts are comparable to the overall one-half percent productivity adjustment of $3.124 million and $0.668 million for electric and gas.

Considering the additional productivity gains that should be realized from the incremental employees and new initiatives, our one-half percent productivity adjustment is conservative.

Q. How did you calculate the estimated IS savings?

A. We started with Staff's adjusted Service Company Rate Year IS capital budget of $159.052 million, as discussed in the Staff IS Panel testimony. We then excluded security and mandated programs to arrive at a Service Company Rate Year IS budget that will produce savings of approximately $140.611 million.

Q. Why did you exclude security and mandated projects from this calculation?

A. We believe all of the IS budget categories have the potential to produce savings in the Rate Year. However, we recognize that security programs and mandated programs may produce less savings and, as such, we excluded them from our calculation to be conservative.

Q. Please continue with your calculation.

A. The Company has proposed to amortize the majority of these projects over seven years, while most Gas Business Enablement projects are

amortized over ten years. Given this information, we estimate an average amortization period of eight years. For most of these programs to be cost effective, we recognized that they should produce benefits that offset the costs over the duration of the amortization period. We, therefore, divided the Rate Year IS capital budget of $140.611 million by the eight year amortization period to arrive at overall expected annual Service Company savings of $17.576 million. We used the Company's allocation rates of 23.87 percent for electric and 4.58 percent for gas, as shown in the Company's Exhibit___(ISP-8) to arrive at expected Niagara Mohawk's Rate Year savings of $4.195 million for electric and $0.805 million for gas. As we previously stated, the Company has included $0.970 million and $0.190 million of savings in the Rate Year for electric and gas, therefore the net unquantified Rate Year savings is $3.225 million and $0.605 million for electric and gas, respectively. As previously noted, the Service Company plans to put in service approximately $248 million of IS

projects between the close of the historic test year and the start of the Rate Year. As we did not factor any of these projects into our analysis, we believe our estimated IS savings calculation is conservative.

Q. Has the Commission ever supported a productivity adjustment of greater than one percent?

A. Yes. The Commission has supported a productivity adjustment of greater than one percent in a number of rate orders, including those issued in the following cases: Case 93-E-1123, Long Island Lighting Company, issued July 3, 1995; Case 97-G-0409, St. Lawrence Gas Company, issued January 22, 1998; Case 08-E-0539, Con Edison, issued April 24, 2009; Cases 14-E-0318 and 14-G-0319, Central Hudson, issued April 22, 2015; Cases 15-E-0283 and 15-G-0284, RG&E, issued February 19, 2016; and Cases 15-E-0285 and 15-G-0286, NYSEG, issued February 19, 2016; Cases 16-G-0058 and 16-G-0059, KeySpan Gas East Corporation d/b/a National Grid and The Brooklyn Union Gas Company d/b/a National Grid NY, issued December 16, 2016.

Q. Did all of these rate orders result from

litigated cases?

A. No. Some, such as the rate order issued in Case 08-E-0539, resulted from a fully litigated case. However, other rate orders, such as the one issued in Cases 16-G-0058 and 16-G-0059, adopted the terms of a joint proposal submitted by the parties. Even though such joint proposals contain terms stating that the joint proposal should not be used in other proceedings, the rate orders issued by the Commission demonstrate its willingness to adopt productivity adjustments greater than one percent. Moreover, in Cases 16-G-0058 and 16-G-0059, for example, the two percent productivity adjustment adopted for the first rate year was consistent with the pre-filed testimonial position of Staff in that case.

Q. In Case 16-G-0257, the recent rate proceeding concerning NFG, did the Commission adopt a productivity adjustment greater than one percent?

A. No. Although Staff recommended in total a two percent productivity adjustment in that case, the Commission adopted a one percent

productivity adjustment.

Q. Why did Staff recommend a two percent productivity adjustment for NFG?

A. Staff recommended the additional productivity adjustment because of savings that should occur due to the implementation of a new computer information system.

Q. Why did the Commission reject Staff's recommended productivity adjustment?

A. The Commission explained that "Staff did not attempt to quantify or demonstrate the reasonableness of the adjustment by reference to other utility experiences with similar computer systems. Staff could potentially have explored the additional one percent as savings as a percentage of project value, full time employee savings or other means to support its proposed imputation."

Q. Are the circumstances of the instant case different from Case 16-G-0257?

A. Yes.

Q. Please explain.

A. First, the rate order in Case 16-G-0257 allowed ten new FTEs for NFG. In comparison, Staff's

revenue requirements in this case reflect an additional 182 FTEs for Niagara Mohawk, plus a substantial number of new IS employees. Second, NFG did not propose as many new initiatives as Niagara Mohawk. As noted earlier, NFG proposed one large project, a customer information system. In this case, Niagara Mohawk has proposed a myriad of IS enhancements, some large and some small, along with numerous traditional investments to modernize its aging system. Third, we have attempted to quantify reasonable IS savings, even in the face of an absence of information from Niagara Mohawk in response to discovery. This analysis shows that the additional one-half percent productivity adjustment is a conservative estimate of likely savings.

**AMR Meter Stranded Costs**

Q. When did Niagara Mohawk deploy the electric AMR meters currently in use?

A. In response to IR DPS-466, question 3, the Company indicates that “AMR deployment initiated in 2002 and was substantially completed by end

# Niagara Mohawk Power Corporation d/b/a National Grid

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

## Testimony and Exhibits of:

Kenneth D. Daly
Keri Sweet Zavaglia
Information Services Panel

## Book 1

April 28, 2017

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

Submitted by:
Niagara Mohawk Power Corporation

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Q. Please describe the Gas Business Enablement ("GBE") Program and the benefits for the Company's upstate gas business and customers.**

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

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

**D. Information Systems Investments**

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

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

Niagara Mohawk Power Corporation
d/b/a National Grid

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

Testimony and Exhibits of:

Revenue Requirements Panel
Exhibit __ (RRP-1) through
Exhibit __ (RRP-2)

Book 11

April 28, 2017

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

Submitted by:
Niagara Mohawk Power Corporation

nationalgrid

**Testimony of the Revenue Requirements Panel**

A. The expense specific schedules are as follows.

**Schedule 1 – Consultants**

Schedule 1 consists of five pages and shows the electric and gas costs associated with external consultants performing services for the Company. Page 5 details adjustments to normalize the Historic Test Year, including an adjustment to exclude non-recurring expenses associated with the Gas Business Enablement project. The Company also reclassified rate case expense costs and reflected them in individual schedules (discussed later in the Panel's testimony) to provide greater transparency of these costs. The Company also made an inflation adjustment to the remaining Historic Test Year costs.

**Schedule 2 – Contractors**

Schedule 2 consists of five pages and shows the electric and gas costs associated with external contractors performing services for the Company. Page 5 details adjustments to normalize the Historic Test Year, including an adjustment to remove expenses associated with major storm events that will be recovered through the existing major storm allowance. The Company made a further adjustment to increase the remaining Historic Test Year costs by inflation.

**Testimony of the Revenue Requirements Panel**

rentals, both directly and indirectly incurred. The forecast amounts are based on the Historic Test Year values inflated to the Rate Year and Data Years using the inflation rate in Exhibit ___ (RRP-8).

**Schedule 9 – Service Company Rent Expense**

The Service Company owns a number of shared assets that are used either by Service Company employees to provide services to affiliates or by the affiliates on a shared basis. These are primarily shared office facilities (*e.g.*, Reservoir Woods office building) and information software and systems. When the Service Company owns the shared asset, it charges the affiliates, including Niagara Mohawk, an asset recovery charge based on a pre-tax return on the asset (net of deferred taxes) and booked depreciation expense. The asset recovery charge is recovered through rent expense.

Schedule 9 consists of nine pages and shows the rent expense incurred by the Company from the Service Company. The first four pages are the same as the other schedules, with Page 5 detailing several adjustments to normalize the Historic Test Year and adjustments to reflect condition in the Rate Year and Data Years. Pages 6 through 9 provide greater detail on the elements of cost by sub-function. Workpapers 2 through 10 of Schedule 9 detail Service Company owned facilities and information systems. Information systems are

**Testimony of the Revenue Requirements Panel**

segregated by projects placed into service prior to or during the Historic Test Year, and projects to be placed in service in the Rate Year and Data Years.

**Q. What rate of return did the Company utilize for the Service Company asset recovery charge?**

A. The Company applied a weighted average pre-tax cost of capital ("pre-tax WACC") of 9.91 percent to calculate capital charges from the Service Company to Niagara Mohawk. However, in the event of a three-year settlement, the Company proposes to use an ROE of 10.29 to calculate Service Company capital charges to Niagara Mohawk, which would increase the pre-tax WACC to 10.32 percent. The calculation of the WACC for the Service Company asset recovery charge is described in the direct testimony of Company Witness Stephen H. Caldwell. The calculation of the corresponding pre-tax WACC is set forth in Exhibit __ (RRP-11), Workpapers to Exhibit ___ (RRP-3), Schedule 9, Workpaper 11.

**Information Services ("IS") Leases**

**Q. How did the Company develop the forecast for IS leases?**

A. The forecast is based on the amortization and return on existing and forecast IS projects. The return on IS capital projects is based on the pre-tax WACC of 9.91 percent, as noted above. The return is applied to the unamortized asset

**Testimony of the Revenue Requirements Panel**

balance less accumulated deferred income taxes, where appropriate, for IS projects. Exhibit __ (RRP-11), Workpapers to Exhibit RRP-3, Schedule 9, Workpapers 2,3,5,6,8 and 9 detail IS leases from the Service Company, segregated by projects placed into service prior to or during the Historic Test Year, and by projects to be placed into service in the Rate Year and Data Years. IS capital investments utilized or proposed for use as Service Company assets are discussed discussed in the testimony of the IS Panel and other Company witnesses. The IS Panel lists the investments and testimonies where various investments are discussed.

**Schedule 10 – Construction Reimbursement**

Schedule 10 consists of five pages and presents construction reimbursements received by the Company in the Historic Test Year. Page 5 reflects an adjustment to normalize the Historic Test Year and to increase the remaining Historic Test Year costs by inflation.

**Schedules 11 and 16 – Other Post Employment Benefits and Pension Expenses**

Schedules 11 and 16 each consist of seven pages that detail the estimated costs and assumptions associated with other post employment benefits ("OPEB") and pension expenses.

**Testimony of the Revenue Requirements Panel**

the treatment of this expense in the recent 2016 KEDLI and KEDNY Gas Rate Cases and the 2012 Electric and Gas Rate Cases.

**Schedule 27– Other Initiatives**

Schedule 27 consists of ten pages and shows the costs of other electric and gas initiatives to be implemented or adjusted by the Company. These costs represent the following:

- Electric and Gas O&M Expense Related to Increased Capital Expenditures;
- Transmission and Sub-Transmission Tower Painting;
- Transmission and Sub-Transmission Maintenance;
- Vegetation Management Program;
- Gas Inspections and Surveys;
- Gas Damage Prevention;
- Gas Mapping Service ("GIS");
- Gas Safety Programs;
- Workforce Adjustments (FTEs);
- Gas Business Enablement ("GBE");
- Energy Efficiency Labor;
- Reforming the Energy Vision ("REV") Projects (including AMI); and

**Testimony of the Revenue Requirements Panel**

- Non-pipes alternatives projects.

The direct testimony of the Company's Electric and Gas Infrastructure and Operations Panels ("EIOP" and "GIOP," respectively), Gas and Electric Customer Panels, AMI Panel, IS Panel, Outdoor Lighting Panel and Company Witness Elizabeth D. Arangio provide support for these costs.

**Schedule 28 – Productivity**

Schedule 28 consists of five pages and shows the credits relating to the estimated productivity adjustment of a cumulative annual one percent of labor costs and payroll taxes. The adjustment represents a credit (*i.e.*, reduction in the revenue requirement) of $6.336 million for the electric business and $1.355 million for the gas business in the Rate Year.

**Schedule 29 – Rate Case Expense**

Schedule 29 consists of five pages and shows the forecast costs of preparing this combined electric and gas rate filing. The Company requests authority to amortize these costs over three years.

aspirational, they often differ from the savings that are actually achievable. Initiatives that prove to be not viable are closed or placed on hold.

**Q. Please explain how PEX savings are reflected in the case.**

A. In the Historic Test Year and post-Historic Test Year period, there were 16 initiatives with achieved or forecast Type I O&M savings, totaling $4.622 million. The Company adjusted the revenue requirements to reflect its share of savings achieved in the Historic Test Year and its share of future estimated savings from the initiatives that impacted the Company. As shown in Exhibit __ (RRP-3), Schedule 34, pages 1 and 2, the adjustment reduced the Rate Year electric and gas revenue requirements by $0.241 million and $0.026 million, respectively (with inflation).

Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule 34, Workpapers 1 and 3 provides a description of the Type I O&M initiatives, the affected operating companies, and the allocation of savings to Niagara Mohawk's electric and gas businesses. The exhibit also contains the tracking documents for each initiative.

**B. <u>FY18 Efficiency Initiative</u>**

**Q. Please explain the FY18 Efficiency Initiative.**

**Testimony of the Revenue Requirements Panel**

A. In FY18, National Grid is undertaking an initiative to identify $30 million in savings across the US business. The FY18 Efficiency Initiative was initiated to partially fund the operating expense associated with critical investments in new technology and systems that will enhance operational performance and customer engagement such as the GBE project, which is described in the GIOP's testimony.

**Q. How is National Grid attempting to achieve the aspirational savings target associated with the FY18 Efficiency Initiative?**

A. National Grid endeavors to achieve the aspirational $30 million savings target through various companywide and departmental initiatives. Specifically, National Grid will leverage initiatives currently in progress and attempt to close any remaining gap by identifying new efficiency opportunities.

**Q. Has the Company made an adjustment to reflect the aspirational savings target of $30 million from the FY18 Efficiency Initiative?**

A. Yes. Although the actual level of savings that could be achieved through this effort is not known, the Company has nevertheless made an adjustment to the revenue requirement to reflect Niagara Mohawk's allocated share of the total aspirational savings target. Because the savings from the FY18 Efficiency Initiative were applied to the link period in FY18 and carried forward to the

**Testimony of the Revenue Requirements Panel**

Rate Year and Data Years, the Company made an adjustment to remove the one percent productivity adjustment (discussed next) from FY18 to avoid a double count. The adjustment is shown in Exhibit __ (RRP-11), Workpapers to Exhibit __ (RRP-3), Schedule 23, Workpaper 2. In total, the aspirational savings from the FY18 Efficiency Initiative reduced the Rate Year electric and gas revenue requirements by $4.092 million and $0.714 million, respectively, as shown in Exhibit ___ (RRP-3), Schedule 34, Pages 1 and 2.

**C. Productivity Adjustment**

**Q. Has the Company further reduced the revenue requirement by including a productivity adjustment?**

A. Yes. While the Company does not believe that a productivity adjustment is warranted, the Company recognizes that Staff has reflected a productivity adjustment in past Company rate filings. Accordingly, the Company is reducing the Rate Year electric and gas revenue requirements by $6.336 million and $1.355 million, respectively, which is equal to one percent of Niagara Mohawk's total electric and gas labor costs and payroll taxes. The adjustment is shown in Exhibit ___ (RRP-3), Schedule 28. The Company has not identified initiatives to achieve these savings and does not know if they can be achieved given the savings already reflected.

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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In the Matter of

Niagara Mohawk Power Corporation d/b/a National Grid

Cases 17-E-0238 & 17-G-0239

August 2017

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Prepared Testimony of Staff
Gas Safety Panel

William Wade
Utility Supervisor

Michael Pasinella
Utility Engineer 2 (Safety)

Jeremiah Belda
Assistant Engineer (Mechanical)

William Koch
Assistant Engineer (Mechanical)

Office of Electric, Gas, & Water

State of New York
Department of Public Service
Three Empire State Plaza
Albany, New York 12223-1350

Q. How will the leak prone pipe replacement costs and associated surcharges be handled?

A. The costs, unit cost cap, and associated surcharges related to the increase in leak prone pipe replacement will be addressed by the Staff Gas Infrastructure and Operations Panel.

Q. Will the increased mileage target affect the Company's risk assessment model?

A. No. We expect that NMPC will continue to use its risk assessment model to rank segments of pipe for replacement so that the pipe that presents the greatest risk to the public is retired before lower-risk pipe is retired. NMPC should be given the flexibility to complete opportunistic removals, such as neighborhood approaches, or in conjunction with other entities such as municipal repaving projects, but overall risk reduction should remain a driver of the removal program. In other words, and at a minimum, if using the neighborhood approach, areas removed should contain high-risk segments.

Q. Do you have any other recommendations regarding the removal of leak prone pipe?

A. Yes. NMPC inspects newly-installed pipelines to ensure that they are completed in accordance with applicable procedures and regulations. These pipelines contain materials that are superior to the pipe being replaced as long as it is constructed according to codes and standards, inspected for integrity and subject to a rigorous quality assurance program. We recommend that NMPC increase onsite inspections at least by an amount commensurate with the larger leak prone pipe removal targets to ensure that the quality of all pipe going into service meets workmanship and installation standards and inspection is compliant with 16 NYCRR 255.305, which requires each transmission line and main to be inspected. Staff has accounted for the appropriate amount of inspection in the recommended revenue requirement, and Staff believes that other efforts like the Gas Business Enablement program will improve quality assurance.

Q. Are there any other conditions that the Company should meet pertaining to these recommendations?

A. Yes. We recommend that NMPC submit a quarterly

# Niagara Mohawk Power Corporation d/b/a National Grid

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

## Rebuttal Testimony and Exhibits of:

## Revenue Requirements Panel

## Book 7

September 15, 2017

Submitted to:
New York State Public Service Commission
Case 17-E-0238
Case 17-G-0239

Submitted by:
Niagara Mohawk Power Corporation

nationalgrid

**Case 17-E-0238**
**Case 17-G-0239**

**Rebuttal Testimony of the Revenue Requirements Panel**

Telecoms Project. The project will be placed in service in the Rate Year. Staff reduced the investment amount, but did not calculate its return using the reduced Rate Year amount for the project. Applying the correct project adjustment to Service Company rent return creates an additional $0.015 million reduction in electric Service Company rent expense. Second, Staff's application of its proposed pre-tax WACC of 8.74 percent to the electric line of the new leases line item in Exhibit __ (SISP-3) was slightly overstated. If the 8.74 percent proposed by Staff is correctly applied, the pre-tax WACC would have reduced the Service Company Rent Expense for new leases to $14.911 million, not $14.891 million as set forth in Staff's Exhibit __ (SISP-3).

**Q. Please describe Staff's third adjustment.**

A. Staff imputes a slippage adjustment of 37 percent to the Company's Rate Year IS spending levels included in the revenue requirement, as well as Gas Business Enablement ("GBE"). The slippage adjustment results in a $5.175 million reduction to the electric revenue requirement and a $1.471 million reduction to the gas revenue requirement in the Rate Year.

**Q. Does the Company agree with Staff's adjustment?**

A. No. As discussed in the rebuttal testimonies of the IS Panel and

Company witness Johnny Johnston, the Company does not accept Staff's slippage adjustment.

**Q. Please describe Staff's fourth adjustment.**

A. Staff proposes removal of all AMI capital and expense costs from the Rate Year and postponing AMI implementation and deployment.

**Q. Does the Company agree with Staff's proposal?**

A. No. This adjustment is discussed in the rebuttal testimony of the Company's AMI Panel.

**Q. Please describe Staff's fifth proposal.**

A. Staff recommends downward adjustments of $1.346 million and $0.500 million to Rate Year electric and gas Service Company rent expense to reflect the removal of certain electric and gas distribution projects from the Rate Year.

**Q. Does the Company agree with Staff's proposal?**

A. No. As discussed in the rebuttal testimonies of the EIOP and GIOP, the Company does not agree with Staff's removal or reduction of certain projects, and does not accept Staff's adjustment.

**Case 17-E-0238**
**Case 17-G-0239**

**Rebuttal Testimony of the Revenue Requirements Panel**

**Q. Does the Company agree with Staff's adjustment?**

A. No. As discussed in the rebuttal testimony of the EIOP, the Company does not agree with Staff's adjustment.

**Q. Please describe Staff's IS, GBE and Grid Modernization other initiatives expense adjustments (Exhibit __ (SRRP-1), Adjustments 4(N)(15-17); Exhibit__ (SRRP-2), Adjustments 2(N)(7, 14-15)).**

A. Staff makes three adjustments in other initiatives expense related to IS, GBE, and Grid Modernization. First, Staff imputes a slippage adjustment to electric and gas IS run the business costs in the Rate Year. Staff also imputes a slippage adjustment on GBE and Grid Modernization project operating expenses in the Rate Year. Staff's third adjustment reduces IS operating expenses to reflect a historical average percent of IS operating expenses to capital expenditures, exclusive of GBE and Grid Modernization costs. The cumulative effects of all three adjustments are reductions to the electric and gas revenue requirements of $9.187 million and $4.836 million, respectively.

**Q. Does the Company agree with Staff's recommendation?**

A. No. As discussed in the rebuttal testimonies of the IS Panel and Company witness Johnny Johnston, the Company does not agree with the three

adjustments made by Staff.

**Q. Please describe Staff's twentieth adjustment (Exhibit __ (SRRP-1), Adjustment 4(N)(18); Exhibit__ (SRRP-2), Adjustment 2(N)(13)).**

A. While Staff agrees with the Company's projected cost of $0.400 million for a future management audit, Staff proposes that the projected management audit costs be recovered over a five-year period rather than entirely in the Rate Year. This adjustment results in reductions to the electric and gas Rate Year revenue requirements of $0.269 million and $0.51 million, respectively.

**Q. Does the Company agree with Staff's recommendation?**

A. The Company does not object to a five-year amortization of management audit costs as long as the Company has the opportunity to recover the entire amount projected.

**Q. Please describe Staff's adjustments to GIOP projects in the Rate Year (Exhibit__ (SRRP-2), Adjustment 2(N)(16-20)).**

A. Staff proposes five adjustments to projects discussed or included in the initial testimony and exhibits of the GIOP, all of which reduce the Rate Year revenue requirements for those projects. Specifically, Staff proposes

Niagara Mohawk Power Corporation d/b/a National Grid
PSC Case No. 17-E-0238
Company Rebuttal to PSC Staff Direct Case
Company Rebuttal to Staff Adjustments for the Rate Year Ending December 31, 2019
($000's)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (n) | **Other Initiatives** | | | | | | |
| (1) | To remove 6 FTE from EIOP Succession Planning | (67) | | 8 | | (58) | |
| (2) | To remove 1 FTE from SSP Energy Affordability Program | (85) | | 85 | | - | |
| (3) | To remove 2 FTEs from ECP DSP Functions | (226) | | 226 | | - | |
| (4) | To update opex rate and NMPC allocation per DPS-505 & DPS-664 | (364) | | 3 | | (362) | |
| (5) | To reduce salaries for entry-level positions | (103) | | 103 | | - | |
| (6) | To reflect slippage in hiring incremental FTEs | (721) | | 721 | | - | |
| (7) | To adjust productivity adjustment from 1.0% to 1.5% | (23) | | 23 | | - | |
| (8) | To reflect updated Capex forecast for Opex associated with Capex | (3,181) | | 3,176 | | (6) | |
| (9) | To reflect update of latest known data for Opex associated with Capex | (2,134) | | 2,134 | | - | |
| (10) | To disallow the incremental customer outreach and education budget | (664) | | 664 | | - | |
| (11) | To disallow enhanced bill design initiative | (398) | | 398 | | - | |
| (12) | To reduce OPEX and RTB related to enhanced bill design initiative | (52) | | 52 | | - | |
| (13) | To reduce OPEX and RTB related to AMI | (3,628) | | 3,628 | | - | |
| (14) | To reduce OPEX and RTB related to distribution projects | (3,605) | | 3,605 | | - | |
| (15) | To impute an IS slippage adjustment for RTB | (1,927) | | 1,927 | | - | |
| (16) | To impute slippage on GBE and Grid Mod. OPEX | (3,710) | | 3,710 | | - | |
| (17) | To impute a reduction to IS OPEX based on a % of allowed IS Capex | (3,550) | | 3,550 | | - | |
| (18) | To reduce future management audit costs due to amortization of costs instead | (269) | $ (24,707) | - | $ 24,012 | (269) | $ (694) |
| (o) | **Productivity** | | | | | | |
| (1) | Flow-through adjustments tracking labor and payroll tax adjustments | 38 | | (9) | | 28 | |
| (2) | To adjust productivity adjustment from 1.0% to 1.5% | (3,124) | $ (3,087) | 3,124 | $ 3,115 | - | $ 28 |
| (p) | **Uncollectibles** | | | | | | |
| | Flow-through adjustment tracking revenue adjustments | (595) | $ (595) | (220) | $ (220) | (815) | $ (815) |
| (q) | **Vegetation Management** | | | | | | |
| | To reduce transmission right-of-way vegetation management | (4,450) | $ (4,450) | 4,450 | $ 4,450 | - | $ - |
| (r) | **Major Non-Deferrable and Minor Storms** | | | | | | |
| | To normalize historic test year major non-deferrable and minor storm costs | (3,267) | $ (3,267) | 3,267 | $ 3,267 | - | $ - |
| (s) | **Savings** | | | | | | |
| | Flow-through adjustment from Productivity | - | $ - | (14) | $ (14) | (14) | $ (14) |
| | **Total Operating & Maintenance Expense Adjustments** | | $ (51,096) | | $ 39,664 | | $ (11,432) |
| **Adj. 5** | **Depreciation Expense** | | | | | | |
| (a) | To reflect changes in depreciation rate and capex flow through effect | (20,783) | | 20,650 | | (133) | |
| (b) | To reflect amortization of book reserve surplus | (5,412) | $ (26,195) | 5,412 | $ 26,062 | - | $ (133) |
| **Adj. 6** | **Taxes Other Than Revenue & Income Taxes** | | | | | | |
| (a) | **Real Estate Taxes** | | | | | | |
| | To reflect reduction to incremental additions to plant in service | (398) | $ (398) | 398 | $ 398 | - | $ - |
| (b) | **Special Franchise** | | | | | | |
| | To reflect reduction to incremental additions to plant in service | (346) | $ (346) | 346 | $ 346 | - | $ - |
| (c) | **Payroll Taxes** | | | | | | |
| | Flow-through adjustments tracking labor adjustments | (44) | $ (44) | 28 | $ 28 | (16) | $ (16) |
| | **Total Taxes Other Than Revenue & Income Taxes** | | $ (788) | | $ 772 | | $ (16) |
| **Adj. 7** | **Federal Income Taxes** | | | | | | |
| | Flow-through adjustment relating to state income tax adjustment | 1,227 | $ 1,227 | (945) | $ (945) | 282 | $ 282 |
| **Adj. 8** | **State Income Taxes** | | | | | | |
| | To remove tax only item - state year 2000 | 3,506 | $ 3,506 | (2,701) | $ (2,701) | 805 | $ 805 |
| | **Total Income Tax Adjustments** | | $ 4,733 | | $ (3,646) | | $ 1,087 |
| **Adj. 9** | **Rate Base** | | | | | | |
| (a) | **Net Utility Plant** | | | | | | |
| (1) | To adjust Company's plant additions forecast/includes Company's FY '18 adjustment | (4,852) | | (6,739) | | (11,591) | |
| (2) | To reflect changes in depreciation rate | 10,298 | | (10,298) | | - | |
| (3) | To write-off the stranded costs for the pre-AMR meters | (84,065) | | 84,065 | | - | |
| (4) | To reduce capitalized pension and OPEB costs | (5,247) | $ (83,866) | 5,247 | $ 72,275 | - | $ (11,591) |
| (b) | **Regulatory Assets / Liabilities** | | | | | | |
| | To reflect amortization of future management audit costs over 5 years | 302 | $ 302 | | $ - | 302 | $ 302 |

Niagara Mohawk Power Corporation d/b/a National Grid
PSC Case No. 17-G-0239
Company Rebuttal to PSC Staff Direct Case
Company Rebuttal to Staff Adjustments for the Rate Year Ending December 31, 2019
($000's)

| | | Staff Direct Amount | | Company Adjustments to Staff Amount | | Company Rebuttal Amount | |
|---|---|---|---|---|---|---|---|
| **Adj. 1** | **Operating Revenues** | (10,458) | $ (10,458) | - | $ - | (10,458) | $ (10,458) |
| (a) | To move energy efficiency costs into base rates | | | | | | |
| **Adj. 2** | **Operating and Maintenance Expenses** | | | | | | |
| (a) | Consultant Expense | | | | | | |
| | To normalize executive search firm costs | (11) | $ (11) | 11 | $ 11 | - | $ - |
| (b) | **Service Company Rates** | | | | | | |
| | (1) To impute NMPC rate of return | (238) | | 238 | | - | |
| | (2) To impute a slippage adjustment | (1,471) | | 1,471 | | - | |
| | (3) To disallow enhanced bill design initative | (6) | | 6 | | - | |
| | (4) To remove AMI from rate year | - | | - | | - | |
| | (5) To remove distribution projects from rate year | (500) | | 500 | | - | |
| | (6) To reflect the proper forecast amount of INVP 3882 | - | $ (2,226) | (39) | $ 2,187 | (39) | $ (39) |
| (c) | **FAS 106 - OPEB** | | | | | | |
| | (1) To delay implementation of FAS715 | - | | (385) | | | |
| | (2) To reflect the proper capitalization rate for fringe benefits | (13) | $ (13) | - | $ (385) | (13) | $ (398) |
| (d) | **FAS 112** | | | | | | |
| | To reflect the proper capitalization rate for fringe benefits | (97) | $ (97) | 97 | $ 97 | (0.07) | (0.07) |
| (e) | **Health Care** | | | | | | |
| | To reflect the proper capitalization rate for fringe benefits | (3) | $ (3) | (27) | $ (27) | (30) | $ (30) |
| (f) | **Group Life Insurance** | | | | | | |
| | To reflect the proper capitalization rate for fringe benefits | (10) | $ (10) | 9 | $ 9 | (1) | $ (1) |
| (g) | **FAS 87 - Pension** | | | | | | |
| | (1) To delay implementation of FAS715 | - | | (1,041) | | (1,041) | |
| | (2) To reflect the proper capitalization rate for fringe benefits | (14) | $ (14) | - | $ (1,041) | (14) | $ (1,055) |
| | | | | - | | | |
| (h) | **Thrift Plan** | | | | | | |
| | (1) To remove inflation from the Local 97 and 97C component of thrift plan | (24) | | 24 | | - | |
| | (2) To reflect the proper capitalization rate for fringe benefits | (7) | $ (31) | - | $ 24 | (7) | $ (7) |
| (i) | **Workers Comp** | | | | | | |
| | To reflect the proper capitalization rate for fringe benefits | (4) | $ (4) | - | $ - | (4) | $ (4) |
| (j) | **Materials- From Inventory** | | | | | | |
| | To adjust Materials from Inventory to normalize vendor charges | (84) | $ (84) | 84 | $ 84 | - | $ - |
| (k) | **Labor Expense** | | | | | | |
| | (1) To remove variable pay from miscellaneous pay | (349) | | - | | - | |
| | (2) To remove variable pay from sales commission employees | (35) | | - | | - | |
| | (3) To normalize miscellaneous pay | (18) | | - | | - | |
| | (4) To limit management wage increase to 3% per year | (174) | $ (576) | 174 | $ 174 | - | $ (402) |
| (l) | **Transportation** | | | | | | |
| | (1) To remove the backbilling pertaining to CY15, from the HTY | (48) | | 48 | | 0 | |
| | (2) To reflect Staff's auction proceeds | (65) | $ (113) | 65 | $ 114 | - | 0 |
| (m) | **Energy Efficiency** | | | | | | |
| | To update to Staff's forecast energy efficiency | 91 | $ 91 | - | $ - | 91 | $ 91 |
| (n) | **Other Initiatives** | | | | | | |
| | (1) To remove 4 FTE's from GIOP Increased OPEX Workload | (579) | | 579 | | - | |
| | (2) To remove 32 FTE's from GIOP Opex related to Capex | (813) | | 813 | | - | |
| | (3) To remove 1 FTE from SSP Energy Affordability program | (32) | | 32 | | - | |
| | (4) To reflect the decreased salary for entry-level positions | (48) | | 48 | | - | |
| | (5) To reflect slippage in hiring incremental FTE's | (785) | | 785 | | - | |
| | (6) To adjust productivity from 1% to 1.5% | (10) | | 10 | | - | |
| | (7) To impute an IS slippage adjustment for RTB | (620) | | 620 | | - | |
| | (8) To reduce OPEX and RTB related to AMI | - | | - | | - | |
| | (9) To reduce OPEX and RTB related to distribution projects | - | | - | | - | |
| | (10) To disallow enhanced bill initiative | (147) | | 147 | | - | |
| | (11) To reduce OPEX and RTB related to enhanced bill design initiative | (19) | | 19 | | - | |
| | (12) To disallow outreach and education budget | (136) | | 136 | | - | |
| | (13) To reduce future management audit costs due to amortization | (51) | | - | | (51) | |
| | (14) To impute slippage on GBE and Grid Mod OPEX | (3,535) | | 3,535 | | - | |
| | (15) To impute a reduction to IS OPEX based on a % of allowed IS Capex | (681) | | 681 | | - | |
| | (16) Staff adjusment to Gas Transmission Engineering-IMP/IVP Inspections (PHMSA) | (660) | | 660 | | - | |
| | (17) Staff adjustment to I & R- Increase Pipeline Survey | (1,000) | | 1,000 | | - | |
| | (18) Staff adjustment to CMS-Ipads | (775) | | 775 | | - | |
| | (19) Staff adjustment to Elevated Pressure Metering Program Maintenance | (47) | | 47 | | - | |