

Division 12-1

Request:

Referring to the response to Attachment DIV 3-53-1, page 8 of 22, please provide a detailed explanation of what each objective in the statement "Its objectives are to reduce risk, deliver a step change in business performance and deliver growth." Please also provide how the Company plans to measure achievement of each objective.

Response:

During the strategic assessment phase, National Grid set three objectives focused on creating long-term value for customers. These objectives were used to help define the program scope and assess the best option for program delivery. The strategic objectives were:

1. Reduce risk by improving application availability, supporting improved gas safety and compliance performance, and supporting the execution of new and ongoing capital programs.
2. Improve business performance through upgrades in operational effectiveness, customer experience, data management, data transparency and availability for regulatory processes, and support for a continuous improvement culture.
3. Create a platform for the future through the establishment of a standardized, unified system across jurisdictional operations with consistent processes, providing better flexibility to adapt to future business needs.

Based on analysis during the strategic assessment phase, the selected project approach identified by National Grid in this case was the option that best met these objectives.

National Grid is planning to measure the success of the Gas Business Enablement Program primarily through a set of baselined key performance indicators that will measure over 80 percent of the anticipated business case benefits. The Company's response to PUC 5-19 included six key performance indicators the New York Department of Public Service Staff has agreed to utilize in relation to the distribution business of the Company's affiliate, Niagara Mohawk Power Corporation, to measure the successful delivery of the Gas Business Enablement Program's enhanced capabilities beyond system replacement. A copy of the Company's response to PUC 5-19 is provided as Attachment DIV 12-1 for ease of reference.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Responses to Commission's Fifth Set of Data Requests
Issued January 5, 2018

PUC 5-19

Request:

Please explain what metrics have been recommended by the NYPSC staff and whether Niagara Mohawk has accepted any of them. Please provide details of any agreement on this issue.

Response:

On January 19, 2018, in the Niagara Mohawk Power Corporation (Niagara Mohawk) rate case (Cases 17-E-0238 and 17-G-0239), Niagara Mohawk, the New York Department of Public Service Staff (Staff), and the other parties entered into a Joint Proposal¹ in which Niagara Mohawk agreed to measure the following six key performance indicators that are intended to demonstrate successful delivery of the Gas Business Enablement Program's enhanced capabilities beyond system replacement:

1. The average number of completed Niagara Mohawk Customer Meter Services jobs per worker per day;
2. The average feet of main replaced per Niagara Mohawk Maintenance and Construction worker per day;
3. Niagara Mohawk work orders processed each year per each full-time equivalent engineering clerical employee;
4. Total call volume related to Niagara Mohawk customer moves and non-moves per year;
5. Total number of Niagara Mohawk gas safety non-compliance occurrences per year; and
6. Niagara Mohawk's customer experience (effort) rating based on customers surveys.

¹ The Joint Proposal memorializes the settlement agreement among Niagara Mohawk, Staff, and the other parties in the case and is subject to the New York Public Service Commission's review and approval.

Division 12-2

Request:

Referring to the response to Attachment DIV 3-53-1, page 9 of 22, "Within two years, 94% of the gas business front office systems will be at "end of life, up from 79% today." Please provide:

- a. the definition of "end of life";
- b. the total number and percent of systems used in RI gas business systems that are (1) at the "end of life" today, (2) will be at "end of life" within two years, and (3) will be replaced by the Gas Business Enablement program; and
- c. the total number and percent of systems used in RI electric business systems that are (1) at the "end of life" today, (2) will be at "end of life" within two years, and (3) will be replaced by the Gas Business Enablement program.

Response:

- a. When referring to a system that is at "end of life", the term "end of life" is defined as a system that is no longer receiving functional updates; no longer receiving security updates; and where commercial support arrangements from the system vendor are no longer available.
- b. The following responses relate to systems used only by Narragansett Gas:
 1. Of the systems referenced in Attachment DIV 3-53-1, there are 37 systems that are used by Narragansett Gas. Of these 37 systems, 17 systems (or 46 percent) are currently at end of life.
 2. In two years, without the Gas Business Enablement Program, the number and percent of end of life systems are forecast to be the same.
 3. The Gas Business Enablement Program will replace all 17 of the systems referenced in the response to part b.1., above.
- c. The following responses relate to systems used by Narragansett Electric.
 1. Of the systems referenced in Attachment DIV 3-53-1, there are eight systems that are used by Narragansett Electric. All eight of these systems are currently at end of life.

2. In two years, without the Gas Business Enablement Program, the number and percent of end of life systems are forecast to be the same.
3. The Gas Business Enablement Program will replace all eight of the systems referenced in the response to part c.1., above.

Division 12-3

Request:

Referring to the response to Attachment DIV 3-53-1, page 11 of 22, containing the statement “National Grid estimates that there will also be a total of approximately \$40 million in quantifiable annual benefits beginning after the enhanced capabilities are fully embedded in FY24. A portion of these benefits will result in cost savings for customers”; and page 20 of 22 of the same attachment that provides a detailed breakdown of annual benefits:

- a. For each benefit listed, please provide the amount of expected benefit and the portion of the benefit that will result in cost savings for customers by state jurisdiction.
- b. Please also provide all analysis and workpapers with formulas intact that show how each of the expected benefits were calculated for and/or allocated to each state jurisdiction.
- c. For each benefit that will result in cost savings for customer identified in (a) above, please provide a detailed explanation by state jurisdiction, how and when the customer will receive such benefit.
- d. For any estimated costs savings that will not result in a cost savings to customers, please explain why not.

Response:

- a. Please see the response to Division 9-18, Attachment DIV 9-18-1. Attachment DIV 9-18-1 provides a detailed breakdown of the amount of expected benefit and the portion that will result for customers by state jurisdiction. Attachment DIV 9-18-1 shows both Type I and Type II benefits.
- b. The tables provided below show the derivation of each Type I and Type II benefit expected to be produced in each jurisdiction, including for Rhode Island customers.
- c. The timeline for production of benefits is shown by year in Attachment DIV 9-18-1.
- d. Type II savings largely represent the *avoidance* of costs rather than reductions of current costs. Therefore, these types of savings are not deducted from the proposed revenue requirement. Except for the avoidance of potential penalties (which are not recovered through customer rates), these savings will inure to the benefit of customers in the form of a lower cost of service than otherwise would exist in the future, all else equal.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Responses to Division's Twelfth Set of Data Requests
Issued January 18, 2018

The Narragansett Electric Company d/b/a National Grid												
Gas Business Enablement (GBE)												
Total Benefits Forecasted as a Result of GBE Implementation												
For Fiscal Years Ending March 31, 2019 through 2027												
Initiative Description	Benefit Type	12-Months Ending March 31, 2019	12-Months Ending March 31, 2020	12-Months Ending March 31, 2021	12-Months Ending March 31, 2022	12-Months Ending March 31, 2023	12-Months Ending March 31, 2024	12-Months Ending March 31, 2025	12-Months Ending March 31, 2026	12-Months Ending March 31, 2027		
Asset - Advanced Analytics	Reduction / Reduction in Open via APM	-	-	13,750	1,223,730	1,980,000	1,980,000	1,980,000	1,980,000	1,980,000		
Engineering, Design, Estimating & Mobility	Reduction in Damages due to Data Quality Errors	-	573,259	573,259	573,259	573,259	573,259	573,259	573,259	573,259		
Work Management & Field Enablement	Critical / Back Office Productivity Improvement	143,315	-	1,835,367	2,131,393	2,131,393	2,131,393	2,131,393	2,131,393	2,131,393		
Work Management & Field Enablement	Damage Prevention - Reduced Travel/Mileage	-	37,275	49,700	49,700	49,700	49,700	49,700	49,700	49,700		
Work Management & Field Enablement	M&C Productivity Improvements - Base	-	1,024,995	7,274,626	7,377,085	7,377,085	7,377,085	7,377,085	7,377,085	7,377,085		
Customer Interaction	Reduce More Call Volume through Self-Service	-	-	-	-	642,130	906,536	906,536	906,536	906,536		
Customer Interaction	Reduction in Data Cleansing / Scrubbing Effort - Analytics	-	105,749	750,821	502,480	588,270	588,270	588,270	588,270	588,270		
Customer Interaction	Complex Jobs - Engineering Productivity Improvement	-	-	4,886	302,941	351,803	351,803	351,803	351,803	351,803		
Engineering, Design, Estimating & Mobility	Complex Jobs - Estimating Accuracy Free Avoidance	-	-	-	46,833	540,000	540,000	540,000	540,000	540,000		
Engineering, Design, Estimating & Mobility	Reduction in Maplogs via Field Data Entry	-	8,924	553,899	643,238	643,238	643,238	643,238	643,238	643,238		
Engineering, Design, Estimating & Mobility	Improved Project Delivery - Construction	-	35,278	2,187,272	2,540,000	2,540,000	2,540,000	2,540,000	2,540,000	2,540,000		
Engineering, Design, Estimating & Mobility	Reduction in Service Quality Penalties	-	-	-	-	629,809	889,142	889,142	889,142	889,142		
Customer Interaction	Reduced Compliance and Gas Safety Penalties	-	876,348	5,070,200	9,577,233	13,207,819	13,520,800	13,520,800	13,520,800	13,520,800		
Regulatory/ Compliance	CMS Collections Jobs - Reduction in Mileage	-	-	-	-	117,384	165,718	165,718	165,718	165,718		
Work Management & Field Enablement	CMS Planned Jobs - Reduction in Travel Time	-	-	-	-	561,142	792,200	792,200	792,200	792,200		
Work Management & Field Enablement	CMS Planned Jobs - Reduction in Available Time via Auto	-	202,249	269,798	269,798	269,798	269,798	269,798	269,798	269,798		
Work Management & Field Enablement	CMS Planned Jobs - Reduction in Mileage	-	-	-	-	111,240	111,240	111,240	111,240	111,240		
Work Management & Field Enablement	CMS Planned Jobs - Reduction in Travel Time	-	262,263	336,484	336,484	336,484	336,484	336,484	336,484	336,484		
Work Management & Field Enablement	Damage Prevention - Reduced Travel/Mileage	-	38,760	51,680	51,680	51,680	51,680	51,680	51,680	51,680		
Work Management & Field Enablement	Inspections - Reduced Travel/Mileage	-	90,007	120,009	120,009	120,009	120,009	120,009	120,009	120,009		
Work Management & Field Enablement	Inspections - Reduced Travel Time	-	-	-	-	3,718	5,249	5,249	5,249	5,249		
Work Management & Field Enablement	M&C and CMS Jobs - Reduced Turnaround	-	-	-	-	19,064	26,914	26,914	26,914	26,914		
Work Management & Field Enablement	Reduction in Field Test Communications	-	99,566	265,511	265,511	265,511	265,511	265,511	265,511	265,511		
Work Management & Field Enablement	Reduction in Meter Verification Jobs	-	121,024	161,365	161,365	161,365	161,365	161,365	161,365	161,365		
Total of Benefits Forecasted as a result of GBE Implementation		\$ 1,019,663	\$ 7,772,297	\$ 24,198,128	\$ 30,674,992	\$ 36,394,257	\$ 39,615,248	\$ 39,615,248	\$ 39,615,248	\$ 39,615,248		

The Narragansett Electric Company
d/b/a National Grid
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Responses to Division's Twelfth Set of Data Requests
Issued January 18, 2018

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

	Straight Hours ^{1,5}	OT Hours ⁵	Total Hours	% of OT	Improvement in Productivity		
					Improvement Rate ²	Hours of Improvement	Benefit
Boston Gas	1,116,603	401,446	1,518,048	26.44%	3.00%	33,498	\$ 1,755,132
Colonial Gas	177,186	53,456	230,641	23.18%	3.00%	5,316	\$ 278,509
KEDNY *	1,231,360	320,889	1,552,249	20.67%	3.00%	36,941	\$ 1,935,513
KEDLI *	765,440	180,086	945,526	19.05%	3.00%	22,963	\$ 1,203,157
Niagara Mohawk *	1,035,840	85,349	1,121,189	7.61%	3.00%	31,075	\$ 1,628,185
RI	366,822	133,904	500,726	26.74%	3.00%	11,005	\$ 576,589
Totals	4,693,250	1,175,129	5,868,379	20.02%	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)

Reduced Drive Time and Reduced Mileage - M&C Gate Box and Patch Inspection Jobs

		Travel Time								Mileage						
		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
Operating Company	Category															
Boston Gas	Gate Box Inspections	12,059	14	168,826	\$ 98,285	13.91%	23,484	\$ 34.93	\$ 13,671	2.30	27,782	\$ 19,170	13.91%	3,865	\$ 0.69	\$ 2,667
Colonial Gas	Gate Box Inspections	936	14	13,104	\$ 7,629	13.91%	1,823	\$ 34.93	\$ 1,061	2.30	2,156	\$ 1,488	13.91%	300	\$ 0.69	\$ 207
Boston Gas	Patch Inspection	9,607	14	134,498	\$ 78,300	13.91%	18,709	\$ 34.93	\$ 10,892	2.30	22,133	\$ 15,272	13.91%	3,079	\$ 0.69	\$ 2,124
Colonial Gas	Patch Inspection	1,138	14	15,932	\$ 9,275	13.91%	2,216	\$ 34.93	\$ 1,290	2.30	2,622	\$ 1,809	13.91%	365	\$ 0.69	\$ 252
Total		23,740		332,360	\$ 193,489	13.91%	46,231		\$ 26,914		54,694	\$ 37,739		7,608		\$ 5,249
Total Boston Gas	All								\$ 24,563							\$ 4,791
Total Colonial Gas	All								\$ 2,351							\$ 459

Assumptions / Sources / Notes

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

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

3 Gate box and patch inspection % reduction is assumed to be similar to the % reduction for CMS collections work which was calculated using OptimoRoute software; assumption based on resources dedicated to these inspection types

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

NOTE: Patch inspection reduction estimated to be as high as 50% as a result of analysis by Chris Gambale, Field Supervisor Malden

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

	Category	Units (Mains = Miles, Services = Units) ¹	Travel Mins Per Job ²	Total Travel Mins	Travel Time				Miles Per Job ²	Assumed Miles Driven	Cost Basis	Mileage Reduction ³	Miles Reduced	Cost Per Mile ⁵	Fleet Benefits	
					Cost Basis	Travel Time Reduction ³	Total Time Saved in Mins	Field Worker Hourly Rate ⁴								Travel Time Benefits
Opex																
Boston Gas	Damage Prevention	130,880	14	1,832,320	\$ 1,066,716	2.50%	45,808	\$ 34.93	\$ 26,668	4.17	546,410	\$ 377,023	2.50%	13,660	\$ 0.69	\$ 9,426
Colonial Gas	Damage Prevention	47,609	14	666,526	\$ 388,029	2.50%	16,663	\$ 34.93	\$ 9,701	4.17	198,763	\$ 137,146	2.50%	4,969	\$ 0.69	\$ 3,429
KEDNY	Damage Prevention	190,066	11	2,090,726	\$ 1,217,151	2.50%	52,268	\$ 34.93	\$ 30,429	4.17	793,505	\$ 547,519	2.50%	19,838	\$ 0.69	\$ 13,688
KEDLI	Damage Prevention	154,225	10	1,542,250	\$ 897,847	2.50%	38,556	\$ 34.93	\$ 22,446	4.17	643,873	\$ 444,272	2.50%	16,097	\$ 0.69	\$ 11,107
Niagara Mohawk	Damage Prevention	105,761	13	1,374,893	\$ 800,417	2.50%	34,372	\$ 34.93	\$ 20,010	4.17	441,541	\$ 304,663	2.50%	11,039	\$ 0.69	\$ 7,617
RI	Damage Prevention	61,581	12	738,972	\$ 430,205	2.50%	18,474	\$ 34.93	\$ 10,755	4.17	257,094	\$ 177,395	2.50%	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	\$ 0.69	\$ 49,700

Assumptions / Sources / Notes

- 1 Source: US Gas Opex Review 2016Q9 September (06-08) with Forecast
- 2 Travel time and miles per job for damage prevention is assumed to be similar to CMS planned work by OPCR; 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 OptimRoute 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 per mile provided by Joseph Nicoletti, Supply Chain / Fleet; cost includes fuel, parts, and external maintenance only

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Reduced Drive Time and Reduced Mileage - CMS Planned Jobs¹

State / Area	Operating Companies	Job Types	2 Year Job Count Average	2 Year UTC Job Count Average	UTC % FY16	Avg Productive Job Mins	Avg UTC Job Mins FY16	Avg Travel mins FY16	Total Productive Job Mins	Total UTC Job Mins	Total Productive Job Travel Mins	Tech Hourly Rate ²	Total Travel Mins	Total Travel Cost	Travel Time Reduction ³	Travel Time Reduction Benefits	# of Miles Traveled per Job ⁴	Miles Driven	Mileage				
																			Fleet Cost per Mile ⁵	Mileage Reduction Benefits			
LI	Keypas Gas East (KEDU)	Customer Driven Construction	9,187	633	6.45%	22	16	10	206,365.30	10,134.67	91,870	\$ 34.93	98,204	1,636.74	\$ 57,171	2.50%	1,429	4.17	38,355	\$ 26,465	2.50%	\$ 0.69	\$ 662
LI	Keypas Gas East (KEDU)	Field Collections Total																					
LI	Keypas Gas East (KEDU)	Gas Leak Investigation Total																					
LI	Keypas Gas East (KEDU)	Inner-Tie Total	498	153	23.50%	30	16	10	14,840	2,448	4,980	\$ 34.93	6,510	108	\$ 3,790	2.50%	95	4.17	2,079	\$ 1,435	2.50%	\$ 0.69	\$ 36
LI	Keypas Gas East (KEDU)	Investigations Total	3,498	2,673	43.32%	22	16	10	78,106	42,771	34,975	\$ 34.93	61,707	1,028	\$ 35,924	2.50%	898	4.17	14,602	\$ 10,075	2.50%	\$ 0.69	\$ 252
LI	Keypas Gas East (KEDU)	Meter Changes (Capital) Total	19,980	3,801	15.98%	43	16	10	866,570	60,818	199,795	\$ 34.93	237,806	3,963	\$ 138,443	2.50%	3,461	4.17	83,412	\$ 57,554	2.50%	\$ 0.69	\$ 1,439
LI	Keypas Gas East (KEDU)	Meter Oriented Services Total	74,040	9,487	11.36%	16	16	10	1,171,741	151,785	740,400	\$ 34.93	835,266	13,921	\$ 486,264	2.50%	12,157	4.17	309,109	\$ 213,285	2.50%	\$ 0.69	\$ 5,332
LI	Keypas Gas East (KEDU)	Meter/Regulator Work Total	4,760	1,757	26.96%	31	16	10	145,330	28,115	47,595	\$ 34.93	65,187	1,086	\$ 27,938	2.50%	948	4.17	19,870	\$ 13,711	2.50%	\$ 0.69	\$ 343
LI	Keypas Gas East (KEDU)	Misc. - Capital Total	15,326	2,527	14.16%	19	16	10	290,710	40,437	153,260	\$ 34.93	178,533	2,976	\$ 103,936	2.50%	2,598	4.17	63,984	\$ 44,149	2.50%	\$ 0.69	\$ 1,104
LI	Keypas Gas East (KEDU)	Other Emergency Total																					
LI	Keypas Gas East (KEDU)	Related to Meter Reading Total	31,613	6,104	16.18%	9	16	10	283,787	97,669	316,130	\$ 34.93	377,173	6,286	\$ 219,578	2.50%	5,489	4.17	131,981	\$ 91,067	2.50%	\$ 0.69	\$ 2,277
MA Electric	Keypas Gas / Colonial Gas	Customer Driven Construction	5,822	388	6.25%	7	6	14	38,663	2,329	81,512	\$ 34.93	86,946	1,449	\$ 50,617	2.50%	1,265	4.17	24,307	\$ 16,772	2.50%	\$ 0.69	\$ 419
MA Electric	Keypas Gas / Colonial Gas	Field Collections Total																					
MA Electric	Keypas Gas / Colonial Gas	Investigations Total	19,419	3,832	16.48%	11	6	14	205,811	22,992	271,869	\$ 34.93	325,517	5,425	\$ 189,505	2.50%	4,738	4.17	81,073	\$ 55,940	2.50%	\$ 0.69	\$ 1,399
MA Electric	Keypas Gas / Colonial Gas	Meter Change - Capital Total	31,076	2,240	6.72%	25	6	14	782,409	13,439	435,068	\$ 34.93	466,426	7,774	\$ 271,538	2.50%	6,788	4.17	129,740	\$ 89,521	2.50%	\$ 0.69	\$ 2,238
MA Electric	Keypas Gas / Colonial Gas	Meter Change - O&M Total	289	100	25.66%	16	6	14	4,745	598	4,043	\$ 34.93	5,438	91	\$ 3,166	2.50%	79	4.17	1,206	\$ 832	2.50%	\$ 0.69	\$ 21
MA Electric	Keypas Gas / Colonial Gas	Meter Oriented Services Total	82,648	3,105	3.62%	3	6	14	222,465	18,629	1,157,073	\$ 34.93	1,200,540	20,009	\$ 698,914	2.50%	17,473	4.17	345,047	\$ 238,082	2.50%	\$ 0.69	\$ 5,952
MA Electric	Keypas Gas / Colonial Gas	Misc. - Capital Total	4,042	373	8.45%	7	6	14	27,813	2,239	56,589	\$ 34.93	61,814	1,030	\$ 35,986	2.50%	900	4.17	16,875	\$ 11,644	2.50%	\$ 0.69	\$ 291
MA Electric	Keypas Gas / Colonial Gas	Other Emergency																					
MA Electric	Keypas Gas / Colonial Gas	Related to Meter Reading Total	11,671	1,119	8.75%	4	6	14	42,785	6,717	163,393	\$ 34.93	179,066	2,984	\$ 104,246	2.50%	2,606	4.17	48,725	\$ 33,620	2.50%	\$ 0.69	\$ 841
MA Gas	Keypas Gas / Colonial Gas	Capital Piping	32,685	6,551	20.70%	116	12	14	3,788,389	78,614	457,646	\$ 34.93	549,363	9,156	\$ 319,821	2.50%	7,996	4.17	136,473	\$ 94,166	2.50%	\$ 0.69	\$ 2,354
MA Gas	Keypas Gas / Colonial Gas	Customer Driven Construction	6,164	805	13.55%	53	12	14	329,272	9,660	86,289	\$ 34.93	97,559	1,626	\$ 56,765	2.50%	1,420	4.17	25,732	\$ 17,755	2.50%	\$ 0.69	\$ 444
MA Gas	Keypas Gas / Colonial Gas	Digsafe Total	668		0.00%	15	12	14	10,013		9,345	\$ 34.93	9,345	156	\$ 5,440	2.50%	136	4.17	2,787	\$ 1,923	2.50%	\$ 0.69	\$ 48
MA Gas	Keypas Gas / Colonial Gas	Field Collections Total																					
MA Gas	Keypas Gas / Colonial Gas	Gas Leak Investigation Total																					
MA Gas	Keypas Gas / Colonial Gas	Inner-Tie Total	1,024	910	47.06%	42	12	14	42,894	10,923	14,336	\$ 34.93	27,079	451	\$ 15,765	2.50%	394	4.17	4,275	\$ 2,950	2.50%	\$ 0.69	\$ 74
MA Gas	Keypas Gas / Colonial Gas	Investigations Total	4,476	2,096	31.90%	17	12	14	78,250	19,156	62,664	\$ 34.93	92,013	1,534	\$ 53,567	2.50%	1,339	4.17	18,687	\$ 12,894	2.50%	\$ 0.69	\$ 322
MA Gas	Keypas Gas / Colonial Gas	Meter Change - Capital Total	43,066		0.00%	13	12	14	555,964		602,917	\$ 34.93	602,917	10,049	\$ 350,998	2.50%	8,775	4.17	179,794	\$ 124,058	2.50%	\$ 0.69	\$ 3,101
MA Gas	Keypas Gas / Colonial Gas	Meter Change - O&M Total	99,716	26,917	21.26%	63	12	14	6,279,724	322,999	1,396,024	\$ 34.93	1,772,856	29,548	\$ 1,032,097	2.50%	25,802	4.17	416,304	\$ 287,250	2.50%	\$ 0.69	\$ 7,181
MA Gas	Keypas Gas / Colonial Gas	Meter Oriented Services Total	62,189	16,598	26.87%	33	12	14	2,075,688	196,780	2,075,688	\$ 34.93	2,075,688	33,317	\$ 640,513	2.50%	16,013	4.17	259,632	\$ 179,146	2.50%	\$ 0.69	\$ 4,879
MA Gas	Keypas Gas / Colonial Gas	Meter/Regulator Work Total	6,796	548	7.46%	44	12	14	296,241	6,578	95,137	\$ 34.93	102,811	1,714	\$ 59,853	2.50%	1,486	4.17	28,370	\$ 19,576	2.50%	\$ 0.69	\$ 489
MA Gas	Keypas Gas / Colonial Gas	Misc. Capital Total	13,969	4,320	23.62%	26	12	14	369,875	51,836	199,559	\$ 34.93	256,034	4,267	\$ 149,054	2.50%	3,726	4.17	58,317	\$ 40,239	2.50%	\$ 0.69	\$ 1,006
MA Gas	Keypas Gas / Colonial Gas	Other Emergency Total																					
MA Gas	Keypas Gas / Colonial Gas	Related to Meter Reading Total	2,618	1,318	33.49%	22	12	14	57,711	15,814	36,847	\$ 34.93	55,097	918	\$ 32,076	2.50%	802	4.17	10,528	\$ 7,541	2.50%	\$ 0.69	\$ 189
NYC	Brooklyn Union Gas (KEDNY)	Customer Driven Construction	10,308	1,317	11.33%	75	17	13	774,698	22,393	113,383	\$ 34.93	127,872	2,131	\$ 74,443	2.50%	1,861	4.17	43,033	\$ 29,693	2.50%	\$ 0.69	\$ 742
NYC	Brooklyn Union Gas (KEDNY)	Field Collections Total																					
NYC	Brooklyn Union Gas (KEDNY)	Gas Leak Investigation Total																					
NYC	Brooklyn Union Gas (KEDNY)	Inner-Tie Inspection Total	8,150	17,290	67.97%	38	17	11	312,481	293,930	89,645	\$ 34.93	279,834	4,664	\$ 162,910	2.50%	4,073	4.17	34,023	\$ 23,476	2.50%	\$ 0.69	\$ 587
NYC	Brooklyn Union Gas (KEDNY)	Investigations Total	55,174		0.00%	13	17	11	734,239		606,914	\$ 34.93	606,914	10,115	\$ 353,325	2.50%	8,833	4.17	230,346	\$ 154,918	2.50%	\$ 0.69	\$ 1,973
NYC	Brooklyn Union Gas (KEDNY)	Meter Change - Capital Total	12,233	870	6.64%	60	17	13	77,732	14,789	134,563	\$ 34.93	144,133	2,422	\$ 83,909	2.50%	2,098	4.17	51,071	\$ 35,239	2.50%	\$ 0.69	\$ 881
NYC	Brooklyn Union Gas (KEDNY)	Meter Oriented Services Total	185,551	64,290	25.73%	28	17	13	5,221,851	1,092,923	2,041,061	\$ 34.93	2,748,247	45,804	\$ 1,599,938	2.50%	39,998	4.17	774,656	\$ 534,512	2.50%	\$ 0.69	\$ 13,363
NYC	Brooklyn Union Gas (KEDNY)	Meter/Regulator Work Total	4,005	536	11.81%	34	17	13	137,632	9,112	44,050	\$ 34.93	49,946	832	\$ 29,077	2.50%	727	4.17	16,718	\$ 11,536	2.50%	\$ 0.69	\$ 288
NYC	Brooklyn Union Gas (KEDNY)	Misc. - Capital Total	46,066	11,975	20.63%	40	17	13	1,854,861	203,569	506,726	\$ 34.93	618,447	10,641	\$ 371,683	2.50%	9,292	4.17	192,321	\$ 132,701	2.50%	\$ 0.69	\$ 3,318
NYC	Brooklyn Union Gas (KEDNY)	Other Emergency Total																					
NYC	Brooklyn Union Gas (KEDNY)	Related to Meter Reading Total	6,304	2,454	28.02%	20	17	13	124,224	41,723	69,346	\$ 34.93	96,341	1,606	\$ 56,087	2.50%	1,402	4.17	26,319	\$ 18,160	2.50%	\$ 0.69	\$ 454
NYC	Brooklyn Union Gas (KEDNY)	Surveillance Total	113,630		0.00%	11	17	13	1,249,930		1,249,930	\$ 34.93	1,249,930	20,832	\$ 727,668	2.50%	18,192	4.17	474,393	\$ 327,331	2.50%	\$ 0.69	\$ 8,183
RI Electric	Narragansett Electric	Customer Driven Construction	2,239	129	5.45%	12	6	14	26,066	774	31,346	\$ 34.93	33,152	553	\$ 19,300	2.50%	482	4.17	9,348	\$ 6,450	2.50%	\$ 0.69	\$ 161
RI Electric	Narragansett Electric	Field Collections Total																					
RI Electric	Narragansett Electric	Investigations Total	7,476	1,090	12.72%	15	6	14	111,149	6,538	104,664	\$ 34.93	119,918	1,999	\$ 69,812	2.50%	1,745	4.17	31,212	\$ 21,536	2.50%	\$ 0.69	\$ 538
RI Electric	Narragansett Electric	Meter Change - Capital Total	10,760	1,194	9.99%	13	6	14	141,808	7,165	160,368	\$ 34.93	167,358	2,789	\$ 97,430	2.50%	2,436	4.17	44,922	\$ 30,996	2.50%	\$ 0.69	\$ 775
RI Electric	Narragansett Electric	Meter Change - O&M Total	418	131	23.91%	17	6	14	7,280	788	5,852	\$ 34.93	7,691	128	\$ 4,478	2.50%	112	4.17	1,7				

The Narragansett Electric Company
d/b/a National Grid
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Reduced Drive Time and Reduced Mileage - CMS Collections Jobs: ¹

State / Area	Type of Work	Job Count FY 2014	Job Count FY 2015	Job Count FY 2016	3 Year Average	Average Travel Time in Minutes	Total Annual Travel Time in Minutes	Field Tech. Hourly Rate: ²	Total Cost	Reduction in Travel Time (%) ³	Total Travel Time Benefits	# of Miles Traveled per Job ⁴	Miles Driven	Cost	Mileage Reduction ³	Fleet Cost per Mile ⁵	Mileage Reduction Benefits
MA Gas	Field Collections	120,172	119,171	79,522	106,288	14	1,488,037	\$ 34.93	\$ 866,185	13.91%	\$ 120,486	2.30	244,874	\$ 168,963	14.00%	\$ 0.69	\$ 23,655
MA Elec	Field Collections	119,296	116,083	121,152	118,844	14	1,669,811	\$ 34.93	\$ 968,504	13.91%	\$ 134,719	2.30	273,799	\$ 188,922	14.00%	\$ 0.69	\$ 26,449
RI Elec	Field Collections	28,972	37,643	53,328	39,981	14	559,734	\$ 34.93	\$ 325,821	13.91%	\$ 46,322	2.30	92,111	\$ 63,556	14.00%	\$ 0.69	\$ 8,898
RI Gas	Field Collections	36,891	57,367	49,312	47,857	12	574,280	\$ 34.93	\$ 334,288	13.91%	\$ 46,499	2.30	110,255	\$ 76,076	14.00%	\$ 0.69	\$ 10,651
NYC	Field Collections	270,248	194,075	127,117	197,307	11	2,170,373	\$ 34.93	\$ 1,263,373	13.91%	\$ 175,735	2.30	454,567	\$ 313,651	14.00%	\$ 0.69	\$ 43,911
LI	Field Collections	41,346	49,500	58,028	49,625	13	645,121	\$ 34.93	\$ 375,524	13.91%	\$ 52,235	2.30	114,328	\$ 78,887	14.00%	\$ 0.69	\$ 11,044
UNY Gas	Field Collections	43,279	46,918	42,276	44,158	13	574,050	\$ 34.93	\$ 334,154	13.91%	\$ 46,481	2.30	101,733	\$ 70,196	14.00%	\$ 0.69	\$ 9,827
UNY Elec	Field Collections	64,919	187,672	169,102	140,564	15	2,108,465	\$ 34.93	\$ 1,227,336	13.91%	\$ 170,722	2.30	323,641	\$ 223,450	14.00%	\$ 0.69	\$ 31,283
Total					744,823	15	9,785,971		\$ 5,695,185		\$ 792,200		1,175,508	\$ 1,183,700			\$ 165,718

Travel Time Benefits

Allocator

82.00%

18.00%

Boston Gas	209,268
Colonial Gas	45,937
Brooklyn Union Gas (BEDNY)	175,735
KeySpan Gas East (KEDU)	52,235
NiagaraMohawk Gas	217,203
Narragansett Gas	91,821
Total	\$ 792,200

Mileage Benefits

82.00%

18.00%

Boston Gas	41,085
Colonial Gas	9,019
Brooklyn Union Gas (BEDNY)	43,921
KeySpan Gas East (KEDU)	11,044
NiagaraMohawk Gas	41,110
Narragansett Gas	19,549
Total	\$ 165,718

Assumptions, Sources, & Notes

1 Source: CMS US P138 Workplan; Animateur, Westfield, CNE Resource Planning; jobs included collection jobs only

2 CMS Tech rate provided by NG Finance; hourly rate assumes an average for that category of employment titles / levels (e.g., Technician A, Technician B, etc.)

3 Travel time and mileage reduction of approximately 28% determined through analysis using OptimRoute software and Google Maps; 14% was agreed / confirmed for both travel time and mileage with Megan Piarretto and Danielle Morrissey as collections work is not interrupted by emergent work

4 # of miles traveled per job determined through analysis using OptimRoute software and then putting the updated routes through Google Maps to get the mileage

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

6 Boston Gas and Colonial Gas benefit split based on general allocator % (Boston Gas - 82%, Colonial Gas - 18%)

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Reduced Available Time / Auto Dispatch - CMS Non-Emergency and Non-Collections ¹

Annual Benefit	Using May As Representative Sample	Using June As Representative Sample
% Days w/ 43+ minutes available ²	3.17%	2.93%
Average # of jobs that could be autoscheduled per day with 43+ minutes of available time	1.3	1.3
Total CMS Techs ³	2,042	2,042
Working Days per Year	240	240
Total CMS Working Days	490,080	490,080
Days w / 43+ minutes available	15,554	14,345
Total # of Jobs to be autoscheduled	19,765	18,056
CMS Tech HourlyRate ⁴	\$ 34.93	\$ 34.93
Average job time (minutes on the job) in hours ⁵	0.52	0.52
Cost per job	\$ 18.05	\$ 18.05
Total annual representative benefit	\$ 356,699	\$ 325,858

Benefit Calculation ⁶

Total CMS Working Days	490,080
Average % of Available Time	3.05%
Days w / 43+ minutes available (ability to do 1 additional job)	14,950
Total Benefit	\$ 269,798

Operating Company ⁷

	General Allocators (%)	Benefits
Boston Gas	23.29%	\$ 62,836
Colonial Gas	5.21%	\$ 14,056
Brooklyn Union Gas (KEDNY)	30.10%	\$ 81,209
Keyspan Gas East (KEDLI)	21.55%	\$ 58,141
Niagara Mohawk Gas	12.44%	\$ 33,563
Narragansett Gas	7.41%	\$ 19,992
Total	100%	\$ 269,798

Assumptions / Sources / Notes

1 Source: CMS Job Extract; April - June 2016; Richard Wester

2 Average minutes on the job and travel time for CMS planned jobs equals 43 minutes; minutes on the job excluding travel time equals 31 minutes

3 # of CMS Techs derived from HRIS extract provided by J'Wynn DeRamos; includes both Gas and Electric Techs

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

5 Minutes on the job used to determine the cost of a job; travel time excluded

6 Benefit calculation completed on the average of the 2 months data

7 Benefits split by operating company using general allocator; not enough detail in sample set to conclude benefits by operating company using data

The Narragansett Electric Company
d/b/a National Grid
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Reduce UTCs / Improved Information - CMS Non-Emergency and Non-Collections

State / Area	Operating Companies	Job Types	2 Year Job Count Average *	2 Year UTC Job Count Average	UTC % FY15 & FY16	Avg Productive Job Mins FY15	Avg UTC Job Mins FY16	Avg Travel mins FY16	Total Productive Job Mins	Total UTC Job Mins	Total Productive Job Travel Mins	Tech Hourly Rate ²	% Reduction in UTCs ³	Total UTC Mins Saved ⁴	Total UTC Benefits
LI	Keyspan Gas East (KEDU)	Customer Driven Construction Total	9,187	586	6.00%	22	16	10	206,365	9,382	91,870	\$ 34.93	2.50%	235	\$ 137
LI	Keyspan Gas East (KEDU)	Field Collections Total													
LI	Keyspan Gas East (KEDU)	Gas Leak Investigation Total													
LI	Keyspan Gas East (KEDU)	Inner-Tite Total	498	153	23.50%	30	16	10	14,940	2,448	4,980	\$ 34.93	2.50%	61	\$ 36
LI	Keyspan Gas East (KEDU)	Investigations Total	3,498	2,673	43.32%	22	16	10	78,106	42,771	34,975	\$ 34.93	2.50%	1,069	\$ 622
LI	Keyspan Gas East (KEDU)	Meter Changes (Capital) Total	19,980	3,801	15.98%	43	16	10	866,570	60,818	199,795	\$ 34.93	2.50%	1,520	\$ 885
LI	Keyspan Gas East (KEDU)	Meter Oriented Services Total	74,400	9,487	11.36%	16	16	10	1,171,741	151,785	740,400	\$ 34.93	2.50%	3,795	\$ 2,209
LI	Keyspan Gas East (KEDU)	Meter/Regulator Work total	4,760	1,757	26.96%	31	16	10	145,330	28,115	47,595	\$ 34.93	2.50%	703	\$ 409
LI	Keyspan Gas East (KEDU)	Misc. - Capital Total	15,326	2,527	14.16%	19	16	10	290,710	40,437	153,260	\$ 34.93	2.50%	1,011	\$ 589
LI	Keyspan Gas East (KEDU)	Other Emergency Total													
LI	Keyspan Gas East (KEDU)	Related to Meter Reading Total	31,613	6,104	16.18%	9	16	10	283,787	97,669	316,130	\$ 34.93	2.50%	2,442	\$ 1,421
MA Electric and Gas	Boston Gas / Colonial Gas	Customer Driven Construction	5,822	388	6.25%	7	6	14	38,663	2,329	81,512	\$ 34.93	2.50%	58	\$ 34
MA Electric and Gas	Boston Gas / Colonial Gas	Field Collections													
MA Electric and Gas	Boston Gas / Colonial Gas	Investigations Total	19,419	3,832	16.48%	11	6	14	205,811	22,992	271,869	\$ 34.93	2.50%	575	\$ 335
MA Electric and Gas	Boston Gas / Colonial Gas	Meter Change - Capital Total	31,076	2,240	6.72%	25	6	14	782,409	13,439	435,068	\$ 34.93	2.50%	336	\$ 196
MA Electric and Gas	Boston Gas / Colonial Gas	Meter Change - O&M Total	289	100	25.66%	16	6	14	4,745	598	4,043	\$ 34.93	2.50%	15	\$ 9
MA Electric and Gas	Boston Gas / Colonial Gas	Meter Oriented Services Total	82,648	3,105	3.62%	3	6	14	222,465	18,629	1,157,073	\$ 34.93	2.50%	466	\$ 271
MA Electric and Gas	Boston Gas / Colonial Gas	Misc. - Capital Total	4,042	373	8.45%	7	6	14	27,813	2,239	56,589	\$ 34.93	2.50%	56	\$ 33
MA Electric and Gas	Boston Gas / Colonial Gas	Other Emergency													
MA Electric and Gas	Boston Gas / Colonial Gas	Related to Meter Reading Total	11,671	1,119	8.75%	4	6	14	42,785	6,717	163,393	\$ 34.93	2.50%	168	\$ 98
MA Electric and Gas	Boston Gas / Colonial Gas	Capital Fitting	32,689	6,551	16.70%	116	12	14	3,788,389	78,614	457,646	\$ 34.93	2.50%	1,965	\$ 1,144
MA Electric and Gas	Boston Gas / Colonial Gas	Customer Driven Construction Total	6,164	805	11.55%	53	12	14	329,272	9,660	86,289	\$ 34.93	2.50%	241	\$ 141
MA Electric and Gas	Boston Gas / Colonial Gas	Digsafe Total	668	-	0.00%	15	12	14	10,013	-	9,345	\$ 34.93	2.50%	-	\$ -
MA Electric and Gas	Boston Gas / Colonial Gas	Field Collections Total													
MA Electric and Gas	Boston Gas / Colonial Gas	Gas Leak Investigation Total													
MA Electric and Gas	Boston Gas / Colonial Gas	Inner-Tite Inspection	1,024	910	47.06%	42	12	14	42,894	10,923	14,336	\$ 34.93	2.50%	273	\$ 159
MA Electric and Gas	Boston Gas / Colonial Gas	Inside Inspections Total	4,476	2,096	31.90%	17	12	14	78,250	25,156	62,664	\$ 34.93	2.50%	629	\$ 366
MA Electric and Gas	Boston Gas / Colonial Gas	Investigations Total	43,066	-	0.00%	13	12	14	555,964	-	602,917	\$ 34.93	2.50%	-	\$ -
MA Electric and Gas	Boston Gas / Colonial Gas	Meter Change - O&M Total	99,716	26,917	21.26%	63	12	14	6,279,724	322,999	1,396,024	\$ 34.93	2.50%	8,075	\$ 4,701
MA Electric and Gas	Boston Gas / Colonial Gas	Meter Oriented Services Total	62,189	16,398	20.87%	33	12	14	2,075,688	196,780	870,646	\$ 34.93	2.50%	4,919	\$ 2,864
MA Electric and Gas	Boston Gas / Colonial Gas	Meter/Regulator Work total	6,796	548	7.46%	44	12	14	296,941	6,578	95,137	\$ 34.93	2.50%	164	\$ 96
MA Electric and Gas	Boston Gas / Colonial Gas	Misc. Capital Total	13,969	4,320	23.62%	26	12	14	369,875	51,836	195,559	\$ 34.93	2.50%	1,296	\$ 754
MA Electric and Gas	Boston Gas / Colonial Gas	Other Emergency Total													
MA Electric and Gas	Boston Gas / Colonial Gas	Related to Meter Reading Total	2,618	1,318	33.49%	22	12	14	57,711	15,814	36,647	\$ 34.93	2.50%	395	\$ 230
NYC	Brooklyn Union Gas (KEDNY)	Customer Driven Construction Total	10,308	1,317	11.33%	75	17	11	774,698	22,393	113,383	\$ 34.93	2.50%	560	\$ 326
NYC	Brooklyn Union Gas (KEDNY)	Field Collections Total													
NYC	Brooklyn Union Gas (KEDNY)	Gas Leak Investigation Total													
NYC	Brooklyn Union Gas (KEDNY)	Inner Tite Inspection Total	8,150	17,290	67.97%	38	17	11	312,481	293,930	89,645	\$ 34.93	2.50%	7,348	\$ 4,278
NYC	Brooklyn Union Gas (KEDNY)	Investigations Total	55,174	-	0.00%	13	17	11	734,239	-	606,914	\$ 34.93	2.50%	-	\$ -
NYC	Brooklyn Union Gas (KEDNY)	Meter Change - Capital Total	12,233	870	6.64%	60	17	11	737,732	14,789	134,563	\$ 34.93	2.50%	370	\$ 215
NYC	Brooklyn Union Gas (KEDNY)	Meter Oriented Services Total	185,551	64,290	25.73%	28	17	11	5,221,851	1,092,923	2,041,061	\$ 34.93	2.50%	27,323	\$ 15,907
NYC	Brooklyn Union Gas (KEDNY)	Meter/Regulator Work total	4,005	536	11.81%	34	17	11	137,612	9,112	44,050	\$ 34.93	2.50%	228	\$ 133
NYC	Brooklyn Union Gas (KEDNY)	Misc. - Capital Total	46,066	11,975	20.63%	40	17	11	1,854,861	203,569	506,726	\$ 34.93	2.50%	5,089	\$ 2,963
NYC	Brooklyn Union Gas (KEDNY)	Other Emergency Total													
NYC	Brooklyn Union Gas (KEDNY)	Related to Meter Reading Total	6,304	2,454	28.02%	20	17	11	124,224	41,723	69,344	\$ 34.93	2.50%	1,043	\$ 607
NYC	Brooklyn Union Gas (KEDNY)	Surveillance Total	113,630	-	0.00%	11	17	11	1,249,930	-	1,249,930	\$ 34.93	2.50%	-	\$ -
RI Electric	Narragansett Electric	Customer Driven Construction	2,239	129	5.45%	12	6	14	26,066	774	31,346	\$ 34.93	2.50%	19	\$ 11
RI Electric	Narragansett Electric	Field Collections													
RI Electric	Narragansett Electric	Investigations Total	7,476	1,090	12.72%	15	6	14	111,149	6,538	104,664	\$ 34.93	2.50%	163	\$ 95
RI Electric	Narragansett Electric	Meter Change - Capital Total	10,760	1,194	9.99%	13	6	14	141,808	7,165	150,640	\$ 34.93	2.50%	179	\$ 104
RI Electric	Narragansett Electric	Meter Change - O&M Total	418	131	23.91%	17	6	14	7,280	788	5,852	\$ 34.93	2.50%	20	\$ 11
RI Electric	Narragansett Electric	Meter Oriented Services Total	42,077	931	2.17%	3	6	14	117,305	5,587	589,078	\$ 34.93	2.50%	140	\$ 81
RI Electric	Narragansett Electric	Misc. - Capital Total	1,794	54	2.95%	5	6	14	9,756	327	25,116	\$ 34.93	2.50%	8	\$ 5
RI Electric	Narragansett Electric	Other Emergency Total													
RI Electric	Narragansett Electric	Related to Meter Reading Total	4,600	904	16.42%	4	6	14	16,751	5,423	64,393	\$ 34.93	2.50%	136	\$ 79
RI Gas	Narragansett Gas	Capital Piping	10,473	45	0.43%	231	8	12	2,419,148	359	125,670	\$ 34.93	2.50%	9	\$ 5
RI Gas	Narragansett Gas	Customer Driven Construction	3,416	1,687	33.06%	42	8	12	143,014	13,499	40,992	\$ 34.93	2.50%	337	\$ 196
RI Gas	Narragansett Gas	Field Collections Total													
RI Gas	Narragansett Gas	Gas Leak Investigation Total													
RI Gas	Narragansett Gas	Investigations Total	5,530	1,356	19.70%	36	8	12	200,830	10,852	66,354	\$ 34.93	2.50%	271	\$ 158
RI Gas	Narragansett Gas	Meter Change - O&M Total	10,534	5,259	33.30%	50	8	12	531,930	42,070	126,408	\$ 34.93	2.50%	1,052	\$ 612
RI Gas	Narragansett Gas	Meter Oriented Service	34,738	3,696	9.62%	46	8	12	1,600,366	29,570	416,850	\$ 34.93	2.50%	739	\$ 430
RI Gas	Narragansett Gas	Misc Capital Total	92	6	6.63%	30	8	12	2,710	52	1,098	\$ 34.93	2.50%	1	\$ 1
RI Gas	Narragansett Gas	Other Emergency Total													
RI Gas	Narragansett Gas	Related to Meter Reading	2,573	531	17.10%	21	8	12	54,208	4,245	30,870	\$ 34.93	2.50%	106	\$ 62
UNY Electric	NiagaraMohawk Electric	Customer Driven Construction	7,972	2,248	22.00%	20	8	15	160,316	17,987	119,573	\$ 34.93	2.50%	450	\$ 262
UNY Electric	NiagaraMohawk Electric	Field Collections Total													
UNY Electric	NiagaraMohawk Electric	Investigations Total	35,532	4,805	11.91%	23	8	15	815,272	38,443	532,973	\$ 34.93	2.50%	961	\$ 560
UNY Electric	NiagaraMohawk Electric	Meter Change - Capital Total	23,099	4,261	15.57%	16	8	15	380,967	34,088	346,478	\$ 34.93	2.50%	852	\$ 496
UNY Electric	NiagaraMohawk Electric	Meter Change - O&M Total	374	79	17.45%	17	8	15	6,358	633	5,610	\$ 34.93	2.50%	16	\$ 9
UNY Electric	NiagaraMohawk Electric	Meter Oriented Services Total	154,413	25,932	14.38%	15	8	15	2,334,870	207,454	2,316,188	\$ 34.93	2.50%	5,186	\$ 3,019
UNY Electric	NiagaraMohawk Electric	Misc. - Capital Total	5,428	603	10.00%	19	8	15	103,620	4,825	81,420	\$ 34.93	2.50%	121	\$ 70
UNY Electric	NiagaraMohawk Electric	Other Emergencies Total													
UNY Electric	NiagaraMohawk Electric	Related to Meter Reading Total	8,394	1,254	13.00%	15	8	15	124,424	10,034	125,903	\$ 34.93	2.50%	251	\$ 146
UNY Gas	NiagaraMohawk Gas	Customer Driven Construction	6,469	2,975	31.50%	44	8	13	287,275	23,798	84,097	\$ 34.93	2.50%	595	\$ 346
UNY Gas	NiagaraMohawk Gas	Field Collections Total													
UNY Gas	NiagaraMohawk Gas	Gas Leak Investigation Total													
UNY Gas	NiagaraMohawk Gas	Investigations Total	17,384	3,291	15.92%	26	8	13	451,724	26,324	225,986	\$ 34.93	2.50%	658	\$ 383
UNY Gas	NiagaraMohawk Gas	Meter Change - Capital Total	20,365	5,810	22.20%	48	8	13	972,054	46,477	264,745	\$ 34.93	2.50%	1,162	\$ 676
UNY Gas	NiagaraMohawk Gas	Meter Change - O&M Total	3,036	426	12.29%	19	8	13	59,196	3,405	39,468	\$ 34.93	2.50%	85	\$ 50
UNY Gas	NiagaraMohawk Gas	Meter Oriented Services Total	78,652	11,753	13.00%	22	8	13	1,733,338	94,021	1,022,476	\$ 34.93	2.50%	2,351	\$ 1,368
UNY Gas	NiagaraMohawk Gas	Meter/Regulator Work	-	-	39.00%	20	8	13	-	-	-	\$ 34.93	2.50%	-	\$ -
UNY Gas	NiagaraMohawk Gas	Misc. - Capital Total	13,809	1,663	10.75%	36	8	13	495,092	13,306	179,511	\$ 34.93	2.50%	333	\$ 194
UNY Gas	NiagaraMohawk Gas	Other Emergencies Total													
UNY Gas	NiagaraMohawk Gas	Related to Meter Reading Total	4,338	652	13.06%	16	8	13	68,710	5,215	56,394	\$ 34.93	2.50%	130	\$ 76
Total			1,544,638	279,607					42,790,129	3,550,425	19,621,525			88,761	\$ 51,673

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

The Narragansett Electric Company
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Benefits per Operating Company

Boston Gas **	\$	9,372
Colonial Gas **	\$	2,057
Brooklyn Union Gas (KEDNY)	\$	24,428
Keyspan Gas East (KEDLI)	\$	6,308
NiagaraMohawk Gas	\$	7,656
Narragansett Gas	\$	1,852
Total	\$	51,673

Assumptions / Sources / Notes

- 1 Source: CMS US FY18 Workplan; Annemarie Westerlind, CMS Resource Planning; jobs exclude collection and emergency / leak jobs
- 2 CMS Tech rate provided by NG Finance; hourly rate assumes an average for that category of employee if there were multiple titles / levels (e.g., Technician A, Technician B, etc.)
- 3 Reduction in UTCs of 2.5% agreed / confirmed for both travel time and mileage with Megan Picarretto and Danielle Morrissey
- 4 Boston Gas and Colonial Gas benefits split based on general allocator %s (Boston Gas - 82%, Colonial Gas - 18%)

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Improved Field Data Capture - CMS Meter Verification Jobs¹

State / Area	Job Code	Type of Work	Job Count FY 2014	Job Count FY 2015	Job Count FY 2016	3 Year Average	Average Minutes on the Job (mins)	Average Travel Time (mins)	Average Minutes on Job + Travel Time (mins)	Total Time (mins)	Field Tech Hourly Rate ²	Cost per Job	Cost Basis	Reduction in Meter Verification Jobs (%) ³	# of Jobs Reduced	Time Savings	Total Benefits
MA Gas	62	VERIFY MTR. INFO	3,041	1,336	2,729	2,569	21	14	35	89,903	\$ 34.93	\$ 20.37	\$ 52,333	37.50%	963	33,714	\$ 19,625
MA Elec	102	INVESTIGATION - Meter Number Verification	1,158	834	1,394	1,129	8	14	22	24,831	\$ 34.93	\$ 12.81	\$ 14,454	37.50%	423	9,312	\$ 5,420
RI Gas	102	INVESTIGATION - Meter Number Verification	400	441	693	511	13	14	27	13,806	\$ 34.93	\$ 15.72	\$ 8,036	37.50%	192	5,177	\$ 3,014
RI Elec	102	INVESTIGATION - Meter Number Verification	816	502	802	707	21	12	33	23,320	\$ 34.93	\$ 19.21	\$ 13,575	37.50%	265	8,745	\$ 5,090
NYC	62	VERIFY MTR. INFO	15,156	8,786	3,822	9,255	18	11	29	268,385	\$ 34.93	\$ 16.88	\$ 156,227	37.50%	3,671	100,645	\$ 58,585
LI	400	METER VERIFICATION	2,629	5,519	8,561	5,570	12	13	25	139,242	\$ 34.93	\$ 14.55	\$ 81,052	37.50%	2,089	52,216	\$ 30,395
UNY Gas	102	INVESTIGATION - Meter Number Verification	1,485	1,251	840	1,192	14	13	27	32,184	\$ 34.93	\$ 15.72	\$ 18,234	37.50%	447	12,069	\$ 7,025
UNY Elec	102	INVESTIGATION - Meter Number Verification	8,001	4,912	2,352	5,088	14	15	29	147,562	\$ 34.93	\$ 16.88	\$ 85,896	37.50%	1,908	55,336	\$ 32,211
Total						26,020	15	13	28	739,233	\$ 34.93	\$ 16.52	\$ 430,507		9,758	277,212	\$ 160,365

Operating Company ⁴		
Boston Gas		\$ 20,536.88
Colonial Gas		\$ 4,508.09
Brooklyn Union Gas (BEDNY)		\$ 58,585
Kospan Gas East (KEGU)		\$ 30,395
Narragansett Gas		\$ 39,236
Narragansett Gas		\$ 8,104
Total		\$ 161,365

Assumptions/Sources/Notes
¹ Source: CMS US F118 Worksheet; Anonymous Worksheet; CMS Resource Planning
² CMS Tech rate provided by NG Finance; hourly rate assumes an average for that category of employee if there were multiple rates / levels (e.g., Technician A, Technician B, etc.)
³ # of meter verification jobs could be reduced by 37.5% and 90% by better data capture upon installation (e.g., picture of meter #, serial #, etc.); agreed / confirmed with Megan Piccarreto
⁴ Boston Gas and Colonial Gas benefits split based on general allocator % (Boston Gas - 82%; Colonial Gas - 18%)

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Simplified / Automated Communications - CMS Planned Jobs (Appointment and non-Appointment) ¹

State / Area	Operating Companies	Job Types	2 Year Job Count Average	2 Year UTC Job Count Average	UTC % FY15 & FY16	Tech Hourly Rate ²	Minutes per Call ³	Reduction %	Total Saved Mins	Total CMS Tech Calls Benefits
LI	Keyspan Gas East (KEDLI)	Customer Driven Construction Total	9,187	633	6.45%	\$ 34.93	1	25.00%	2,455	\$ 1,429
LI	Keyspan Gas East (KEDLI)	Field Collections Total								
LI	Keyspan Gas East (KEDLI)	Gas Leak Investigation Total								
LI	Keyspan Gas East (KEDLI)	Inner-Tite Total	498	153	23.50%	\$ 34.93	1	25.00%	163	\$ 95
LI	Keyspan Gas East (KEDLI)	Investigations Total	3,498	2,673	43.32%	\$ 34.93	1	25.00%	1,543	\$ 898
LI	Keyspan Gas East (KEDLI)	Meter Changes (Capital) Total	19,980	3,801	15.98%	\$ 34.93	1	25.00%	5,945	\$ 3,461
LI	Keyspan Gas East (KEDLI)	Meter Oriented Services Total	74,040	9,487	11.36%	\$ 34.93	1	25.00%	20,882	\$ 12,157
LI	Keyspan Gas East (KEDLI)	Meter/Regulator Work total	4,760	1,757	26.96%	\$ 34.93	1	25.00%	1,629	\$ 948
LI	Keyspan Gas East (KEDLI)	Misc. - Capital Total	15,326	2,527	14.16%	\$ 34.93	1	25.00%	4,463	\$ 2,598
LI	Keyspan Gas East (KEDLI)	Other Emergency Total								
LI	Keyspan Gas East (KEDLI)	Related to Meter Reading Total	31,613	6,104	16.18%	\$ 34.93	1	25.00%	9,429	\$ 5,489
MA Electric	Boston Gas / Colonial Gas	Customer Driven Construction	5,822	388	6.25%	\$ 34.93	1	25.00%	1,553	\$ 904
MA Electric	Boston Gas / Colonial Gas	Field Collections								
MA Electric	Boston Gas / Colonial Gas	Investigations Total	19,419	3,832	16.48%	\$ 34.93	1	25.00%	5,813	\$ 3,384
MA Electric	Boston Gas / Colonial Gas	Meter Change - Capital Total	31,076	2,240	6.72%	\$ 34.93	1	25.00%	8,329	\$ 4,849
MA Electric	Boston Gas / Colonial Gas	Meter Change - O&M Total	289	100	25.66%	\$ 34.93	1	25.00%	97	\$ 57
MA Electric	Boston Gas / Colonial Gas	Meter Oriented Services Total	82,648	3,105	3.62%	\$ 34.93	1	25.00%	21,438	\$ 12,481
MA Electric	Boston Gas / Colonial Gas	Misc. - Capital Total	4,042	373	8.45%	\$ 34.93	1	25.00%	1,104	\$ 643
MA Electric	Boston Gas / Colonial Gas	Other Emergency								
MA Electric	Boston Gas / Colonial Gas	Related to Meter Reading Total	11,671	1,119	8.75%	\$ 34.93	1	25.00%	3,198	\$ 1,862
MA Gas	Boston Gas / Colonial Gas	Capital Fitting	32,689	6,551	16.70%	\$ 34.93	1	25.00%	9,810	\$ 5,711
MA Gas	Boston Gas / Colonial Gas	Customer Driven Construction Total	6,164	805	11.55%	\$ 34.93	1	25.00%	1,742	\$ 1,014
MA Gas	Boston Gas / Colonial Gas	Digsafe Total	668	-	0.00%	\$ 34.93	1	25.00%	167	\$ 97
MA Gas	Boston Gas / Colonial Gas	Field Collections Total								
MA Gas	Boston Gas / Colonial Gas	Gas Leak Investigation Total								
MA Gas	Boston Gas / Colonial Gas	Inner-Tite Inspection	1,024	910	47.06%	\$ 34.93	1	25.00%	484	\$ 282
MA Gas	Boston Gas / Colonial Gas	Inside Inspections Total	4,476	2,096	31.90%	\$ 34.93	1	25.00%	1,643	\$ 957
MA Gas	Boston Gas / Colonial Gas	Investigations Total	43,066	-	0.00%	\$ 34.93	1	25.00%	10,766	\$ 6,268
MA Gas	Boston Gas / Colonial Gas	Meter Change - O&M Total	99,716	26,917	21.26%	\$ 34.93	1	25.00%	31,658	\$ 18,430
MA Gas	Boston Gas / Colonial Gas	Meter Oriented Services Total	62,189	16,398	20.87%	\$ 34.93	1	25.00%	19,647	\$ 11,438
MA Gas	Boston Gas / Colonial Gas	Meter/Regulator Work total	6,796	548	7.46%	\$ 34.93	1	25.00%	1,836	\$ 1,069
MA Gas	Boston Gas / Colonial Gas	Misc. Capital Total	13,969	4,320	23.62%	\$ 34.93	1	25.00%	4,572	\$ 2,662
MA Gas	Boston Gas / Colonial Gas	Other Emergency Total								
MA Gas	Boston Gas / Colonial Gas	Related to Meter Reading Total	2,618	1,318	33.49%	\$ 34.93	1	25.00%	984	\$ 573
NYC	Brooklyn Union Gas (KEDNY)	Customer Driven Construction Total	10,308	1,317	11.33%	\$ 34.93	1	25.00%	2,906	\$ 1,692
NYC	Brooklyn Union Gas (KEDNY)	Field Collections Total								
NYC	Brooklyn Union Gas (KEDNY)	Gas Leak Investigation Total								
NYC	Brooklyn Union Gas (KEDNY)	Inner Tite Inspection Total	8,150	17,290	67.97%	\$ 34.93	1	25.00%	6,360	\$ 3,703
NYC	Brooklyn Union Gas (KEDNY)	Investigations Total	55,174	-	0.00%	\$ 34.93	1	25.00%	13,794	\$ 8,030
NYC	Brooklyn Union Gas (KEDNY)	Meter Change - Capital Total	12,233	870	6.64%	\$ 34.93	1	25.00%	3,276	\$ 1,907
NYC	Brooklyn Union Gas (KEDNY)	Meter Oriented Services Total	185,551	64,290	25.73%	\$ 34.93	1	25.00%	62,460	\$ 36,362
NYC	Brooklyn Union Gas (KEDNY)	Meter/Regulator Work total	4,005	536	11.81%	\$ 34.93	1	25.00%	1,135	\$ 661
NYC	Brooklyn Union Gas (KEDNY)	Misc. - Capital Total	46,066	11,975	20.63%	\$ 34.93	1	25.00%	14,510	\$ 8,447
NYC	Brooklyn Union Gas (KEDNY)	Other Emergency Total								
NYC	Brooklyn Union Gas (KEDNY)	Related to Meter Reading Total	6,304	2,454	28.02%	\$ 34.93	1	25.00%	2,190	\$ 1,275
NYC	Brooklyn Union Gas (KEDNY)	Surveillance Total	113,630	-	0.00%	\$ 34.93	1	25.00%	28,408	\$ 16,538
RI Electric	Narragansett Electric	Customer Driven Construction	2,239	129	5.45%	\$ 34.93	1	25.00%	592	\$ 345
RI Electric	Narragansett Electric	Field Collections								
RI Electric	Narragansett Electric	Investigations Total	7,476	1,090	12.72%	\$ 34.93	1	25.00%	2,141	\$ 1,247
RI Electric	Narragansett Electric	Meter Change - Capital Total	10,760	1,194	9.99%	\$ 34.93	1	25.00%	2,989	\$ 1,740
RI Electric	Narragansett Electric	Meter Change - O&M Total	418	131	23.91%	\$ 34.93	1	25.00%	137	\$ 80
RI Electric	Narragansett Electric	Meter Oriented Services Total	42,077	931	2.17%	\$ 34.93	1	25.00%	10,752	\$ 6,259
RI Electric	Narragansett Electric	Misc. - Capital Total	1,794	54	2.95%	\$ 34.93	1	25.00%	462	\$ 269
RI Electric	Narragansett Electric	Other Emergency Total								
RI Electric	Narragansett Electric	Related to Meter Reading Total	4,600	904	16.42%	\$ 34.93	1	25.00%	1,376	\$ 801
RI Gas	Narragansett Gas	Capital Piping	10,473	45	0.43%	\$ 34.93	1	25.00%	2,629	\$ 1,531
RI Gas	Narragansett Gas	Customer Driven Construction	3,416	1,687	33.06%	\$ 34.93	1	25.00%	1,276	\$ 743
RI Gas	Narragansett Gas	Field Collections Total								
RI Gas	Narragansett Gas	Gas Leak Investigation Total								
RI Gas	Narragansett Gas	Investigations Total	5,530	1,356	19.70%	\$ 34.93	1	25.00%	1,721	\$ 1,002
RI Gas	Narragansett Gas	Meter Change O&M Total	10,534	5,259	33.30%	\$ 34.93	1	25.00%	3,948	\$ 2,299
RI Gas	Narragansett Gas	Meter Oriented Service	34,738	3,696	9.62%	\$ 34.93	1	25.00%	9,608	\$ 5,594
RI Gas	Narragansett Gas	Misc Capital Total	92	6	6.63%	\$ 34.93	1	25.00%	24	\$ 14
RI Gas	Narragansett Gas	Other Emergency Total								
RI Gas	Narragansett Gas	Related to Meter Reading	2,573	531	17.10%	\$ 34.93	1	25.00%	776	\$ 452

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Simplified / Automated Communications - CMS Planned Jobs (Appointment and non-Appointment) ¹

State / Area	Operating Companies	Job Types	2 Year Job Count Average	2 Year UTC Job Count Average	UTC % FY15 & FY16	Tech Hourly Rate ²	Minutes per Call ³	Reduction %	Total Saved Mins	Total CMS Tech Calls Benefits
UNY Electric	NiagaraMohawk Electric	Customer Driven Construction	7,972	2,248	22.00%	\$ 34.93	1	25.00%	2,555	\$ 1,487
UNY Electric	NiagaraMohawk Electric	Field Collections Total								
UNY Electric	NiagaraMohawk Electric	Investigations Total	35,532	4,805	11.91%	\$ 34.93	1	25.00%	10,084	\$ 5,871
UNY Electric	NiagaraMohawk Electric	Meter Change - Capital Total	23,099	4,261	15.57%	\$ 34.93	1	25.00%	6,840	\$ 3,982
UNY Electric	NiagaraMohawk Electric	Meter Change - O&M Total	374	79	17.45%	\$ 34.93	1	25.00%	113	\$ 66
UNY Electric	NiagaraMohawk Electric	Meter Oriented Services Total	154,413	25,932	14.38%	\$ 34.93	1	25.00%	45,086	\$ 26,248
UNY Electric	NiagaraMohawk Electric	Misc. - Capital Total	5,428	603	10.00%	\$ 34.93	1	25.00%	1,508	\$ 878
UNY Electric	NiagaraMohawk Electric	Other Emergencies Total								
UNY Electric	NiagaraMohawk Electric	Related to Meter Reading Total	8,394	1,254	13.00%	\$ 34.93	1	25.00%	2,412	\$ 1,404
UNY Gas	NiagaraMohawk Gas	Customer Driven Construction	6,469	2,975	31.50%	\$ 34.93	1	25.00%	2,361	\$ 1,374
UNY Gas	NiagaraMohawk Gas	Field Collections Total								
UNY Gas	NiagaraMohawk Gas	Gas Leak Investigation Total								
UNY Gas	NiagaraMohawk Gas	Investigations Total	17,384	3,291	15.92%	\$ 34.93	1	25.00%	5,169	\$ 3,009
UNY Gas	NiagaraMohawk Gas	Meter Change - Capital Total	20,365	5,810	22.20%	\$ 34.93	1	25.00%	6,544	\$ 3,809
UNY Gas	NiagaraMohawk Gas	Meter Change O&M Total	3,036	426	12.29%	\$ 34.93	1	25.00%	865	\$ 504
UNY Gas	NiagaraMohawk Gas	Meter Oriented Services Total	78,652	11,753	13.00%	\$ 34.93	1	25.00%	22,601	\$ 13,158
UNY Gas	NiagaraMohawk Gas	Meter/Regulator Work		-	39.00%	\$ 34.93	1	25.00%	-	\$ -
UNY Gas	NiagaraMohawk Gas	Misc. - Capital Total	13,809	1,663	10.75%	\$ 34.93	1	25.00%	3,868	\$ 2,252
UNY Gas	NiagaraMohawk Gas	Other Emergencies Total								
UNY Gas	NiagaraMohawk Gas	Related to Meter Reading Total	4,338	652	13.06%	\$ 34.93	1	25.00%	1,247	\$ 726
Total			1,544,638	279,654					456,073	\$ 265,511

Operating Company ⁴

Boston Gas **	\$ 59,596
Colonial Gas **	\$ 13,082
Brooklyn Union Gas (KEDNY)	\$ 78,615
Keyspan Gas East (KEDLI)	\$ 27,076
NiagaraMohawk Gas	\$ 64,768
Narragansett Gas	\$ 22,374
Total	\$ 265,511

Assumptions / Sources / Notes

1 Source: CMS US FY18 Workplan; Annemarie Westerlind, CMS Resource Planning; jobs exclude collection and emergency / leak jobs

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

3 Minutes per call estimated to be 1 minute; potential reduction in calls estimated to be 25% based on customer preferences for text messaging which can be automated; agreed / confirmed with Megan Picaretto and Danielle Morrissey

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

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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	25.00%	\$ 25.09	\$ 830,882
Colonial Gas Company	17	240	4,080	\$ 818,840	25.00%	\$ 25.09	\$ 204,710
Brooklyn Union Gas-KEDNY	28	240	6,720	\$ 1,348,678	25.00%	\$ 25.09	\$ 337,170
KS Gas East Corp-KEDLI	22	240	5,280	\$ 1,059,676	25.00%	\$ 25.09	\$ 264,919
Narragansett Electric Co	15	240	3,600	\$ 722,506	25.00%	\$ 25.09	\$ 180,627
Niagara Mohawk Power Corp	26	240	6,240	\$ 1,252,344	25.00%	\$ 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.)

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Reduced Summonses Fines - M&C All Construction Jobs (NYC) ¹

Code	Description	Cost: Pre-implementation	% of Total	Cum % of Total	Primary Reduction Driver ²	% Reduction ³	Value of Reduction	Remaining Summonses
D01	Use/Opening of street w/o a permit	\$2,806,500	25.21%	25.21%	EAM, Scheduling Platform, Process Change	40.00%	\$ 1,122,600	\$1,683,900
D30	Failure to comply with the terms and conditions	\$2,241,700	20.13%	45.34%	Supervisor in the Field, Performance Management	40.00%	\$ 896,680	\$1,345,020
D4F	Failure to permanently restore cut within required time	\$1,193,011	10.71%	56.05%	EAM, Scheduling Platform, Process Change	40.00%	\$ 477,204	\$715,807
D09	Materials/Equipment on street w/o permit	\$1,004,101	9.02%	65.07%	EAM, Scheduling Platform, Process Change	40.00%	\$ 401,640	\$602,461
D4G	Improper skid resistant plate	\$650,850	5.85%	70.92%	Technical Training, Work Methods	40.00%	\$ 260,340	\$390,510
D05	Failure to provide adequate protection at worksite	\$480,350	4.31%	75.23%	Supervisor in the Field, Performance Management	40.00%	\$ 192,140	\$288,210
D4E	Plates not pinned and ramped	\$456,000	4.10%	79.33%	Technical Training, Work Methods	40.00%	\$ 182,400	\$273,600
D02	Protected street opening without a permit	\$430,600	3.87%	83.20%	EAM, Scheduling Platform, Process Change	40.00%	\$ 172,240	\$258,360
DD5	Binder base or temporary restoration not flush with surrounding area	\$315,500	2.83%	86.03%	Technical Training, Work Methods	40.00%	\$ 126,200	\$189,300
D1E	Temp pavement not flush with surrounding area	\$269,100	2.42%	88.45%	Technical Training, Work Methods	40.00%	\$ 107,640	\$161,460
D03	Street closing without a permit	\$234,030	2.10%	90.55%	EAM, Scheduling Platform, Process Change	40.00%	\$ 93,612	\$140,418
D70	No raised plow sign/steel plates or fail to count	\$208,750	1.87%	92.42%	EAM, Scheduling Platform, Process Change	40.00%	\$ 83,500	\$125,250
D1F	Wearing course not flush with surrounding area	\$146,500	1.32%	93.74%	Technical Training, Work Methods	40.00%	\$ 58,600	\$87,900
D1J	No confirmation number before expiration of permit	\$91,500	0.82%	94.56%	EAM, Scheduling Platform, Process Change	40.00%	\$ 36,600	\$54,900
D10	Debris/Constr. Material obstructing gutter/sidewalk	\$64,750	0.58%	95.14%	Technical Training, Work Methods	40.00%	\$ 25,900	\$38,850
D5F	Failure to comply with DOT standard specs.	\$54,150	0.49%	95.63%	Technical Training, Work Methods	40.00%	\$ 21,660	\$32,490
D5D	Failure to display required signs at worksite	\$49,300	0.44%	96.07%	Supervisor in the Field, Performance Management	40.00%	\$ 19,720	\$29,580
D2A	Utility cover/st h/w not flush with surrounding area	\$46,500	0.42%	96.49%	Technical Training, Work Methods	40.00%	\$ 18,600	\$27,900
D6E	Failure to begin emergency work in 2 hrs after authorization	\$31,000	0.28%	96.77%	EAM, Scheduling Platform, Process Change	40.00%	\$ 12,400	\$18,600
D1B	No notice to DOT before start phase of work on protected street	\$30,250	0.27%	97.04%	EAM, Scheduling Platform, Process Change	40.00%	\$ 12,100	\$18,150
D5B	Failure to restore lane markings	\$30,000	0.27%	97.31%	Technical Training, Work Methods	40.00%	\$ 12,000	\$18,000
DB1	Failure to restore street in kind (non-historic district)	\$28,500	0.26%	97.56%	Technical Training, Work Methods	40.00%	\$ 11,400	\$17,100
D16	Sand/dirt/debris not removed from site	\$26,750	0.24%	97.80%	Technical Training, Work Methods	40.00%	\$ 10,700	\$16,050
D5A	Failure to seal street opening joints	\$24,250	0.22%	98.02%	Technical Training, Work Methods	40.00%	\$ 9,700	\$14,550
D69	Failure to seal joints	\$23,500	0.21%	98.23%	Technical Training, Work Methods	40.00%	\$ 9,400	\$14,100
D15	Obstruction of fire hydrant or bus stop	\$22,550	0.20%	98.44%	Technical Training, Work Methods	40.00%	\$ 9,020	\$13,530
Blank	None	\$17,961	0.16%	98.60%				\$17,961
D7A	Failure to apply for permit w/ 2 bus days of emergency work	\$17,000	0.15%	98.75%	EAM, Scheduling Platform, Process Change	40.00%	\$ 6,800	\$10,200
D7F	Driving lane excavation not plated	\$16,800	0.15%	98.90%	Technical Training, Work Methods	40.00%	\$ 6,720	\$10,080
D6D	Doing non-emergency with an emergency authorization number	\$16,000	0.14%	99.04%	EAM, Scheduling Platform, Process Change	40.00%	\$ 6,400	\$9,600
D8C	Failure to replace loose, slipper, or broken utility maintenance hol	\$14,750	0.13%	99.18%	Technical Training, Work Methods	40.00%	\$ 5,900	\$8,850
D1G	Temporary cut sunken	\$12,500	0.11%	99.29%	Technical Training, Work Methods	40.00%	\$ 5,000	\$7,500
D3D	Working on an embargoed street	\$10,800	0.10%	99.39%	EAM, Scheduling Platform, Process Change	40.00%	\$ 4,320	\$6,480
DA1	Failure to fully replace defective s/w flag	\$8,750	0.08%	99.47%	Technical Training, Work Methods	40.00%	\$ 3,500	\$5,250
DB2	Installing r/w markings, parking, const, or regulatory signs w/o a perm	\$7,050	0.06%	99.53%	EAM, Scheduling Platform, Process Change	40.00%	\$ 2,820	\$4,230
D11	Construction materials/equipment w/o proper reflective markings	\$6,750	0.06%	99.59%	Technical Training, Work Methods	40.00%	\$ 2,700	\$4,050
D3K	Failure to defective hardware extending 12" from perimeter	\$6,000	0.05%	99.64%	Technical Training, Work Methods	40.00%	\$ 2,400	\$3,600
DA2	Failure to install pedestrian ramp as per DOT drawings	\$5,200	0.05%	99.69%	Technical Training, Work Methods	40.00%	\$ 2,080	\$3,120
D5E	Failure to post flag-person at worksite to give d	\$4,800	0.04%	99.73%	EAM, Scheduling Platform, Process Change	40.00%	\$ 1,920	\$2,880
DB5	Failure to install a color coding marker upon completion of the res	\$3,250	0.03%	99.76%	Technical Training, Work Methods	40.00%	\$ 1,300	\$1,950
DD3	Divisible construction - materials or equipment stored higher than	\$2,500	0.02%	99.78%	Technical Training, Work Methods	40.00%	\$ 1,000	\$1,500
DB4	Installing asphalt on a concrete st. or concrete bus stop area	\$2,100	0.02%	99.80%	Technical Training, Work Methods	40.00%	\$ 840	\$1,260
D4D	Unsuitable backfill material used	\$2,000	0.02%	99.82%	Technical Training, Work Methods	40.00%	\$ 800	\$1,200
D5C	Failure to apply color code identifying permittee	\$1,500	0.01%	99.83%	Supervisor in the Field, Performance Management	40.00%	\$ 600	\$900
DD4	Installation and compaction of binder in greater than four inch lifts	\$1,500	0.01%	99.85%	Technical Training, Work Methods	40.00%	\$ 600	\$900
DD7	Fail to conform with Standard details 1042A/1042B/1042C - prote	\$1,500	0.01%	99.86%	Technical Training, Work Methods	40.00%	\$ 600	\$900
D01P	No valid permit for paving	\$1,500	0.01%	99.88%	EAM, Scheduling Platform, Process Change	40.00%	\$ 600	\$900
D4B	Excavation down 5 feet or greater w/o shoring	\$1,500	0.01%	99.89%	Technical Training, Work Methods	40.00%	\$ 600	\$900
D2F	Construction shanty/trailer w/o permit	\$1,350	0.01%	99.90%	EAM, Scheduling Platform, Process Change	40.00%	\$ 540	\$810
D31	Defacement of roadway or sidewalk	\$1,200	0.01%	99.91%	Technical Training, Work Methods	40.00%	\$ 480	\$720
D4C	Banners w/o permit	\$1,200	0.01%	99.92%	EAM, Scheduling Platform, Process Change	40.00%	\$ 480	\$720
D6F	Failure to perform emergency work around clock	\$1,200	0.01%	99.93%	EAM, Scheduling Platform, Process Change	40.00%	\$ 480	\$720
DA9	Failure to restore entire pavement between st. opening and curb	\$800	0.01%	99.94%	Technical Training, Work Methods	40.00%	\$ 320	\$480
D40	Backfilling protected street w/o inspector	\$800	0.01%	99.95%	Supervisor in the Field, Performance Management	40.00%	\$ 320	\$480
D68	Failure to install expansion joints	\$750	0.01%	99.95%	Technical Training, Work Methods	40.00%	\$ 300	\$450
D06	Identify signs improperly displayed or missing	\$750	0.01%	99.96%	Supervisor in the Field, Performance Management	40.00%	\$ 300	\$450
D54	Failure to comply with DOT standard specs.	\$750	0.01%	99.97%	Supervisor in the Field, Performance Management	40.00%	\$ 300	\$450
DD6	Fail to conform with standard details 1042A/1042B/1042C - Conc	\$750	0.01%	99.97%	Technical Training, Work Methods	40.00%	\$ 300	\$450
D14	No street protection under construction materials/equipment	\$500	0.00%	99.98%	Supervisor in the Field, Performance Management	40.00%	\$ 200	\$300
D1C	Failure to notify public service corp prior to excavation	\$500	0.00%	99.98%	Supervisor in the Field, Performance Management	40.00%	\$ 200	\$300
DA8	Failure to provide minimum thickness of wearing course on full de	\$400	0.00%	99.99%	Technical Training, Work Methods	40.00%	\$ 160	\$240
D1A	Failure to provide adequate protection at worksite	\$250	0.00%	99.99%	Supervisor in the Field, Performance Management	40.00%	\$ 100	\$150
D2C	Failure to provide space for loading & unloading of materials	\$250	0.00%	99.99%	Supervisor in the Field, Performance Management	40.00%	\$ 100	\$150
D2D	Crossing sidewalk with a motorized vehicle w/o a permit	\$250	0.00%	99.99%	Supervisor in the Field, Performance Management	40.00%	\$ 100	\$150
D3C	Failure to maintain a 5FT pedestrian walkway on street	\$250	0.00%	100.00%	Technical Training, Work Methods	40.00%	\$ 100	\$150
D3E	Failure to restore pavement/curb/gutter/s/w/in ki	\$250	0.00%	100.00%	Technical Training, Work Methods	40.00%	\$ 100	\$150
D12	Materials/equipment w/o name & address of owner	\$200	0.00%	100.00%	Supervisor in the Field, Performance Management	40.00%	\$ 80	\$120
Total		\$11,134,103	100.00%	100.00%			\$ 4,446,457	\$ 6,687,646

Assumptions / Sources / Notes

1 Source: Timothy Posillico, E2E Projects Gas

2 Driver of summons estimated based on initiatives being implemented as part of GBP (e.g., Technical Training, Work Methods) and used to determine what is addressable by GBE improvements

2 Estimate of % productivity improvement as result of GBE capabilities estimated / agreed with Timothy Posillico / Mark Scapattoti

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

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
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Reduction in Data Cleansing / Scrubbing - Analysts

State / OpCo	# of Analysts ¹
NG Service CO - MA	64
NG Service CO - NY	81
NG Service CO - RI	7
Brooklyn Union Gas-KEDNY	1
KS Gas East Corp-KEDLI	2
Niagara Mohawk Power Corp	8
Total	163

	# of Analysts	% Increase in Productive Time -Base ²	# of Annual Workdays	Total Annual Analyst Workdays	Hourly Rate ³	Total \$	Benefit \$
Benefity by Operating Company *							
Boston Gas	52	7.50%	240	12,552	\$ 32.44	\$ 3,257,362	\$ 244,302
Colonial Gas	12	7.50%	240	2,808	\$ 32.44	\$ 728,676	\$ 54,651
Brooklyn Union Gas (KEDNY)	39	7.50%	240	9,370	\$ 32.44	\$ 2,431,596	\$ 182,370
Keyspan Gas East (KEDLI)	29	7.50%	240	7,017	\$ 32.44	\$ 1,820,867	\$ 136,565
NiagaraMohawk Gas	24	7.50%	240	5,693	\$ 32.44	\$ 1,477,466	\$ 110,810
Narragansett Gas	7	7.50%	240	1,680	\$ 32.44	\$ 435,973	\$ 32,698
Total	163					\$ 10,151,941	\$ 761,396

General Allocators	General	NE Split	NY Split
Boston Gas	23.29%	81.72%	
Colonial Gas	5.21%	18.28%	
Brooklyn Union Gas (KEDNY)	30.10%		46.97%
Keyspan Gas East (KEDLI)	21.55%		33.62%
NiagraMohawk Gas	12.44%		19.41%
Narragansett Gas	7.41%		

Assumptions / Sources / Notes

1 # of Analysts derived from HRIS extract provided by J'Wynn DeRamos; resources with Analyst in their titles were counted in this analysis

2 Estimate of % productivity improvement as result of having improved data quality and completeness estimated / agreed with Moon Fong Tsui (Manager Data Management), Jorge Calzada (Director Business Process Adv Analytics), and Nick Raad

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

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Avoided Penalties via Improved Estimating Accuracy - M&C Complex Engineering Jobs

Threshold	Penalty ¹	
= or > 80%	\$ -	
70-80%	\$ 200,000	
60-70%	\$ 500,000	< - Improved estimating accuracy after the project
< 60%	\$ 1,100,000	< - Baseline

Benefity by Operating Company *	Baseline	Reduced fined - by Increasing accuracy to 60- 70% ²
Boston Gas	\$ -	\$ -
Colonial Gas	\$ -	\$ -
Brooklyn Union Gas (KEDNY)	\$ -	\$ -
Keyspan Gas East (KEDLI)	\$ -	\$ -
NiagaraMohawk Gas	\$ 1,100,000	\$ 600,000
Narragansett Gas	\$ -	\$ -
Total	\$ 1,100,000	\$ 600,000

Assumptions / Sources / Notes

1 Penalty defined as part of the rate case agreement with Niagara Mohawk, penalty in effect FY17

2 Estimate of benefits based on an analysis of estimating accuracy completed by Pavel Ozhogin, Sr Quantitative Analyst, Advanced Analytics, 2016, results show current estimating accuracy well below 60% threshold

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Improved Engineering Productivity - M&C Complex Engineering Jobs

	FTEs Performing Complex	Unloaded Cost Rate ³	Annual Available Productive	Estimated Non Value Added Work	Savings Rate (Mid Point of Suggested Range)	Hours Saved per Year	\$ of Capacity
NE	40	\$ 52.53	60200	5% - 7.5%	6.25%	3,763	\$ 197,642
NY	60	\$ 52.53	90300	2.5% - 4%	3.25%	2,935	\$ 154,161
Total	100		150,500			6,697	\$ 351,803

Total Engineers ¹	190 FTEs (Per Headcount File)
Total Working on Complex Projects ²	100 FTEs
% Working on Complex Projects	53%

Benefit by Operating Company *

Boston Gas	\$ 128,184
Colonial Gas	\$ 28,675
Brooklyn Union Gas (KEDNY)	\$ 72,402
Keyspan Gas East (KEDLI)	\$ 51,836
NiagaraMohawk Gas	\$ 29,923
Narragansett Gas	\$ 40,783
Total	\$ 351,803

General Allocators	General	NE Split	NY Split
Boston Gas	23.29%	64.86%	
Colonial Gas	5.21%	14.51%	
Brooklyn Union Gas (KEDNY)	30.10%		46.97%
Keyspan Gas East (KEDLI)	21.55%		33.62%
NiagaraMohawk Gas	12.44%		19.41%
Narragansett Gas	7.41%	20.63%	
Total NE	35.91%	100.00%	
Total NY	64.09%		100.00%

Assumptions / Sources / Notes

- 1 # of Engineers derived from HRIS extract provided by J'Wynn DeRamos; resources with Engineer or a derivation in their title was counted in this analysis
- 2 Estimate of the # of Engineers performing complex design activities provided by Phil Di Giglio
- 3 Engineer rate provided by NG Finance; hourly rate assumes an average for that category of employee if there were multiple titles / levels (e.g., Engineer, Sr. Engineer, etc.)
- 4 Estimate of the productivity improvement due to new design and estimating tools, changes in roles to reduce non-design activities, and more streamlined processes provided by Phil Di Giglio
- 5 Benefits split by operating company using the general allocator; there is not enough information to conclude benefits at the operating company level

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

Op Co	Category	2013		2014		2015		3 Yr Average	% Reduction to Median ³	% Reduction Estimated for NG	Potential Savings
		# of Errors	Cost	# of Errors	Cost	# of Errors	Cost				
UNY	Mis-mark - Record Errors	4	\$ 14,354	38	\$ 89,690	41	\$ 241,907	\$ 115,317	87.50%	43.75%	\$ 50,451
UNY	Mis-mark - Locator Errors (Internal)		\$ -		\$ -		\$ -	\$ -	40.23%	20.11%	\$ -
NYC	Mis-mark - Record Errors	46	\$ 25,698	54	\$ 20,492	60	\$ 20,181	\$ 22,124	87.50%	43.75%	\$ 9,679
NYC	Mis-mark - Locator Errors (Internal)	3	\$ 700		\$ -		\$ -	\$ 233	40.23%	20.11%	\$ 47
LI	Mis-mark - Record Errors	52	\$ 84,517	63	\$ 514,509	70	\$ 169,928	\$ 256,318	87.50%	43.75%	\$ 112,139
LI	Mis-mark - Locator Errors (Internal)	4	\$ 5,339	6	\$ 15,866		\$ -	\$ 7,069	40.23%	20.11%	\$ 1,422
MMA	Mis-mark - Record Errors	139	\$ 465,112	139	\$ 379,541	123	\$ 300,815	\$ 381,823	87.50%	43.75%	\$ 167,048
MMA	Mis-mark - Locator Errors (Internal)	3	\$ 3,408	2	\$ 577		\$ -	\$ 1,328	40.23%	20.11%	\$ 267
RI	Mis-mark - Record Errors	23	\$ 376,726.87	29	\$ 475,003.44	45	\$ 737,074	\$ 529,602	87.50%	43.75%	\$ 231,701
RI	Mis-mark - Locator Errors (Internal)	1	\$ 1,884.92	2	\$ 3,769.84	1	\$ 1,885	\$ 2,513	40.23%	20.11%	\$ 506
Total	Total Mis-mark - Record Errors	264	\$ 966,409	323	\$ 1,479,236	339	\$ 1,469,905	\$ 1,305,183	87.50%	43.75%	\$ 571,018
Total	Total Mis-mark - Locator Errors	11	\$ 11,352	10	\$ 20,213	1	\$ 1,885	\$ 11,143	40.23%	20.11%	\$ 2,241
TOTAL								\$ 1,316,327			\$ 573,259

RI	Average Cost of Mis-mark - Record Errors	\$ 16,379
RI	Average Cost of Mis-mark - Locator Errors (Internal)	\$ 1,885

Damage Benchmarking ²	Grid Gas Performance - # of Damages	Quartile Ranking per AGA Gas Peers		Median per AGA Gas Peers	Range per AGA Gas Peers	of Damages Needed to Move to the
		1st	2nd			
Number of Damages due to Locate Errors – Mains	11			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%

Benefit 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%)

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Automate as-Builts

	Miles of Line / Pipe ¹	%
Electric	72,576	53.04%
Gas	64,268	46.96%
Total	136,844	100.00%

Benefit by Operating Company ²	# of Mappers	Gas Mappers ³	Gas Map Hours / Yr	Salary ⁴	Total \$	Reduction ⁵	Reduction: Hours	Reduction: FTEs	Benefits
Boston Gas	28	13	25,054	\$64,302	\$839,065	30.00%	7,516.12	3.91	\$ 251,720
Colonial Gas	6	3	5,605	\$64,302	\$187,700	30.00%	1,681.36	0.88	\$ 56,310
Brooklyn Union Gas (KEDNY)	18	8	15,951	\$64,302	\$534,197	30.00%	4,785.19	2.49	\$ 160,259
Keyspan Gas East (KEDLI)	7	3	6,312	\$64,302	\$211,393	30.00%	1,893.60	0.99	\$ 63,418
NiagaraMohawk Gas	7	3	6,592	\$64,302	\$220,778	30.00%	1,977.67	1.03	\$ 66,233
Narragansett Gas	5	2	4,509	\$64,302	\$150,995	30.00%	1,352.57	0.70	\$ 45,298
Total	71	33	64,022		\$2,144,127		19,207	10	\$ 643,238

General Allocators	General	MA Split	UNY NYC Split
Boston Gas	23.29%	81.72%	
Colonial Gas	5.21%	18.28%	
Brooklyn Union Gas (KEDNY)	30.10%		70.76%
Keyspan Gas East (KEDLI)	21.55%		
NiagaraMohawk Gas	12.44%		29.24%
Narragansett Gas	7.41%		
Total MA		28.50%	
Total NYC + UNY			42.54%

Assumptions / Sources / Notes

1 Source: AGA 2015 for miles of pipe; NG Full Year Report 2016 for electric distribution lines

2 Benefits split by operating company using the general allocator; there is not enough information to conclude benefits at the operating company level

3 # of gas mappers based on % of miles of mains and services relative to the total miles of mains, services, and electric distribution lines; key assumption is that reg stations and substations are of equal complexity

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

5 Estimate of the productivity improvement due to mobility solution provided by Mark Scaparotti

Reduction / Redirection in Opex

	FY2017 Controllable O&M ¹	% of Total Opex	% Reduction ²	Benefits
Boston Gas	\$ 76,358,000	31.76%	0.82%	\$ 628,814
Colonial Gas	\$ 10,443,000	4.34%	0.82%	\$ 85,999
Brooklyn Union Gas (KEDNY)	\$ 74,664,000	31.05%	0.82%	\$ 614,864
Keyspan Gas East (KEDLI)	\$ 25,587,000	10.64%	0.82%	\$ 210,711
NiagaraMohawk Gas	\$ 39,859,000	16.58%	0.82%	\$ 328,242
Narragansett Gas	\$ 13,524,000	5.62%	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

2 Estimated \$6M benefit provided by Phil Di Giglio

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Reduction in Service Quality Penalties - CMS All jobs

Category	KEDNY ¹					KEDLI ¹				
	2013	2014	2015	3 Year Avg.	Total at Risk	2013	2014	2015	3 Year Avg.	Total at Risk
PSC Complaint Rate	\$ -	\$ -	\$ -	\$ -	\$ 4,680,000	\$ -	\$ 3,960,000	\$ -	\$ 1,320,000	\$ 3,960,000
Customer Satisfaction	\$ -	\$ -	\$ -	\$ -	\$ 4,680,000	\$ 3,960,000	\$ 3,960,000	\$ -	\$ 2,640,000	\$ 3,960,000
Telephone Response within 30 seconds	\$ -	\$ -	\$ -	\$ -	\$ 1,170,000	N/A	N/A	N/A	\$ -	\$ 990,000
Adjusted Customer Bills	\$ -	\$ -	\$ -	\$ -	\$ 1,170,000	\$ -	\$ -	\$ -	\$ -	\$ 990,000
Residential Transaction Satisfaction Index										
Small/Medium C&I Transaction Satisfaction Index										
Gas Odor Call Response										
Service Appointments Met										
Customer Complaints										
Customer Service Guarantees										
Total	\$ -	\$ -	\$ -	\$ -	\$ 11,700,000	\$ 3,960,000	\$ 7,920,000	\$ -	\$ 3,960,000	\$ 9,900,000

Reduction in Service Quality Penalties - CMS All jobs

Category	NIMO ¹					Boston ¹				
	2013	2014	2015	3 Year Avg.	Total at Risk	2013	2014	2015	3 Year Avg.	Total at Risk
PSC Complaint Rate	\$ -	\$ -	\$ -	\$ -	\$ 7,830,000					
Customer Satisfaction	\$ -	\$ -	\$ -	\$ -	\$ -					
Telephone Response within 30 seconds	\$ -	\$ -	\$ -	\$ -	\$ 3,990,000					
Adjusted Customer Bills										
Residential Transaction Satisfaction Index	\$ -	\$ 2,539,688	\$ -	\$ 846,563	\$ 3,990,000					
Small/Medium C&I Transaction Satisfaction Index	\$ -	\$ -	\$ -	\$ -	\$ 3,990,000					
Gas Odor Call Response						\$ -	\$ -	\$ -	\$ -	2.5% of Trans & Dist Revenue
Service Appointments Met						\$ -	\$ -	\$ -	\$ -	\$ 2,200,000
Customer Complaints						\$ -	\$ -	\$ -	\$ -	\$ 900,000
Customer Service Guarantees						\$ 36,050	\$ 83,300	\$ 581,000	\$ 233,450	N/A
Total	\$ -	\$ 2,539,688	\$ -	\$ 846,563	\$ 19,800,000	\$ 36,050	\$ 83,300	\$ 581,000	\$ 233,450	\$ 3,100,000

Reduction in Service Quality Penalties - CMS All jobs

Category	Colonial ¹					Essex ¹				
	2013	2014	2015	3 Year Avg.	Total at Risk	2013	2014	2015	3 Year Avg.	Total at Risk
PSC Complaint Rate										
Customer Satisfaction										
Telephone Response within 30 seconds										
Adjusted Customer Bills										
Residential Transaction Satisfaction Index										
Small/Medium C&I Transaction Satisfaction Index										
Gas Odor Call Response	\$ -	\$ -	\$ -	\$ -	2.5% of Trans & Dist Revenue	\$ -	\$ -	\$ -	\$ -	2.5% of Trans & Dist Revenue
Service Appointments Met	\$ -	\$ -	\$ -	\$ -	\$ 2,200,000	\$ -	\$ -	\$ -	\$ -	\$ 2,200,000
Customer Complaints	\$ -	\$ -	\$ -	\$ -	\$ 900,000	\$ -	\$ -	\$ -	\$ -	\$ 900,000
Customer Service Guarantees	\$ 4,800	\$ 16,600	\$ 101,000	\$ 40,800	N/A	\$ 1,250	\$ 1,750	\$ 18,150	\$ 7,050	N/A
Total	\$ 4,800	\$ 16,600	\$ 101,000	\$ 40,800	\$ 3,100,000	\$ 1,250	\$ 1,750	\$ 18,150	\$ 7,050	\$ 3,100,000

Reduction in Service Quality Penalties - CMS All jobs

Category	Rhode Island				
	2013	2014	2015	3 Year Avg.	Total at Risk
PSC Complaint Rate					
Customer Satisfaction					
Telephone Response within 30 seconds					
Adjusted Customer Bills					
Residential Transaction Satisfaction Index					
Small/Medium C&I Transaction Satisfaction Index					
Gas Odor Call Response					
Service Appointments Met					
Customer Complaints					
Customer Service Guarantees					
Total	\$ -	\$ -	\$ -	\$ -	\$ -

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Operating Company	Service Quality Penalties - 3-YR. Avg.	Reduction in Service Quality Penalties *	Service Quality Benefits
Boston Gas	\$ 233,450	17.50%	\$ 40,854
Colonial Gas	\$ 40,800	17.50%	\$ 7,140
Brooklyn Union Gas (KEDNY)	\$ -	17.50%	\$ -
Keyspan Gas East (KEDLI)	\$ 3,960,000	17.50%	\$ 693,000
NiagaraMohawk Gas	\$ 846,563	17.50%	\$ 148,148
Narragansett Gas	\$ -	17.50%	\$ -
Total	\$ 5,080,813		\$ 889,142

Assumptions / Sources / Notes

1 KEDNY, KEDLI, and NIMO service quality metrics source: Patric O'Brien, Director Asst. General Counsel; MA service quality metrics: Tom Kubilis, Lead Analyst Gas Pipe Regulatory Compliance

2 17.5% of service quality penalties is estimated to be addressible by GBE solution scope; benefit estimated / provided by Megan Piccarreto

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Reduce Move Call Volume through Self-Service

OpCo	Monthly Calls (2013 - 2016 Average) ¹	Annual Calls (2013 - 2016 Average) ²	Cost Per Call ³	Total Cost	Assumed Avoided Call % ⁴	Total Benefit
Mass Electric	50,907	610,884	2.84	1,736,076.69	15.00%	\$ 260,412
NiagraMohawk Gas	55,751	669,012	3.80	2,543,430.19	15.00%	\$ 381,515
Keyspan Gas East (KEDLI)	13,937	167,244	3.80	635,823.33	15.00%	\$ 95,373
Narragansett Gas	6,942	83,304	4.25	354,105.71	15.00%	\$ 53,116
Boston Gas	20,600	247,200	2.84	702,519.88	15.00%	\$ 105,378
Colonial Gas	2,100	25,200	2.84	71,616.10	15.00%	\$ 10,742
Total	150,237	1,802,844		6,043,571.91		\$ 906,536

Benefity by Operating Company ⁵

Boston Gas *	\$ 318,915
Colonial Gas *	\$ 57,616
Brooklyn Union Gas (KEDNY) **	\$ -
Keyspan Gas East (KEDLI)	\$ 95,373
NiagaraMohawk Gas	\$ 381,515
Narragansett Gas	\$ 53,116
Total	\$ 906,536

Assumptions / Sources / Notes

1 Source: Call Center Actual / Budget Report; Megan Piccarreto; call volume did not include data for KEDNY

2 Annual calls calculated by taking the montly call average from 2013 to 2016 and multiplying by 12

3 Source: Call Center Actual / Budget Report

4 Avoided call % estimated using industry average self-service benefits; agreed / confirmed by Megan Piccarreto

5 MA Electric split across Boston Gas and Colonial Gas based on general allocator %s (Boston Gas - 82%, Colonial Gas - 18%)

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Reduce non-Move Call Volume through-Self Service

	Calls per Month ¹	Annual Calls ²	Field Related Calls ³	% of Addressable Field Related Calls ⁴	Addressable Calls	Avoided Call % ⁵	Avoided Calls	Cost Per Call ⁶	Benefits
Opco									
LI Gas	52,696	632,352	223,410	60.75%	135,729	10.00%	13,573	\$ 6.30	\$ 85,452
NiMo	113,187	1,358,249	479,869	60.75%	291,537	10.00%	29,154	\$ 4.26	\$ 124,270
KEDNY	144,149	1,729,788	611,134	60.75%	371,285	10.00%	37,128	\$ 5.08	\$ 188,594
MA Gas	70,622	847,461	299,408	60.75%	181,900	10.00%	18,190	\$ 4.49	\$ 81,716
MA Electric	71,533	858,398	303,272	60.75%	184,248	10.00%	18,425	\$ 3.74	\$ 68,990
RI Gas	11,318	135,811	47,982	60.75%	29,151	10.00%	2,915.07	\$ 4.75	\$ 13,857
RI Electric	22,819	273,823	96,742	60.75%	58,774	10.00%	5,877	\$ 4.32	\$ 25,391
Total	486,323	5,835,881	2,061,817		1,252,623		125,262		\$ 588,270

Benefity by Operating Company ⁷

Boston Gas	\$ 123,579
Colonial Gas	\$ 27,127
Brooklyn Union Gas (KEDNY)	\$ 188,594
Keyspan Gas East (KEDLI)	\$ 85,452
NiagaraMohawk Gas	\$ 124,270
Narragansett Gas	\$ 39,248
Total	\$ 588,270

Assumptions / Sources / Notes

1 Source: Call Center Actual / Budget Report; Megan Piccarreto

2 Call volume from November 2016 to March 2017 is assumed to be consistent with call volume from April 2016 to October 2016

3 Field related calls are determined by assessing the type of calls in the Service Tracker (2016) Report; estimate of field related calls to total non-move calls is 35.33%; field related calls are assumed to be appointments, collections, technician arrival time query, gas emergency, etc.

4 Calls that are assumed to be addressed via self service are customer driven appointments and status update calls only which represent 61% of the field related calls

5 Avoided call % estimated using industry average self-service benefits related to appointments and status updates; agreed / confirmed by Megan Piccarreto

1 Source: Call Center Actual / Budget Report

7 MA Gas and Electric split across Boston Gas and Colonial Gas based on general allocator %s (Boston Gas - 82%, Colonial Gas - 18%)

Supply Chain - Improved Project Delivery - Construction

Integrated Supply & Demand Planning - Construction Planning

Capital Project Budget - Gas Business ²	\$ 1,237,000,000
% capital project savings **	2.05%

	Baseline ^{3,4}	Reduction	Benefits
Boston Gas	\$ 5,915,660	10.0%	\$ 591,566
Colonial Gas	\$ 1,323,340	10.0%	\$ 132,334
Brooklyn Union Gas (KEDNY)	\$ 7,645,400	10.0%	\$ 764,540
Keyspan Gas East (KEDLI)	\$ 5,473,700	10.0%	\$ 547,370
NiagaraMohawk Gas	\$ 3,159,760	10.0%	\$ 315,976.00
Narragansett Gas	\$ 1,882,140	10.0%	\$ 188,214
Total	\$ 25,400,000.00		\$ 2,540,000

General Allocators

Boston Gas	23.29%
Colonial Gas	5.21%
Brooklyn Union Gas (KEDNY)	30.10%
Keyspan Gas East (KEDLI)	21.55%
NiagraMohawk Gas	12.44%
Narragansett Gas	7.41%

Assumptions / Sources / Notes

1 Source: NG_SCM End-to-End Transformation_Phase 1_Final Report_20160127_vDraft (6); NG_Phase 2 Overview for US Executive Team_042916_v1; provided by Joel Lynch

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

3 Benefits, benefits % of the baseline, and % to be allocated to each initiative provided by Joel Lynch

4 Benefits split by operating company using general allocator where there is not enough detail in the data set to conclude benefits by operating company

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Reduced Compliance and Gas Safety Penalties

	KEDNY ¹					KEDLI ¹				
	2013	2014	2015	3 Year Average	Total at Risk (2016)	2013	2014	2015	3 Year Average	Total at Risk (2016)
Records Violations- High Risk	X	X	X							
Records Violations- Other	X	X	X							
HEFPA										
Warning Tags										
Internal Corrosion										
20 Year Regulator Inspections										
Inactive Services										
Public Building Inspection										
Leak Classification or Mitigation	X	X	X							
Leak Repair or Surveillance	X	X	X							
Warning Tag Classification			X							
MA Gas Compliance Work Plan										
Corrosion- Annual Inspection	X	X	X							
Service Atmospheric Inspection	X		X							
Pressure Charts - Company Name		X								
Total Compliance	\$ 2,700,000	\$ 5,400,000	\$ 6,200,000	\$ 4,766,667	\$18,000,000	TBD	TBD	TBD	TBD	TBD

Reduced Compliance and Gas Safety Penalties

	NIMO ¹					MA ¹				
	2013	2014	2015	3 Year Average	Total at Risk (2016)	2013	2014	2015	3 Year Average	Total at Risk
Records Violations- High Risk	X	X	X							
Records Violations- Other										
HEFPA	X		X							
Warning Tags	X	X	X							
Internal Corrosion		X								
20 Year Regulator Inspections		X								
Inactive Services			X							
Public Building Inspection			X							
Leak Classification or Mitigation	X	X	X							
Leak Repair or Surveillance	X	X	X							
Warning Tag Classification	X	X	X							
MA Gas Compliance Work Plan										
Corrosion- Annual Inspection										
Service Atmospheric Inspection										
Pressure Charts - Company Name										
Total Compliance	\$ 9,000,000	\$ 9,000,000	\$5,700,000	\$7,900,000	\$ 9,000,000	\$ 486,000	\$ 160,000	\$1,355,000	\$ 667,000	

Reduced Compliance and Gas Safety Penalties

Operating Company ²	3 Year Average	Benefits ³
Boston Gas Company	\$ 545,068	\$ 545,068
Colonial Gas Company	\$ 121,932	\$ 121,932
Brooklyn Union Gas-KEDNY	\$ 4,766,667	\$ 4,766,667
KS Gas East Corp-KEDLI	TBD	TBD
Niagara Mohawk Power Corp	\$ 7,900,000	\$ 7,900,000
Narragansett Electric Co	\$ 187,133	\$ 187,133
Total	\$ 13,520,800	\$ 13,520,800

General Allocators	All	MA
Boston Gas	23.29%	81.72%
Colonial Gas	5.21%	18.28%
Brooklyn Union Gas (KEDNY)	30.10%	
Keyspan Gas East (KEDLI)	21.55%	
NiagraMohawk Gas	12.44%	
Narragansett Gas	7.41%	
Total	100.00%	28.50%

Assumptions / Sources / Notes

1 KEDNY, KEDLI, and NIMO gas safety and compliance metrics source: Patric O'Brien, Director Asst. General Counsel; MA metrics: Amy Smith, Director Pipeline Safety; RI metrics: Deb Byron, Lead Program Manager Pipeline Safety

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

3 100% reduction in penalties agreed by Johnny Johnston

Division 12-4

Request:

Referring to the response to Attachment DIV 3-53-2, page 7 of 10 and throughout the attachments, please describe the Company's experience in deploying systems using the Agile Delivery Methodology on past projects.

Response:

In the U.S., National Grid has experience with deployment of information-systems projects using Agile Delivery Methodology including:

- The redesign of NationalGridUS.com (2016);
- Replacement of legacy middleware with Comprehensive Integration Services (2017); and
- Analytics and Data Visualization (2017).

In addition, to execute the Agile Delivery Methodology on a larger scale to facilitate implementation of the Gas Business Enablement Program, National Grid has taken the following steps:

- Key members of the Gas Business Enablement Program are new hires to National Grid with direct experience in utilizing the Agile Delivery Methodology in prior large-scale projects.
- National Grid trained the core program team on the Agile Delivery Methodology well in advance of the anticipated start of the program. This training was provided by a recognized industry expert on Agile Delivery training and adoption.
- The Gas Business Enablement Program team used the Agile Delivery Methodology with pre-initiation preparation activities to gain hands-on experience. These activities were executed with "coaches" from the Agile Delivery training firm.
- Gas Business Enablement consulting partners were selected partly because of their experience with the Agile Delivery Methodology, bringing further expertise into the program.

Division 12-5

Request:

Referring to the response to Attachment DIV 3-53-4, page 3 of 9 “the work will be able to be leveraged by the electric business”, please explain how the Gas Business Enablement work will be leveraged by the electric business including any projected cost savings related to the electric business. Please provide all analysis, presentations, documents used by the company to evaluate the opportunity to leverage Gas Business Enablement work in the electric business.

Response:

Work processes involved in the Customer Contact Center and Electric Customer Meter Service will experience change as a result of the implementation of the solutions set for Gas Business Enablement. Therefore, electric customers will see a level of corollary benefits as Gas Business Enablement is rolled out for the gas distribution business.

That said, Electric Operations is not in the scope of Gas Business Enablement, although the opportunity to extend the Gas Business Enablement solution to electric operations was anticipated from the outset of the project. As referenced in the Company's response to Division 12-1, one of the three core objectives of Gas Business Enablement is to establish a standardized, unified platform across operating jurisdictions so that there is better flexibility to address future business needs. In the future, once experience is gained with the system and its capabilities, it may make sense to extend functionality to Electric Operations. However, this outcome is not the focus of the current implementation for Gas Business Enablement.

Based on past experience, National Grid recognizes that it is critically important to manage program scope carefully and to execute on a well-defined project scope and work plan. Therefore, Electric Operations was left out of the initial scope deliberately. This limitation will allow for thorough, directed focus on the implementation of a program for the gas distribution business where there is substantial benefit that can be achieved for gas customers in Rhode Island, New York, and Massachusetts.

To date, National Grid has not performed any formal analysis to evaluate the opportunity to extend the functionality of the Gas Business Enablement Program to the electric business. However, in key decisions such as software selection, National Grid has been cognizant that it could make sense in the future to extend functionality to Electric Operations. Therefore, National Grid has avoided selecting solutions that are exclusive to the gas distribution business and/or would obviate functionality for the electric business.

Division 12-6

Request:

Will the Company be able to leverage any of the Gas Business Enablement work in any of its unregulated business activities? If so, please explain how. If not, please explain why not.

Response:

Gas Business Enablement was specifically designed to address the challenges and opportunities facing National Grid's regulated U.S. gas distribution business.

There has been no involvement from any of National Grid's unregulated businesses in the strategic assessment, design, and development activities around Gas Business Enablement. To date, no opportunities to use or extend Gas Business Enablement to unregulated activities have been identified. Moreover, there are no plans to use or extend Gas Business Enablement to any unregulated business activities.

Division 12-7

Request:

In its procurement of services and systems related to the Gas Enablement Program, did or does the company expect to negotiate any special pricing or contract terms related to extending deployment of the service or system to (a) its U.S. regulated electric business, (b) potential future growth of National Grid in other U.S. jurisdictions (c) the Company's unregulated businesses, (d) any other National Grid, PLC companies? If so, please explain the details of such special pricing or contract terms.

Response:

During its procurement of the services and systems comprising the Gas Business Enablement Program, National Grid did not envision, determine, or identify that the contractual terms or pricing for the services or system deployment would warrant extension into: (a) the U.S. regulated electric business; (b) potential future growth of National Grid in other U.S. jurisdictions; (c) National Grid's unregulated businesses; or (d) any other National Grid plc companies. Therefore, at this time there are no special pricing or contract terms with respect to (a), (b), (c) and (d).

As indicated in the Company's response to Division 12-5, the opportunity to extend the Gas Business Enablement solution to Electric Operations was anticipated from the outset of the project and arises from the third core objective of Gas Business Enablement, which is to establish a standardized, unified platform across operating jurisdictions so that there is better flexibility to address future business needs. In the future, once experience is gained with the system and its capabilities, it may make sense to extend functionality to Electric Operations. However, this outcome is not the focus of the current implementation for Gas Business Enablement and no "special pricing or contract terms" exist in relation to this future, potential course of action.

Division 12-8

Request:

Referring to the response to Attachment DIV 3-53-5, page 4 of 51, please provide an explanation of the \$40+M Gas safety & compliance penalties received over the previous 3 years, including the jurisdiction that incurred the penalty. Is this amount over and above the \$40M of benefit referred to in DIV 12-3, above?

Response:

The jurisdictional breakdown of the estimated \$40+ million in avoided gas safety and compliance penalties is shown below by jurisdiction in Column A. For the computation of the \$40+ million avoided cost benefit, National Grid computed the three-year average of actual compliance penalties, shown in Column (B). Attachment DIV 12-8 provides a detailed listing of the gas safety and compliance penalties by jurisdiction and year.

Operating Company ²	Total (A)	Three-Year Average (B)
Boston Gas Company	\$ 1,635,203	\$ 545,068
Colonial Gas Company	\$ 365,797	\$ 121,932
The Brooklyn Union Gas Company (KEDNY)	\$ 14,300,000	\$ 4,766,667
KeySpan Gas East Corporation (KEDLI)	\$ -	\$ -
Niagara Mohawk Power Corporation	\$ 23,700,000	\$ 7,900,000
The Narragansett Electric Company	\$ 561,400	\$ 187,133
Total	\$ 40,562,400	\$ 13,520,800

Reduced Compliance and Gas Safety Penalties

	The Brooklyn Union Gas Company (KEDNY) ¹				
	2013	2014	2015	3 Year Average	Total at Risk (2016)
Records Violations- High Risk	X	X	X		
Records Violations- Other	X	X	X		
HEFPA					
Warning Tags					
Internal Corrosion					
20 Year Regulator Inspections					
Inactive Services					
Public Building Inspection					
Leak Classification or Mitigation	X	X	X		
Leak Repair or Surveillance	X	X	X		
Warning Tag Classification			X		
MA Gas Compliance Work Plan					
Corrosion- Annual Inspection	X	X	X		
Service Atmospheric Inspection	X		X		
Pressure Charts - Company Name		X			
Total Compliance	\$ 2,700,000	\$ 5,400,000	\$ 6,200,000	\$ 4,766,667	\$ 18,000,000

Operating Company ²	Total	3 Year Average	Benefits ³
Boston Gas Company	\$ 1,635,203	\$ 545,068	\$ 545,068
Colonial Gas Company	\$ 365,797	\$ 121,932	\$ 121,932
The Brooklyn Union Gas Company (KEDNY)	\$ 14,300,000	\$ 4,766,667	\$ 4,766,667
KeySpan Gas East Corporation (KEDLI)	\$ -	TBD	TBD
Niagara Mohawk Power Corporation (NMPC)	\$ 23,700,000	\$ 7,900,000	\$ 7,900,000
The Narragansett Electric Company	\$ 561,400	\$ 187,133	\$ 187,133
Total	\$ 40,562,400	\$ 13,520,800	\$ 13,520,800

General Allocators	All	MA
Boston Gas Company	23.29%	82%
Colonial Gas Company	5.21%	18%
The Brooklyn Union Gas Company (KEDNY)	30.10%	
Keyspan Gas East Corporation (KEDLI)	21.55%	
Niagara Mohawk Power Corporation - Gas	12.44%	
Narragansett Gas	7.41%	
Total	100.00%	29%

Assumptions / Sources / Notes

1 KEDNY, KEDLI, and NMPC gas safety and compliance metrics source: Patric O'Brien, Director Asst. General Counsel; MA metrics: Amy Smith, Director Pipeline Safety; RI metrics: Deb Byron, Lead Program Manager Pipeline Safety

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

3 100% reduction in penalties agreed by Johnny Johnston

	KeySpan Gas East Corporation (KEDLI) ¹				
	2013	2014	2015	3 Year Average	Total at Risk (2016)
Records Violations- High Risk					
Records Violations- Other					
HEFPA					
Warning Tags					
Internal Corrosion					
20 Year Regulator Inspections					
Inactive Services					
Public Building Inspection					
Leak Classification or Mitigation					
Leak Repair or Surveillance					
Warning Tag Classification					
MA Gas Compliance Work Plan					
Corrosion- Annual Inspection					
Service Atmospheric Inspection					
Pressure Charts - Company Name					
Total Compliance	TBD	TBD	TBD	TBD	TBD

	Niagara Mohawk Power Corporation (NMPC) ¹				
	2013	2014	2015	3 Year Average	Total at Risk (2016)
Records Violations- High Risk	X	X	X		
Records Violations- Other					
HEFPA	X		X		
Warning Tags	X	X	X		
Internal Corrosion		X			
20 Year Regulator Inspections		X			
Inactive Services			X		
Public Building Inspection			X		
Leak Classification or Mitigation	X	X	X		
Leak Repair or Surveillance	X	X	X		
Warning Tag Classification	X	X	X		
MA Gas Compliance Work Plan					
Corrosion- Annual Inspection					
Service Atmospheric Inspection					
Pressure Charts - Company Name					
Total Compliance	\$ 9,000,000	\$ 9,000,000	\$ 5,700,000	\$ 7,900,000	\$ 9,000,000

	MA ¹				
	2013	2014	2015	3 Year Average	Total at Risk
Records Violations- High Risk					
Records Violations- Other					
HEFPA					
Warning Tags					
Internal Corrosion					
20 Year Regulator Inspections					
Inactive Services					
Public Building Inspection					
Leak Classification or Mitigation					
Leak Repair or Surveillance					
Warning Tag Classification					
MA Gas Compliance Work Plan					
Corrosion- Annual Inspection					
Service Atmospheric Inpsection					
Pressure Charts - Company Name					
Total Compliance	\$ 486,000	\$ 160,000	\$ 1,355,000	\$ 667,000	

	Rhode Island ¹				
	2013	2014	2015	3 Year Average	Total at Risk
Records Violations- High Risk					
Records Violations- Other					
HEFPA					
Warning Tags					
Internal Corrosion					
20 Year Regulator Inspections					
Inactive Services					
Public Building Inspection					
Leak Classification or Mitigation					
Leak Repair or Surveillance					
Warning Tag Classification					
MA Gas Compliance Work Plan					
Corrosion- Annual Inspection					
Service Atmospheric Inpsection					
Pressure Charts - Company Name					
Total Compliance	\$ 267,400	\$ 75,000	\$ 219,000	\$ 187,133	

Division 12-9

Request:

Referring to the response to Attachment DIV 3-53-5, page 5 of 51, for each option where there is a reference to Enhanced Capabilities, please confirm whether the Enhanced Capabilities dollars in the Investment column is included in or in addition to the Total investment dollars listed in the Investment column.

Response:

Referring to Attachment DIV 3-53-5, Page 5 of 51, there are two options that include enhanced capabilities. For both options, the enhanced capabilities investment is included in the total cost.

Option 4: Value Oriented – Jurisdiction Deployment

Enhanced capabilities \$185 million is included in the total investment \$458 million

Option 5: Value Oriented – Accelerated Deployment

Enhanced capabilities \$193 million is included in the total investment \$466 million

Further evidence of this can be found in the same Attachment DIV 3-53-5, Page 27 of 51 and Page 29 of 51.

Division 12-10

Request:

Referring to the response to Attachment DIV 3-53-5, page 30 of 51, please explain the note "Labor cost is inclusive of the cost internal National Grid labor and external consulting / systems integrator labor needed to deliver the program; an exercise is ongoing to determine how much of the internal National Grid Labor has been included in the rate base and how much is incremental." Please also provide any analysis the Company has performed associated with such exercise, with formulas intact.

Response:

The note in Attachment DIV 3-53-5, page 30 of 51 references incremental internal National Grid labor. Gas Business Enablement operating expense includes internal labor and benefits costs. The Gas Business Enablement project team includes 54 National Grid internal resources who were employed as of June 30, 2017 (*i.e.*, the end of the test year). Because those 54 employees would be included in the test-year ending employee complement used to calculate rate year labor and benefits costs in this case, the Company reduced its share of total Gas Business Enablement operating expense by the amount of labor and benefits costs associated with those 54 employees. Therefore, the amount of total Gas Business Enablement operating expense upon which the Company's rate year request was calculated reflects a level of internal labor and benefit costs incremental to the amount of rate year labor and benefit costs requested elsewhere in this docket.

Attachment DIV 12-10-1 on Page 1 shows the calculation of total "base-line" Gas Business Enablement internal labor and benefits by fiscal year. Base-line labor and benefits were based on the annualized salaries of the 54 employees noted above, assumed labor benefits overhead rates, and assumed percentages of time charged to capital work versus non-capital work. The number of employees was based on the Gas Business Enablement Roadmap, which the Company provided in its November 27, 2017 initial filing with the joint pre-filed direct testimony of Company Witnesses Anthony H. Johnston and Christopher J. Connolly as Schedule GBE-4. Page 2 of Attachment DIV 12-10-1 shows the reduction of total Gas Business Enablement operating expense by the amount of base-line labor and benefits to arrive at total incremental Gas Business Enablement operating expense by fiscal year. Narragansett Gas was allocated 7.37 percent of these costs to arrive at its share of total incremental Gas Business Enablement operating expense of \$10.1 million as shown on Schedule MAL-36, Page 6 on Line 3, Column (r) (Bates Page 51 of Book 10). For an explanation of how the Gas Business Enablement costs are being allocated to the various jurisdictions, please refer to the Company's response to PUC 5-13, a copy of which is provided as Attachment DIV 12-10-2 for ease of reference.

In preparing this response, the Company discovered that it inadvertently reduced total Fiscal Year 2018 Gas Business Enablement operating expense by total burdened labor costs rather than

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

the portion of total burdened labor charged to non-capital work. The result is an increase to the revenue requirement of \$23,255. The Company will reflect this adjustment in a subsequent update to its revenue requirement for Narragansett Gas.

Gas Business Enablement

National Grid Internal Resources - RI Rate Case (Labor and Burdens by Fiscal Year)

Summary		(a)		(b)		(c)		(d)		(e)		(f)
		FY18		FY19		FY20		FY21		FY22		FY23
(1) Burdened Labor (CapEx)	\$	9,108,787	\$	7,208,341	\$	7,699,482	\$	5,698,379	\$	1,922,449	\$	-
(2) Burdened Labor (OpEx)	\$	4,486,418	\$	4,457,097	\$	3,956,163	\$	3,473,209	\$	1,171,338	\$	56,438
(3) Burdened Labor (Total)	\$	13,595,205	\$	11,665,437	\$	11,655,645	\$	9,171,588	\$	3,093,787	\$	56,438
(4)												
(5) <i>Burdens % (QC/QA)</i>		78%		78%		78%		78%		78%		0%
(6) <i>Annual Merit</i>				2.5%		2.5%		2.5%		2.5%		2.5%
(7) <i>% CapEx of Total Labor</i>		67.0%		61.8%		66.1%		62.1%		62.1%		0.0%
(8) <i>% OpEx of Total Labor</i>		33.0%		38.2%		33.9%		37.9%		37.9%		100.0%
(9) <i>Max. FTEs</i>		54.00		54.00		52.00		43.00		29.00		1.00
(10) <i>Avg. FTEs</i>				54.00		51.00		38.00		13.00		0.30
(11)												
(12) Detailed Breakout												
(13)		FY18		FY19		FY20		FY21		FY22		FY23
(14) Burdens (CapEx)	\$	3,991,491	\$	3,158,711	\$	3,373,930	\$	2,497,042	\$	842,421	\$	-
(15) Burdens (OpEx)	\$	1,965,958	\$	1,953,110	\$	1,733,600	\$	1,521,968	\$	513,283	\$	24,731
(16) Labor (CapEx)	\$	5,117,296	\$	4,049,630	\$	4,325,552	\$	3,201,336	\$	1,080,027	\$	-
(17) Labor (OpEx)	\$	2,520,459	\$	2,503,987	\$	2,222,564	\$	1,951,241	\$	658,055	\$	31,707
(18) Burdened Labor (Total)	\$	13,595,205	\$	11,665,437	\$	11,655,645	\$	9,171,588	\$	3,093,787	\$	56,438

NOTE: Labor includes annual merit increase. Merit increase occurs July of each fiscal year.

NOTE: "Avg FTEs" based on a 12-month fiscal year.

(1) Line 14 + Line 16	(16)	Total Labor * Line 7
(2) Line 15 + Line 17	(17)	Total Labor * Line 8
(14) Line 16 * Line 5	(18)	Sum of Lines 14 through 17
(15) Line 17 * Line 5		

**Gas Business Enablement
Incremental project operating expense
Allocated to Narragansett Gas**

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Corrected	FY17 Actual	FY18 forecast	FY19 forecast	FY20 forecast	FY21 forecast	FY22 forecast	FY23 forecast	TOTAL
(1) Total project opex	\$ 19,824,143	\$ 25,070,423	\$ 57,969,491	\$ 34,924,573	\$ 18,783,786	\$ 4,876,829	\$ 1,097,004	\$ 162,546,249
(2) less Steady State labor & benefits	\$ (4,079,528)	\$ (4,486,418)	\$ (4,457,097)	\$ (3,956,163)	\$ (3,473,209)	\$ (1,171,338)	\$ (56,438)	\$ (21,680,191)
(3) Incremental project opex	\$ 15,744,615	\$ 20,584,006	\$ 53,512,394	\$ 30,968,410	\$ 15,310,576	\$ 3,705,490	\$ 1,040,566	\$ 140,866,058
(4)								
(5) Percentage allocated to Narragansett Gas		7.37%	7.37%	7.37%	7.37%	7.37%	7.37%	
(6) Dollars allocated to Narragansett Gas	\$ 1,176,955	\$ 1,517,041	\$ 3,943,863	\$ 2,282,372	\$ 1,128,389	\$ 273,095	\$ 76,690	\$ 10,398,406
(7)								
(8) Amortization period (years)								10
(9) Annual Incremental Opex 10-yr amortization								\$ 1,039,841
(10)								
(11) As filed	FY17 Actual	FY18 forecast	FY19 forecast	FY20 forecast	FY21 forecast	FY22 forecast	FY23 forecast	TOTAL
(12) Total project opex	\$ 19,824,143	\$ 25,070,423	\$ 57,969,491	\$ 34,924,573	\$ 18,783,786	\$ 4,876,829	\$ 1,097,004	\$ 162,546,249
(13) less Steady State labor & benefits	\$ (4,079,528)	\$ (7,637,756)	\$ (4,457,097)	\$ (3,956,163)	\$ (3,473,209)	\$ (1,171,338)	\$ (56,438)	\$ (24,831,529)
(14) Incremental project opex	\$ 15,744,615	\$ 17,432,668	\$ 53,512,394	\$ 30,968,410	\$ 15,310,576	\$ 3,705,490	\$ 1,040,566	\$ 137,714,720
(15)								
(16) Percentage allocated to Narragansett Gas		7.37%	7.37%	7.37%	7.37%	7.37%	7.37%	
(17) Dollars allocated to Narragansett Gas	\$ 1,176,955	\$ 1,284,788	\$ 3,943,863	\$ 2,282,372	\$ 1,128,389	\$ 273,095	\$ 76,690	\$ 10,166,152
(18)								
(19) Amortization period (years)								10
(20) Annual Incremental Opex 10-yr amortization								\$ 1,016,615
(21) Increase to revenue requirement								\$ 23,225

- (2) Page 2 , Line 2
- (6) Line 3 * Line 5
- (9) Line 6 ÷ Line 8
- (13) Line 2 ; Column (b) equals Page 1 Column (a) Lines 16 + Line 17
- (17) Line 14 * Line 16; Column (h) agrees to Schedule MAL-36 , Page 6, at Line 3, Column (r)
- (20) Line 17 ÷ Line 19; agrees to Schedule MAL-36 , Page 6, at Line 14
- (21) Line 9 - Line 20

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Responses to Commission's Fifth Set of Data Requests
Issued January 5, 2018

PUC 5-13

Request:

Referencing Johnston and Connolly direct testimony at page 121, lines 14-18, please explain how the expected cost allocation among the jurisdictions was developed for Gas Business Enablement. Please explain why this allocation methodology is appropriate to Gas Business Enablement.

Response:

The allocator selected for Gas Business Enablement is based on the number of gas retail customers in each jurisdiction, which is shown in the table below.

Description	SAP Alloc. Code	SAP Co./Seg	Jurisdiction	Company Description	Number of Customers	%
All Gas Retails	C-210	5210G	NY	Niagara Mohaw k Pow er Corporation (Gas)	639,493	16.93%
	C-210	5220G	NY	The Brooklyn Union Gas Company (KEDNY)	1,315,562	34.83%
	C-210	5230G	NY	KeySpan Gas East Corporation (KEDLI)	609,071	16.13%
	C-210	5330G	MA	Boston Gas Company	723,122	19.15%
	C-210	5340G	MA	Colonial Gas Company	211,077	5.59%
	C-210	5360G	RI	The Narragansett Electric Company (Gas)	278,403	7.37%
				Totals	3,776,728	100.00%

The customer allocator is the most appropriate for the Gas Business Enablement Program because the benefits of the program are customer focused. The Gas Business Enablement Program will enable simple and effective interactions between National Grid and its customers based on the customers' individual communications preferences by improving the self-service customer experience.

Customers will be able to: (1) schedule appointments with National Grid on their own terms for home or business, (2) change appointments as required to better fit their schedules, (3) receive reminders from National Grid about appointments and other activities, (4) submit photos to National Grid to describe an issue or problem, (5) follow up on the progress and status of work requests and appointments, and (6) view the website and understand if National Grid's crew(s) are in the vicinity.

Additionally, large commercial customers and multi-unit property owners will be able to: (1) bundle appointments to help manage time more effectively, (2) view the status and progress of their requests and appointments, (3) delegate communication and interaction preferences (e.g., delegate point of contact for each property), (4) receive notifications and alerts about an issue at assigned premises assigned, and receive for more efficient and flexible scheduling and service.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Responses to Commission's Fifth Set of Data Requests
Issued January 5, 2018

Further, National Grid Customer Contact Center employees will have a 360-degree view of customer contacts, interactions, and account history in one place in the Customer Relationship Management (i.e. Salesforce) solution. This allows National Grid Customer Contact Center employees enhanced capabilities to manage customer interactions including the ability to:

- Find information about how to establish gas service, as well as the cost for the service (i.e. CIAC);
- Perform account inquiries, including billing issues, service suspensions, etc.;
- Create and adjust payment arrangements;
- Escalate compliments and/or complaints; and
- View outage statuses and the customers impacted.

With the new solution delivering the capabilities described above, National Grid is able to report customer metrics more efficiently, create dashboards to monitor activities, and perform analytics to more effectively drive business performance.

Division 12-11

Request:

Referring to Workpaper 6a-6c Service Company Rents, tab IS Existing Projects RY1 with a INVP# equal to USFP, for those projects not identified in the response to DIV 9-2, please provide detailed documentation for each project, including project authorization forms or work orders.

Response:

Please see Attachment DIV 12-11 for the requested project documentation. Please also see the table below for details regarding the projects and cross-references to Attachment DIV 12-11. The majority of the projects were part of the Information Services (IS) investment sanction process. Therefore, the project documentation is a sanction paper, which was presented to the U.S. Sanction Committee for approval.

The two exceptions are the Finance Remediation calendar year (CY) 2016 Capital and the EHR1 – IT Delivery projects, which were managed by the Business Improvement Steering Group that was established to provide oversight on all post-U.S. Foundation Program (USFP) enhancements. This team utilized separate processes to track its project costs and deliverables. The Finance Remediation CY 2016 Capital work order was created to capture costs related to the migration of additional Finance capabilities onto the SAP HANA (high-performance analytic appliance) platform. To support the costs, National Grid included the work order summary and two supporting project templates, Record to Report (RTR) -23 and RTR-24, which detail the project scope and costs of \$0.281 million and \$1.554 million, respectively. The EHR1 – IT Delivery work order was part of the EHR1 Program and was setup to capture vendor consulting and license costs related to several projects within the EHR1 Program. Please see the Company's response to Division 9-2 for an overview of the EHR1 program. This attachment is not included with this response because it is greater than 10 pages in length. In support of the costs, National Grid included the work order summary and supporting invoices of \$1.8 million from SAP America for the consulting costs. The license costs are for SAP licenses that were purchased in the UK under the National Grid Enterprise Licensing Agreement with SAP. The costs are cross-charged to the US in the form of a transactional accounting entry.

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Responses to Division's Twelfth Set of Data Requests
Issued January 18, 2018

Line	Investment Name	Description	INVP #	Work Order	HTY Total Spend	Documentation
15	INVP 4218 - Blanket Work Order	INVP 4218 - Blanket Work Order	USFP	90000178859	\$ 3,889,611	Attachment DIV 12-11 pg. 1 - 14
16	INVP 3922 - Access Violation Mgmt	INVP 3922 - Access Violation Management	USFP	90000176039	\$ 3,263,689	Attachment DIV 12-11 1 pg. 15 - 28
77	Finance Remediation FY16 Capital	Capitalized Software- Finance Remediation FY16	USFP	90000172054	\$ 1,858,401	Attachment DIV 12-11 pg. 29 - 52
114	EHR1 - IT Delivery	EHR1 - IT Delivery	USFP	90000148061	\$ 2,568,884	Attachment DIV 12-11 pg. 53 - 85
117	INVP 3915 - Annual HR & Payroll SP	INVP 3915 - Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	USFP	90000178452	\$1,099,202	Attachment DIV 12-11 pg. 86 - 91
155	INVP 4225 - Ancillary SAP Apps	INVP 4225 - Ancillary SAP Application Updates	USFP	90000176046	\$1,252,371	Attachment DIV 12-11 pg. 92 - 106
156	INVP 4224 - HANA	INVP 4224 - High Performance Analytics Appliance (HANA)	USFP	90000176043	\$1,112,922	Attachment DIV 12-11 pg. 107 - 119
157	INVP 4223 - US SAP BOE Update	INVP 4223 - US SAP Annual Business Objects Environment (BOE) Update	USFP	90000176041	\$1,221,231	Attachment DIV 12-11 pg. 120 - 129
253	INVP 4219 - PowerPlan Upgrade	INVP 4219 - PowerPlan Upgrade	USFP	90000176040	\$ 2,092,271	Attachment DIV 12-11 pg. 130 - 142



US Sanction Paper

Title:	Blanket Work Order	Sanction Paper #:	USSC-16-202 v2
Project #:	INVP 4218	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	October 12, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Sharon Partridge, VP US Corporate Finance
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4218 in the amount \$6.891M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$6.891M broken down into:

\$6.177M	Capex
\$0.714M	Opex
\$0.000M	Removal

1.2 Project Summary

The goals of this project are to improve performance by utilizing a common industry practice of single work orders, consolidate process accounting, implement blanket work orders, and optimize work order lifecycle processes. These enhancements will reduce administrative burden in the work order lifecycle while also enabling work orders to be capitalized in a timely manner.



US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4218	Blanket Work Order	6.891
Total		6.891

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	1.574
3922	Access Violation (& Regulation) Management	4.300
4219	PowerPlan Upgrade	3.551
4223	BOE Update	1.543
4224	HANA Update	1.335
4225	Ancillary SAP App Update	2.047
4226	ARIBA Releases Support	0.230
Total		14.580

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Tolerance
JUL 2016	USSC	\$0.510M	\$6.791M	Blanket Work Order	Partial Sanction	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
MAR 2017	Project Closure

1.7 Category

Category	Reference to Mandate, Policy, or NPV Assumptions
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV	The project aim is to improve the timeliness of work order closeout and streamline the work order lifecycle process by using blankets work orders in specific cases.



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 17

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 17

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan, FY-2016/17	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$6.891M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the IS Relationship Manager with the Planning Analyst assistance to meet jurisdictional budgetary, statutory and regulatory requirements.



US Sanction Paper

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx	0.000	6.177	0.000	0.000	0.000	0.000	0.000	6.177
OpEx	0.000	0.714	0.000	0.000	0.000	0.000	0.000	0.714
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	6.891	0.000	0.000	0.000	0.000	0.000	6.891

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	APR 2016
Begin Requirements and Design	MAY 2016
Begin Development and Implementation	MAY 2016
Sanction Requirements and Design	JUN 2016
Sanction Development and Implementation Sanction	OCT 2016
Move to Production	DEC 2016
Sanction Project Complete	DEC 2016
Sanction Project Closure	MAR 2017

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green



US Sanction Paper

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

1	INVP 4218 BWO TCO 12-Oct-2016 D I v2.xls
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US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on October 12, 2016:

- (a) APPROVED this paper and the investment of \$6.891M and a tolerance of +/- 10%.
- (b) NOTED that Samir Parikh has the approved financial delegation.

Signature..........Date..........
Christopher Kelly
Acting Senior Vice President US Sanctioning Committee Co - Chair Person



US Sanction Paper

3 Sanction Paper Detail

Title:	Blanket Work Order	Sanction Paper #:	USSC-16-202 v2
Project #:	INVP 4218	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	October 12, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Sharon Partridge, VP US Corporate Finance
Utility Service:	IS	Project Manager:	Samir Parikh

3.1 **Background**

An audit finding noted a lack of rigor and timeliness in the closeout of work orders from construction work in progress (CWIP) to construction complete not classified (CCNC) and plant in-service. In addition, since SAP go-live, the volume of work orders created on an annual basis has caused issues and challenges not limited to time entry, inefficient close-out and intensive manual effort to investigate and remediate errors.

Currently, blanket work orders are used for transformer and meter purchases, meter installs and tool and general equipment purchases. The Blanket Work Order process will be expanded to address routine, high-volume, and low dollar value jobs.

Blanket work orders will be utilized in an effort to:

- Provide the ability to capitalize Work Orders in timely manner to optimize cost recovery and improve the ability to achieve Capital Tracker / TIRF targets
- Limit exposure to inactive CWIP and expense write-offs
- Reduce manual effort for analyzing and investigating work order issues. Allow focus on areas of high priority issues
- Improve system performance due to lower volume of Work Orders and elimination of data
- Align with Industry leading practices

3.2 **Drivers**

The project is driven by National Grid's need to reduce administrative burden, comply with regulatory requirements, close inactive work orders, and save funds.

US Sanction Paper

3.3 Project Description

A combination of two design approaches, namely the "Many to One" and "Parent Child" principles will be implemented with the Blanket Work Order project. Each of the two approaches are being designed to optimize the benefit of the blanket work order solution. The below table provides an overview of the complete solution.

The blanket work order solution will apply only to routine, high-volume, low dollar value jobs. Threshold – of \$0.100M per job except Massachusetts at \$0.050M per job (to be confirmed with regulatory)

<p>Many-to-One Scenario</p> <ul style="list-style-type: none"> Jobs that do not require tracking of estimates or actual charges at an individual job level Jobs that do not require material estimates or material as builds <p>Solution</p> <ul style="list-style-type: none"> Many individual jobs in WMS map to as single Blanket work order in PowerPlan and SAP (many to one mapping) Individual work orders do not exist for each job Charges are applied to Blanket work orders Charges are not available at an individual job level <p>Example</p> <ul style="list-style-type: none"> Lighting expense work (bulb replacements) Expect to aggregate approximately 50,000 jobs 	<p>Parent Child Scenario</p> <ul style="list-style-type: none"> Jobs that require tracking of estimates and actual charges at an individual job level Jobs that require material estimate or material as builds to be processed <p>Solution</p> <ul style="list-style-type: none"> Individual work order exist for each WMS job Estimates and charges are applied to the individual / child work orders (granularity is maintained as in current solution) No impact to unit cost reporting Charges are closed to FERC 106 account (CCNC) and 101 account at the parent level <p>Example</p> <ul style="list-style-type: none"> New electric and gas service installations Private Area Lighting (PAL) installation Approximately 100,000 jobs to become children of a blanket work order
--	---

During the Requirements and Design (R&D) phase of the project, the following will need to be accomplished:

- Baseline the detailed business and technical requirements
- Stakeholder engagement, including Operations and Regulatory meetings
- Design the testing strategy
- Define the training strategy

During the Development and Implementation (D&I) phase of the project, the following will need to be accomplished:

- System Testing
- Integration Testing
- Regression Testing
- User Acceptance Testing
- Implementation



US Sanction Paper

3.4 Benefits Summary

The main benefits of the project are:

- Complete a detailed design for Electric and Gas "Simple" jobs.
- Provide a new business process to process the high volume, low volume and value (dollar value) jobs using blanket work orders.
- Reduce manual effort for analyzing and investigating work order issues. Allow focus on areas of high priority issues.
- Provide the ability to capitalize Work Orders in timely manner to optimize cost recovery and improve the ability to achieve Capital Tracker / targeted infrastructure replacement (TIRF) targets.
- Limit exposure to inactive CWIP and expense write-offs.
- Improve system performance due to lower volume of Work Orders and elimination of certain data like initial estimate.

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Defer Project / Do Nothing

This is not a viable option due to the criticality of the solution for the company.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	Limited business resource availability may hamper completion of project deliverables	3	2	3	6	9	Mitigate	Prioritize the business resources workload and obtain support from business project sponsors/ leadership	The completion and quality of the Testing and Build phases may be compromised due to limited business and system owner availability.	Work with Mike Temba
2	Impacts from other inflight projects must be monitored	3	2	3	6	9	Avoid	Prioritize the business resources workload and obtain support from business project sponsors/leadership	The completion and quality of the Testing and Build phases may be compromised due to competing priorities of other IT Projects which would ultimately limit business and system owner availability.	Continue to track business resources availability



US Sanction Paper

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
INVP 4218	Blanket Work Order	+/- 10%	CapEx	0.000	6.177	0.000	0.000	0.000	0.000	0.000	6.177
			OpEx	0.000	0.714	0.000	0.000	0.000	0.000	0.714	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	6.891	0.000	0.000	0.000	0.000	6.891	
Total Project Sanction			CapEx	0.000	6.177	0.000	0.000	0.000	0.000	0.000	6.177
			OpEx	0.000	0.714	0.000	0.000	0.000	0.000	0.714	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	6.891	0.000	0.000	0.000	0.000	6.891	



US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

		Prior Yrs (Actual)	Current Planning Horizon						Total
	\$M		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Variance (Business Plan-Project Estimate)

		Prior Yrs (Actual)	Current Planning Horizon						Total
	\$M		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx		0.000	(6.177)	0.000	0.000	0.000	0.000	0.000	(6.177)
OpEx		0.000	(0.714)	0.000	0.000	0.000	0.000	0.000	(0.714)
Removal		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan		0.000	(6.891)	0.000	0.000	0.000	0.000	0.000	(6.891)

3.11.3 Cost Assumptions

This estimate was developed in 2016 using the standard IS estimating methodology. The accuracy level of estimate for each project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.5 Additional Impacts

None



US Sanction Paper

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual's Name
Business Executive Sponsor	Sharon Partridge
Business Client Lead	William Donoghue
Head of BRM/Strategy	Jon Poor
Head of PDM	Jeffrey Dailey
Relationship Manager	Joel Semel
Program Delivery Manager	Samir Parikh
IS Finance Management	Chip Benson
IS Regulatory	Daniel DeMauro
DR&S	Mukund Ravipaty
Service Transition	Brian Detota
Enterprise Architecture	Henrik Magnusson

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual	Area
Finance	Benson, Chip	All
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Patterson, James	Electric - NE
	Harbaugh, Mark	Electric - NY
	Hill, Terron	FERC
	Iseler, David G.	Gas – NE
	Brown, Laurie	Gas – NY
Procurement	Curran, Art	All



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Other Appendices

4.2.1 Project Cost Breakdown:

Project Cost Breakdown			
Cost Category	sub-category	\$ (millions)	Name of Firm(s) providing
Personnel	NG Resources	0.149	
	SDC Time & Materials	-	
	SDC Fixed-Price	-	
	All other personnel	4.755	Wipro, Deloitte, PowerPlan
	TOTAL Personnel Costs	4.904	
Hardware	Purchase	-	
	Lease	0.416	T-Systems
Software		-	
Risk Margin		1.297	
Other		0.274	
TOTAL Costs		6.891	



US Sanction Paper

4.2.2 Benefiting Operating Companies:

Benefiting Operating Companies Table:

The requested budget will be allocated to all companies.

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent Company	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA,NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc. Service Company	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp. Service Company	Service Company	
New England Electric Trans Corp	Inter Connector	MA



US Sanction Paper

Title:	Access Violation (& Regulation) Management	Sanction Paper #:	USSC-16-201 v2
Project #:	INVP 3922	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	August 10, 2016
Author / NG Representative:	Diane Beard / Joseph Howard	Sponsor:	Dave Campbell, VP Corporate Finance, Fin Plan & Analysis
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 3922 in the amount \$4.300M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$4.300M broken down into:

\$2.128M	Capex
\$2.172M	Opex
\$0.000M	Removal

1.2 Project Summary

This policy-driven project will implement the Systems, Applications, and Product (SAP) Access Violation Management (AVM) application by Greenlight Technologies. The AVM product provides the capability to enhance our monitoring of user access violation across systems where gaps in the enhanced security and controls capabilities exist today at National Grid. Additionally, this solution provides a cross application platform for the automation of segregation of duty (SOD) control framework violations. The AVM tool provides a complete platform for real time monitoring of our user access controls and centralizes the functionality for tracking resolution of those exceptions. The implementation of this tool helps strengthen the overall content and structure tool Sarbanes-Oxley (SOX), and controls the framework, which has been the focus of recent audit findings by our external audit partner and National Grid Audit Committee.



US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 3922	Access Violation (& Regulation) Management	4.300
Total		4.300

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	1.574
4218	Blanket Work Order	6.891
4219	PowerPlan Upgrade	3.551
4223	BOE Update	1.543
4224	HANA Update	1.335
4225	Ancillary SAP App Update	2.047
4226	ARIBA Releases Support	0.230
Total		17.171

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Tolerance
JUN 2016	USSC	\$3.198M	\$4.707m	INVP 3922 Access Violation (& Regulation) Management	Partial Sanction	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
MAR 2017	Project Closure

1.7 Category

Category	Reference to Mandate, Policy, or NPV Assumptions
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV	This project is being funded to enhance the overall control environment, reduce risk, and to help mitigate control deficiencies.



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 41

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 17

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan, FY-2016/17	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$3.893M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the IS Relationship Manager with the Planning Analyst assistance to meet jurisdictional budgetary, statutory and regulatory requirements.



US Sanction Paper

1.13 Current Planning Horizon

		Current Planning Horizon						
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
\$M	Prior Yrs	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	
CapEx	0.000	2.128	0.000	0.000	0.000	0.000	0.000	2.128
OpEx	0.000	2.172	0.000	0.000	0.000	0.000	0.000	2.172
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	4.300	0.000	0.000	0.000	0.000	0.000	4.300

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	APR 2016
Begin Requirements and Design	MAY 2016
Partial Sanction	JUN 2016
Full Sanction	AUG 2016
Begin Development and Implementation	SEP 2016
Move to Production	DEC 2016
Project Complete	DEC 2016
Sanction Project Closure	MAR 2017

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A



US Sanction Paper

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

1	INVP 3922_TCO_10-Aug-2016_D I v2.xls
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US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on August 10, 2016:

- (a) APPROVED this paper and the investment of \$4.300 and a tolerance of +/-10%.
- (b) APPROVED the RTB impact of \$0.409M (per annum).
- (c) NOTED that Samir Parikh has the approved financial delegation.

Signature..........Date.....
Christopher Kelly
Acting Senior Vice President US Sanctioning Committee Co - Chair Person



US Sanction Paper

3 Sanction Paper Detail

Title:	Access Violation (& Regulation) Management	Sanction Paper #:	USSC-16-201 v2
Project #:	INVP 3922	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	August 10, 2016
Author / NG Representative:	Diane Beard / Joseph Howard	Sponsor:	Dave Campbell, VP Corporate Finance, Fin Plan & Analysis
Utility Service:	IS	Project Manager:	Samir Parikh

3.1 **Background**

On a regular basis, National Grid analyzes activities related to High Risk Segregation of Duties (SoD) conflicts and user access violations in order to meet compliance requirements.

The Greenlight AVM tool will provide a platform to automatically detect violations, thereby eliminating the need for these look back analysis activities, which will assist in improving the overall control environment.

3.2 **Drivers**

The project is driven by National Grid's desire to enhance its internal control environment and reduce the need for look back analysis activities in the future.

3.3 **Project Description**

Implement Greenlight's AVM tool in National Grid's environment and evaluate, design, build, test, and implement 19 AVM monitoring rule specifications for several High Risk SoD conflicts in the SAP Governance, Risk and Compliance (GRC) Access Control (AC) tool supporting the SAP Enterprise Central Component (ECC) production system.

US Sanction Paper

3.4 Benefits Summary

The requests worked under this project will contribute to the following:

Risk reduction:

- Active monitoring of controls, enabling a constant real-time review with reduced risk of human error.
- Shift discovery of any issues - avoiding "last minute" issues that require senior management time to resolve.

Others:

- Reduce manual control efforts and eliminate false positives.
- Extend the investment in & functionality of GRC.
- Alert business owners when exceptions occur: Identify issues before CET and external audit.
- Gain a clear understanding on cost of access violations.
- Enables executive level reporting by providing a dollar value for the access violations.
- Centrally track investigation and resolution of access violations.
- Give business users ownership of remediation activities.

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Reject the Project

This is not a viable solution because failure to address significant audit issues (including high risk SoD conflicts) can have negative consequences on National Grid's reputation and overall financial operations.

Alternative 2: Defer the Project

This is not a viable solution because failure to timely address significant audit issues (including high risk SoD conflicts) can have negative consequences on National Grid's reputation and overall financial operations. A strong internal control environment and positive results from audits is essential for positive decisions.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.



US Sanction Paper

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
1	Development (DEV) and/or testing (QA) environment may not be available at the required time due to commercial or operational constraints with our hosting provider.	4	4	4	10	10	Mitigate	SAP PDM and PM will work with hosting provider to prioritize delivery dates of most critical environments first. We will also escalate to IS Commercial as necessary any risks or issues we foresee. PCRs will also be submitted as far in advance as possible once environment timeline requirements are finalized.	The cost and timeline of the project may be impacted.	Project schedule and timeline would be re-evaluated based upon confirmed delivery dates from hosting provider.

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
INVP 3922	Access Violation (& Regulation) Management	+/- 10%	CapEx	0.000	2.128	0.000	0.000	0.000	0.000	0.000	2.128
			OpEx	0.000	2.172	0.000	0.000	0.000	0.000	0.000	2.172
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	4.300	0.000	0.000	0.000	0.000	0.000	4.300
Total Project Sanction			CapEx	0.000	2.128	0.000	0.000	0.000	0.000	0.000	2.128
			OpEx	0.000	2.172	0.000	0.000	0.000	0.000	0.000	2.172
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	4.300	0.000	0.000	0.000	0.000	0.000	4.300



US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

		Current Planning Horizon						
		Prior Yrs (Actual)	Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6+ 2021/22
\$M								Total
CapEx	0.000	0.294	0.000	0.000	0.000	0.000	0.000	0.294
OpEx	0.000	0.113	0.000	0.000	0.000	0.000	0.000	0.113
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.407	0.000	0.000	0.000	0.000	0.000	0.407

Variance (Business Plan-Project Estimate)

		Current Planning Horizon						
		Prior Yrs (Actual)	Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6+ 2021/22
\$M								Total
CapEx	0.000	(1.834)	0.000	0.000	0.000	0.000	0.000	(1.834)
OpEx	0.000	(2.059)	0.000	0.000	0.000	0.000	0.000	(2.059)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(3.893)	0.000	0.000	0.000	0.000	0.000	(3.893)

3.11.3 Cost Assumptions

This estimate was developed in 2016 using the standard IS estimating methodology. The accuracy level of estimate for each project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.5 Additional Impacts

None

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual's Name
Business Executive Sponsor	Dave Campbell
Head of BRM/Strategy	Jon Poor
Head of PDM	Jeffrey Dailey



US Sanction Paper

Relationship Manager	Joel Semel
Program Delivery Manager	Samir Parikh
IS Finance Management	Chip Benson
IS Regulatory	Daniel DeMauro
DR&S	Mukund Ravipaty
Service Delivery	Brian Detota
Enterprise Architecture	Henrik Magnusson

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual	Area
Finance	Benson, Chip	All
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Patterson, James	Electric - NE
	Harbaugh, Mark	Electric - NY
	Hill, Terron	FERC
	Iseler, David G.	Gas - NE
	Brown, Laurie	Gas - NY
Procurement	Curran, Art	All



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Other Appendices

4.2.1 Project Cost Breakdown:

Project Cost Breakdown			
Cost Category	sub-category	\$ (millions)	Name of Firm(s) providing
Personnel	NG Resources	0.140	
	SDC Time & Materials	0.009	IBM
	SDC Fixed-Price	0.624	Wipro,
	All other personnel	1.123	KPMG, Greenlight
	TOTAL Personnel Costs	1.896	
Hardware	Purchase	-	
	Lease	0.414	T-Systems
Software		1.280	
Risk Margin		0.583	
Other		0.126	
TOTAL Costs		4.299	

4.2.2 Benefiting Operating Companies:

This investment will benefit the following companies:

Benefiting Operating Companies	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. – Transmission	Transmission	NY
Niagara Mohawk Power Corp. – Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY



US Sanction Paper

Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA, NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc.	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp.	Service Company	
New England Electric Trans Corp	Inter Connector	MA



US Sanction Paper

4.2.3 IS Ongoing Operational Costs (RTB):

This project will increase IS ongoing operations support costs as per the following table. These are also known as Run the Business (RTB) costs.

Summary Analysis of RTB Costs							
All figures in \$ millions	Yr. 1 16/17	Yr. 2 17/18	Yr. 3 18/19	Yr. 4 19/20	Yr. 5 20/21	Yr. 6+	Total
Forecast of RTB Impact							
RTB if Status Quo Continues	-	-	-	-	-	-	-
RTB if Project is Implemented	0.036	0.409	0.409	0.409	0.409	0.314	1.986
Net change in RTB	0.036	0.409	0.409	0.409	0.409	0.314	1.986
RTB Variance Analysis (if Project is Implemented)							
Net Δ RTB funded by Plan(s)	-	-	-	-	-	-	-
Variance to Plan	0.036	0.409	0.409	0.409	0.409	0.314	1.986
Total RTB Costs - by Cost Type (if Project is Implemented)							
App.Sup. - SDC 1	-	-	-	-	-	-	-
App.Sup. - SDC 2	0.006	0.024	0.024	0.024	0.024	0.018	0.120
App.Sup. - other	-	-	-	-	-	-	-
SW maintenance	-	0.265	0.265	0.265	0.265	0.204	1.264
SaaS	-	-	-	-	-	-	-
HW support	0.030	0.120	0.120	0.120	0.120	0.092	0.602
Other: IS	-	-	-	-	-	(0.000)	(0.000)
All IS-related RTB (sub-Total)	0.036	0.409	0.409	0.409	0.409	0.314	1.986
Business Support (sub-Total)	-	-	-	-	-	-	-
Total RTB Costs	0.036	0.409	0.409	0.409	0.409	0.314	1.986

Financials for WO 90000172054 (KOB1 ran 1-26-18)

Sum of Val/COArea Crcy Order	Cost element descr.	Document Header Text	Total
90000172054	Accrued Contractor Costs	Finance Remediation Capex	-
	Allow Brwd Funds Dur Const-CR	Mar 2016 True up	161.20
	Allowance Funds Used During Construction	SVC8000:PP AFUDC	23,281.34
	Consultants	Finance Remediation Capex	1,835,120.96
	Int Income-AFUDC	Mar 2016 True up	(162.15)
Grand Total			1,858,401.35

National Grid USA

SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 24 HANA	Self-Service HANA Reporting
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Purpose

The purpose of this tab is to support the conclusion that the activities and resulting costs related to the deployment noted above were to enhance National Grid's SAP system. The costs for the work and activities identified in this tab were incurred during the Post Go-Live phase of National Grid's SAP implementation, and enhanced SAP as it was designed for go-live at November 5th, 2012.

Guidance

Per guidance in IAS 38 and ASC 250-40, activities that represent enhancement to the Company's SAP system are eligible for capitalization. Cost related to Design, Build, Test and Cutover are eligible for capitalization. Planning costs and Post go-live costs are not capitalizable activities.

Procedures

- 1- Analysis of enhancement: through meetings with Key Stakeholders as well as management, confirm that the activities performed meet the definition of an enhancement
- 2- Determination of costs capitalizable:
 - Obtained actual costs and forecast from Decision Support
- Obtain capitalization percentage from USFP PMO team. % of capitalization is determined based on new vs change items in the RICEFW

Conclusion

Consistent with IAS 38 (IFRS) and ASC Subtopic 350-40 (US GAAP), the activities described below are concluded to include enhancements to the Company's implemented SAP system. Costs related to Design, Build, Test and Cutover activities are capitalizable for those identified enhancements.

1. Analysis of Enhancements

1A: Project Overview:

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RTR 24 HANA	Self-Service HANA Reporting
	<p>As part of the ongoing initiatives to improve RTR reporting performance and migrate finance capabilities to HANA, National Grid has approved the following three Enhancement projects :</p> <ul style="list-style-type: none"> a. V5 solution transition to HANA: The current 'V5 solution residing on the legacy SAP Business Warehouse (BW) platform will be re-designed for the SAP F-IANA platform. The solution re-design approach will ntigrate the current V5 solution to SAP HANA platform and minimize disruptions to end users. All existing hierarchies and hierarchical reporting capabilities will be available in the V5 HANA solution. b. Employee Expense Solution: The current HANA End to End solution will be enhanced to add employee expense reporting capabilities. The enhancement will be used to analyze costs reported on the summary End to End solution in HANA by enabling employee expense cost traceability at a more granular level c. HANA End-to-End solution Enhancements: Implement Enhancements to the current HANA End-to-End solution

National Grid USA

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RTR 24 HANA	Self-Service HANA Reporting
1B: Project Scope:	
Please See detailed project scope in section 4.	
1C: Examples of Enhancement Activities performed	
Examples of Enhancement outputs include functional specifications, technical design documentations, test case documentation and cutover activities	

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SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 24 HANA	Self-Service HANA Reporting
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2. EHR1 Functional Structure

PMO and Program Management Integrated Delivery (Deloitte/Wipro)						
Pre-Go Live - Implementation Phase						
	Plan	Design	Build	Test	Go-Live/Deliver	PGLS
Payroll	<p>The objective of the Plan phase is to plan and prepare for the projects in the release, including establishing the project plan, releasing the charter, setting up the project governance structure, defining the tools to be used, and assigning resources. This phase also involves documenting the project scope and vision and the existing application landscape.</p>	<p>The objective of the Design phase is to create a detailed design and to document business requirements, business processes, software configuration design, software gaps, change impacts, application security, and technical infrastructure, To-be design documentation and arriving at the finalized RICEFW list and approved functional specifications. It should be noted that once an object has been approved/signed off the build may begin. The development team will perform an impact analysis to ensure that no incomplete objects could potentially impact the approved object. Performing this analysis mitigates the risk of rework on the approved object.</p>	<p>The objective of the Build phase is to focus on the configuration of the system and on custom development and Unit and Assembly Testing. The application development team will be primarily responsible for the build phase. They will build all RICEFW objects as documented from the design phase. As each of the objects are built, they will go through unit and assembly test.</p>	<p>The objective of the Test phase is to focus on testing and to confirm that the solution successfully meets the documented requirements. Testing will be coordinated centrally across the whole release. Two iterations of Integration Test will be performed sequentially followed by Volume, Payroll Comparison Testing, UAT, and Regression Test in parallel. Each of the process areas will designate business resources to support the testing phase. Entry and exit criteria for each test phase and stage gate will be documented in the test strategy document.</p> <p>The projects within each release have been grouped together to ensure a full integrated test across all process areas. The benefit of aligning testing is to manage the risk/impact of cross process area changes. A coordinated integration test of projects from all process areas will allow defects to be identified at an organizational level and not just within the specific process area silo.</p> <p>Methodology for end-user training will be documented in the Training Strategy document.</p>	<p>The objective of the Deliver phase is to prepare for and execute system and business cutover to the new environment, end-user training, conducting go/no-go evaluations and delivering the support organization to help the client after cutover.</p>	<p>The objective of the Post Go-Live Support phase is to ensure that the delivered solution is stable within the National Grid Production Environment. During the PGLS phase, all support tickets related to the delivered solution will be routed through the PGLS for resolution.</p>
Finance						
Supply Chain						
BPS						
CF						

National Grid USA
SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 24	Self-Service HANA Reporting
HANA	

3. Determination of Capitalized Costs

Total FY16 Capex	
Deloitte	\$ 1,553,795.90
Total	1,553,795.90

National Grid USA
SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 24 HANA	Self-Service HANA Reporting
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3a. Vendors COST Analysis

Implementati on Phases	Phase Activities	Phase Deliverables (Examples*)	Delivery Date	Total FY16 Costs (Deloitte)	Pre-Go Live Implementati on Costs	Phase Capitaliza ble (Y/N)?	% of Project Efforts Spent on Enhance ments ("New Objects")	Capitalizable Costs for Enhancements Built
Planning	Establishing the project plan, releasing the charter, setting up the project governance structure, defining the tools to be used, and assigning resources; documenting the project scope and vision and the existing application landscape	1. Business Case 2. EHR1 Charter 3. Integrated Project Plan 4. Plan on a Page	N/A	-		N	-	
Design	Creating a detailed design and to document business requirements, business processes, software configuration design, software gaps, change impacts, application security, and technical infrastructure, To-be design documentation and arriving at the finalized RICEFW list and approved functional specifications.	1. RICEFW List 2. Functional Specifications 3. Business Intelligence Functional Design Specifications (Front-End Design) 4. Business Requirements and Traceability Matrix 5. To-Be Process Design	1/31/2016	\$ 2,071,728	2,071,728	Y	75%	1,553,795.90
Build	Configuration of the system and on custom development and Unit and Assembly Testing. Application development team will build all RICEFW objects as documented from the design phase. As each of the objects are built, they will go through unit and assembly test.	1. Security Base Role Design 2. Configuration Specification 3. Technical Specifications 4. Business Intelligence Technical Design Specifications 5. Test Plan and Scope for ITC1/2 (Green Bar Chart)						
Testing	Performing two iterations of Integration Test sequentially followed by Performance, UAT, and Regression Test in parallel. Each of the process areas will designate business resources to support the testing phase. Entry and exit criteria for each test phase and stage gate will be documented in the test strategy document. Conducting a full integrated test across all process areas to confirm that the solution successfully meets the documented requirements. Testing will be coordinated centrally across the whole release.	1. Test Plan and Scope for Regression/UAT/Volume (Green Bar Chart) 2. Test Scenarios and Scripts for Regression/UAT/Volume 3. Role to position mapping 4. Test Cycle Exit Report 5. Release Go/No-Go Criteria						
Go-Live (Release Independent)	Prepare for and execute system and business cutover to the new environment, end-user training, conducting go/no-go evaluations and delivering the support organization to help the client after cutover	1. Training Delivery (Not Capitalizable, and no training costs have been incurred through March 2015) 2. Go / No Go Phase Gate 3. Storm Check - Go / No Go Decision 4. Lessons Learned (Not capitalizable, no costs incurred through Mar 2015) 5. Service Transfer Handover Document (STHD)						
PGLS	Ensure that the delivered solution is stable within the National Grid Production Environment. During the PGLS phase, all support tickets related to the delivered solution will be routed through the PGLS for resolution.	Post-Go Live Support	Feb 2016	-				
			2,071,728	2,071,728	2,071,728		75%	\$ 1,553,796

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RTR 24 HANA	Self-Service HANA Reporting
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A↓

C

D↓

* This is a list of the deliverables produced by all project teams in EHR1. It should be noted that due to the varying scope of the projects packaged within EHR1 not all projects will be required produce every deliverable document listed.

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RTR 24 HANA	Self-Service HANA Reporting
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3b. Deloitte Invoices Support

Process Stream	Project ID	Initiative ID	Project Name
RTR	RTR 24 HANA	N/A	Self-Service HANA Reporting

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RTR 24 HANA	Self-Service HANA Reporting
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Actual cost

Service Period	Invoice #	Invoice Date	Labor Fees (\$)	Volume Disc't % for Labor Fees	1% Disc't for early invoice payment	1% Disc't for one-time timely payment	Debit	Labor Fees (\$ - After disc't)	Expenses (\$)	Total (\$)
Apr-15								-		-
May-15								-		-
Jun-15								-		-
Jul 2015	8002462785	8/27/2015	130,680					130,680.00	16,250	146,930
Aug 2015	8002478432	9/21/2015	253,515					253,515	29,534	283,049
Sept 2015	8002514192	11/13/2015	331,375		1,426			329,949	37,925	367,874
Oct-15	8002522996	11/25/2015	289,560	3%	2,535		11,170	289,172.95	33,908	323,081
Nov-15	8002542830	1/6/2015	327,175	3%	3,314			314,046	47,778	361,824
Dec-16	8002566755	2/4/2016	149,938	3%	1,504			143,936	29,096	173,032
Dec-15	8002566752	2/4/2016	149,938	3%	1,504			143,936	29,096	173,032
Jan-16	8002577827	2/23/2016	114,440	3%	1,636			109,371	10,468	119,839
Jan-16	8002577842	2/23/2016	117,770	3%	1,636			112,601	10,468	123,069
Feb-16	8002593479	3/14/2016	124,968	3%			4420	125,638.48	23,956	149,594
Feb-16	8002593480	3/14/2016	124,968	3%			4420	125,638.48	23,956	149,594

\$ 2,370,917

EHR1

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RTR 24 HANA	Self-Service HANA Reporting
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4. Appendix - Enhancement Support

Based on review of the scope of services provided, management estimated 75% of the total project spend is capitalizable.

RTR-24 HANA Project Scope

The following activities are performed in support of the design, build, test and delivery of RTR-24 HANA project

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RTR 24 HANA	Self-Service HANA Reporting
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V5 solution transition to HANA Enhancement

- Perform Gap Analysis to align the current V5 solution with National Grid approved functional specification.
- Identification of BEx queries, WebI reports and Universes that need to be transitioned to F-IANA. The queries and Universes will then be re-built on top of the new V5 HANA solution. SEx query re-build will be limited to no more than 10 objects.
- Develop technical design specifications for V5 F-IANA solution based on the National Grid approved functional specification.
- Perform build and unit test activities for VS HANA solution based on the technical specification developed from National Grid's Functional specification.
- Perform Data Provisioning using the SAP Landscape Transformation tool or the SAP Business Warehouse ("BW") data loads to source data for VS HANA solution on SAP HANA platform.
- Transport the code for this Enhancement between the HANA Development and Quality Assurance (QA) environments, including transport of the code from the HANA QA environment to the HANA production environment.
- Develop Green Bar Chart and test scripts for Integration Testing Cycle and User Acceptance Testing, as per the documented functional requirements.
 - Perform Integration Testing, User Acceptance Testing on the V5 F-IANA solution.
 - Integration testing will include test cases that will test the report performance
- Develop a cutover plan and support cutover activities for the V5 HANA solution and align with the EHR1 cutover team to incorporate changes in National Grid's overall cutover plan.
 - Provide post Go-live support to address Defects related to the VS HANA solution.
- Coordinate knowledge transfer with National Grid to be performed during the post go-live support period.
 - Provide periodic status reporting on V5 hANA solution Services progress.
- Support incident resolution related to the HANA project environment with National Grid's HANA Enterprise Cloud team

Costs Allocation	% Activities eligible for capex	Capex % used
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80%

75%

60%

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RTR 24 HANA	Self-Service HANA Reporting
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Employee Expense Solution Enhancement

Costs Allocation	% Activities eligible for capex	Capex % used
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- Develop technical design specifications for reporting requirements based on the National Grid approved functional specification for RICEFW ID E3557
 - Perform build and unit test activities on developed objects for the Employee Expense Solution Enhancement.
- Modify National Grid's existing queries for the [IANA End to End solution to deliver the requirements documented in the National Grid approved functional specification for these enhancement
- Perform Data Provisioning using the SAP Landscape Transformation tool or the SAP Business Warehouse ("BW") data loads to source data for Employee Expense Solution Enhancement.
- Transport the code for the Enhancements between the HANA Development and QA environments, including transporting code from the HANA QA environment to the HANA production environment.
 - Develop Green Bar Chart and test scripts for Integration Testing Cycle, User Acceptance Testing, and Regression Testing related to the Enhancements per the functional requirements
 - Perform Integration Testing, Regression Testing, User Acceptance Testing on the Employee Expense Solution.
- Develop a cutover plan and support cutover activities for the Enhancements to the HANA End to End Solution and align with the EHR1 cutover team to incorporate changes in the overall cutover plan.
 - Provide post Go-live support to address Defects related to the Enhancement to the HANA End to End solution.
 - Coordinate knowledge transfer with National Grid to be performed during the post go-live support period.
 - Provide periodic status reporting on Employee Expense Solution Services progress.
- Support incident resolution related to the HANA project environment with National Grid's HANA Enterprise Cloud team

10%

75%

8%

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RTR 24 HANA	Self-Service HANA Reporting
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HANA End to End solution Enhancement

	Costs Allocation	% Activities eligible for capex	Capex % used
<ul style="list-style-type: none"> • Develop technical design specifications for reporting requirements based on National Grid approved Change Requests per the Enhancements <ul style="list-style-type: none"> • Perform build and unit test activities to perform the Enhancements to the current HANA End to End solution. The functional requirements for the Enhancements are documented in National Grid approved CR <ul style="list-style-type: none"> • Modify existing queries for HANA End to End solution to deliver the requirements • Perform Data Provisioning using the SAP Landscape Transformation tool or the SAP Business Warehouse ("BW") data loads to source data for the CR requirements • Transport the code for the Enhancements between the HANA Development and HANA QA environments, and transport of code from the HANA QA environment to the HANA production environment. <ul style="list-style-type: none"> • Develop Green Bar Chart and test scripts for Integration Testing Cycle, User Acceptance Testing, and Regression Testing for the Enhancements <ul style="list-style-type: none"> • Perform Integration Testing, Regression Testing, User Acceptance Testing on the HANA End to End solution Enhancements • Develop a cutover plan and support cutover activities for the Enhancements to the HANA End to End Solution and align with the EHRI cutover team to incorporate changes in the overall cutover plan. <ul style="list-style-type: none"> • Provide post Go-live support to address Defects related to the Enhancements to HANA End to End solution • Coordinate knowledge transfer with National Grid to be performed during the post go-live support period. <ul style="list-style-type: none"> • Provide periodic status reporting on the HANA End to End Solution Enhancements Services progress. • Support incident resolution related to the HANA project environment with HANA Enterprise Cloud team • Load historical data for FY13, FY14, FY15, FY16 for E2E solution from BW on Oracle to BW on HANA 	10%	75%	8%
Total % of Capex used			75%

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RTR 23 HANA	Implementation of SAP Simple Finance (SFIn)/ FERC HANA Solution
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Purpose

The purpose of this tab is to support the conclusion that the activities and resulting costs related to the deployment noted above were to enhance National Grid's SAP system. The costs for the work and activities identified in this tab were incurred during the Post Go-Live phase of National Grid's SAP implementation, and enhanced SAP as it was designed for go-live at November 5th, 2012.

Guidance

Per guidance in IAS 38 and ASC 250-40, activities that represent enhancement to the Company's SAP system are eligible for capitalization. Cost related to Design, Build, Test and Cutover are eligible for capitalization. Planning costs and Post go-live costs are not capitalizable activities.

Procedures

- 1- Analysis of enhancement: through meetings with Key Stakeholders as well as management, confirm that the activities performed meet the definition of an enhancement

Conclusion

Consistent with IAS 38 (IFRS) and ASC Subtopic 350-40 (US GAAP), the activities described below are concluded to include enhancements to the Company's implemented SAP system. Costs related to Design, Build, Test and Cutover activities are capitalizable for those identified enhancements.

1. Analysis of Enhancements

1A: Project Overview:

National Grid is implementing the SAP Simple Finance (SFIn) solution on HANA Enterprise Cloud (HEC) to provide improved FERC reporting. This includes implementation of the SAP Master Data Governance (MDG) solution for financial master data, FERC expertise, and Delivery & Project Management over the implementation of MDG and SFIn for FERC. This project includes components that run in, and activities to be executed in both the SAP MEG environment and National Grid's SAP ECC system.

1B: Project Scope:

Please See detailed project scope in section 4.

1C: Examples of Enhancement Activities performed

Examples of Enhancement outputs include functional specifications, technical design documentations, test case documentation and cutover activities

National Grid USA
SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 23 HANA	Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution
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2. EHR1 Functional Structure

PMO and Program Managemenet Integrated Delivery (Deloitte/Wipro)						
Pre-Go Live - Implementation Phase						
	Plan	Design	Build	Test	Go-Live/Deliver	PGLS
Payroll	The objective of the Plan phase it to plan and prepare for the projects in the release, including establishing the project plan, releasing the charter, setting up the project governance structure, defining the tools to be used, and assigning resources. This phase also involves documenting the project scope and vision and the existing application landscape.	The objective of the Design phase is to create a detailed design and to document business requirements, business processes, software configuration design, software gaps, change impacts, application security, and technical infrastructure, To-be design documentation and arriving at the finalized RICEFW list and approved functional specifications. It should be noted that once an object has been approved/signed off the build may begin. The development team will perform an impact analysis to ensure that no incomplete objects could potentially impact the approved object. Performing this analysis mitigates the risk of rework on the approved object.	The objective of the Build phase is to focus on the configuration of the system and on custom development and Unit and Assembly Testing. The application development team will be primarily responsible for the build phase. They will build all RICEFW objects as documented from the design phase. As each of the objects are built, they will go through unit and assembly test.	The objective of the Test phase is to focus on testing and to confirm that the solution successfully meets the documented requirements. Testing will be coordinated centrally across the whole release. Two iterations of Integration Test will be performed sequentially followed by Volume, Payroll Comparison Testing, UAT, and Regression Test in parallel. Each of the process areas will designate business resources to support the testing phase. Entry and exit criteria for each test phase and stage gate will be documented in the test strategy document. The projects within each release have been grouped together to ensure a full integrated test across all process areas. The benefit of aligning testing is to manage the risk/impact of cross process area changes. A coordinated integration test of projects from all process areas will allow defects to be identified at an organizational level and not just within the specific process area silo. Methodology for end-user training will be documented in the Training Strategy document.	The objective of the Deliver phase is to prepare for and execute system and business cutover to the new environment, end-user training, conducting go/no-go evaluations and delivering the support organization to help the client after cutover.	The objective of the Post Go-Live Support phase is to ensure that the delivered solution is stable within the National Grid Production Environment. During the PGLS phase, all support tickets related to the delivered solution will be routed through the PGLS for resolution.
Finance						
Supply Chain						
BPS						
CF						

3. Determination of Capitalized Costs

	Total FY16 Capex		SAP GL JE	
Deloitte	\$	281,325.06	\$	281,325
SAP	\$	3,095,009		2,961,000
KPMG	\$	-		
Total	\$	3,376,334	\$	3,242,325.06
			\$	(134,008.69)

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SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 23 HANA		Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution									
3a. Vendors COST Analysis											
Implementation Phases	Phase Activities	Phase Deliverables (Examples*)	Delivery Date	Total FY16 Costs (Deloitte)	Total FY16 Costs (SAP)	Total FY16 Costs (KPMG)	Total vendor costs	Pre-Go Live Implementation Costs	Phase Capitalizable (Y/N)?	% of Project Efforts Spent on Enhancements ("New Objects")	Capitalizable Costs for Enhancements Built
Planning	Establishing the project plan, releasing the charter, setting up the project governance structure, defining the tools to be used, and assigning resources; documenting the project scope and vision and the existing application landscape	1. Business Case 2. EHR1 Charter 3. Integrated Project Plan 4. Plan on a Page	N/A	-					N	-	
Design	Creating a detailed design and to document business requirements, business processes, software configuration design, software gaps, change impacts, application security, and technical infrastructure, To-be design documentation and arriving at the finalized RICEFW list and approved functional specifications.	1. RICEFW List 2. Functional Specifications 3. Business Intelligence Functional Design Specifications (Front-End Design) 4. Business Requirements and Traceability Matrix 5. To-Be Process Design	3/31/2016	\$ 281,325	\$ 1,827,386	\$ 133,058		281,325	Y	Various	
Build	Configuration of the system and on custom development and Unit and Assembly Testing. Application development team will build all RICEFW objects as documented from the design phase. As each of the objects are built, they will go through unit and assembly test.	1. Security Base Role Design 2. Configuration Specification 3. Technical Specifications 4. Business Intelligence Technical Design Specifications 5. Test Plan and Scope for ITC1/2 (Green Bar Chart)									
Testing	Performing two iterations of Integration Test sequentially followed by Performance, UAT, and Regression Test in parallel. Each of the process areas will designate business resources to support the testing phase. Entry and exit criteria for each test phase and stage gate will be documented in the test strategy document. Conducting a full integrated test across all process areas to confirm that the solution successfully meets the documented requirements. Testing will be coordinated centrally across the whole release.	1. Test Plan and Scope for Regression/UAT/Volume (Green Bar Chart) 2. Test Scenarios and Scripts for Regression/UAT/Volume 3. Role to position mapping 4. Test Cycle Exit Report 5. Release Go/No-Go Criteria									
Go-Live (Release Independent)	Prepare for and execute system and business cutover to the new environment, end-user training, conducting go/no-go evaluations and delivering the support organization to help the client after cutover	1. Training Delivery (Not Capitalizable, and no training costs have been incurred through March 2015) 2. Go / No Go Phase Gate 3. Storm Check - Go / No Go Decision 4. Lessons Learned (Not capitalizable, no costs incurred through Mar 2015) 5. Service Transfer Handover Document (STHD)									
PGLS	Ensure that the delivered solution is stable within the National Grid Production Environment. During the PGLS phase, all support tickets related to the delivered solution will be routed through the PGLS for resolution.	Post-Go Live Support	TBD								
				281,325	1,827,386	133,058	2,241,769	281,325		Various	
				A ₁	B ₂	C	D ₁	E=C*D			

* This is a list of the deliverables produced by all project teams in EHR1. It should be noted that due to the varying scope of the projects packaged within EHR1 not all projects will be required produce every deliverable document listed.

National Grid USA
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RTR 23 HANA	Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution
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3b. Invoices Support

Process Stream	Project ID	Initiative ID	Project Name
RTR	RTR 23 HANA	N/A	Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution

SAP

License Charge-back from UK	Posted JE	Descriptions	
Software	74,632.61	SAP Ex 38 Annual S&M X5020015201 rechg and Oracle	74,633
Software	752,598.84	SAP Ex 38 Lic X5020015201 rechg and Oracle	752,599
		ISOP00115 Max Attention 252 days	<u>1,409,622</u>
			2,236,854

PO	PO Year	Project Name	Recharge amount	NG USA G/L	NG USA G/L Description	Location	Accounting Information	Recharge Status	Recharged month	No of days
3200529934	2014	FERC	175,881	265,976	Max Attention FERC PO3200529934 90000156074	US	90000156074	Recharged	Sep'15	263
		FERC	175,881	118,482	Max Attention 2015 Inv US - USFP (SEPT)	US	90000156074	Recharged	Oct'15	
3200629642	2015	FERC	409,275	496,458	ISOP00115 Max Attention 252 days	US	90000156074	Recharged	Jan'16	306
3200598111	2015	FERC	409,275	470,050	(no description provided)	US	90000156074	Recharged	Mar'16	252
3200524837	2015	FERC	38,788	58,656	Max Attention FERC PO3200524837 90000156074	US	90000156074	Recharged	Oct'15	29
			£1,209,100	\$1,409,622						

National Grid USA
SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 23 HANA	Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution
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Service Period	Invoice #	Invoice Date	Labor Fees (\$)	Expenses (\$)	Total (\$)	Capex Amount
Jan-Mar 2016 (Based on Project statement)					849,530	541,575.38
					\$ 849,530	

please detailed breakout below

Scope Service	Scope Services Description	Costs Allocated	% Activities eligible f	Capex % used
Project management	<ul style="list-style-type: none"> • Conduct Oversight Management – reporting and controlling of the Project; define, develop, document and maintain a written Project schedule (WBS) to track the progress and estimate to completion of the Project • SAP Project Manager – prior to project preparation, SAP will assign a suitably qualified and experienced Project Manager who shall be the owner of the Project and responsible for the controls, implementation, scope management, management of costs and resources for the solution (subject to National Grid approval) • Document scenario, test scripts and conduct integration and user acceptance testing for MDG for Realization Phase sign-off with National Grid • Create and document a written transition plan for the MDG solution hand-over and support for National Grid IT (or its nominee) (AMS – Application Management Support) • Conduct a comprehensive and documented knowledge transfer of MDG to National Grid IT (or its nominee) (AMS – Application Management Support; current Enduring Business Support organization for National Grid) • Create a written Service Transition Document and obtain National Grid acceptance and sign-off 	10%	0%	0%
SAP S4/Finance (SFin) EXPERTISE	<ul style="list-style-type: none"> • Complete the data migration and technical stability activities for SFin • Fix AIF errors and re-run posting of all relevant FI/CO documents for January and February 2016 • Complete the agreed Punch List items required for initial reconciliation 	75%	75%	56%
FERC (Federal Energy Regulatory Commission) EXPERTISE	<ul style="list-style-type: none"> • Provide all necessary expertise to enable the FERC process and mappings 	5%	50%	3%
MDG	<ul style="list-style-type: none"> • Complete the documentation of the MDG Solution and its operating principles to National Grid (or its nominee) and Application Support 	10%	50%	5%
		64%		64%

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RTR 23 HANA	Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution
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Service Period	Invoice #	Invoice Date	Labor Fees (\$)	Expenses (\$)	Total (\$)
MAY '15 - OCT '15	8008259393	11/23/2015			970,050
MAY '15 - OCT '15	8008260620				7,806

\$ 977,856

please
detailed
breakout
below

Role/Service Description	Labor	Expense	Total	SAP credit	Total (after credit)	Capex %	Capex Amount
Testing	237,600		237,600			100%	237,600
General consultation/Project management	275,000	2.76	275,003			50%	137,501
General consultation/Project management	165,000		165,000			50%	82,500
Installation	18,000	7800	25,800			100%	25,800
Blueprint/Requirement Gathering	44,000	1.17	44,001			100%	44,001
General consultation/Project management	144,650	1.88	144,652			50%	72,326
Data Conversion/Migration	85,800		85,800			100%	85,800
	970,050	7805.81	977,856	500000	477,856	66%	\$ 316,579

based on discussion with management

National Grid USA
SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 23 HANA		Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution
Project phase	Estimated completion date	Activities completed
Start	May-15	<ul style="list-style-type: none"> perform a detailed installation check to confirm the technical prerequisites for the start of deployment are met <ul style="list-style-type: none"> document and communicate the delivery approach The approach and content of the MOG POC will be presented and jointly agreed <ul style="list-style-type: none"> prepare a written Project timeline by project phase for approval
Deploy Phase	Aug-15	<ul style="list-style-type: none"> Activate the solution scope of the Project in the Licensee's development environment. Complete the configuration of the standard RDS options to which NG agreed during the Start Phase Confirm that the solution has been activated without issues by executing a Unit Test. A Unit Test validates that individual functions are configured to appropriately translate technical and functional requirement. This would include testing of individual configuration elements, process steps associated with business transactions, and custom development objects. <ul style="list-style-type: none"> Execute Unit Testing only in the DEV system Determine whether User-Defined Options and/or additional Custom objects are required <ul style="list-style-type: none"> Import the solution into the licensee's quality assurance system(s) Import Licensee data for the purpose of Licensee user acceptance testing. Resolve defects found during the testing that are related to the implementation of this Project.
Finalize	Nov-15	<ul style="list-style-type: none"> Import the solution into the Licensee's production system(s) and Production assist Licensee with technical validation of the import.
Run and Project closure	Nov-15	<ul style="list-style-type: none"> Go-Live and Post-go live support

Deloitte

National Grid USA
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RTR 23 HANA

Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution

Service Period	Invoice #	Invoice Date	Labor Fees (\$)	Volume Disc % for Labor Fees	1% Disc for early invoice payment	1% Disc for one-time timely payment	Debit	Labor Fees (\$) - After disc	Expenses (\$)	Total (\$)
Dec-15	8002566770	2/4/2016	176,435	3%				171,142	25,340	196,482
Jan-16	8002577744	2/22/2016	51,675	3%				50,125	2,094	52,219
Feb-16	8002594278	3/14/2016	33,300	3%				32,301.00	323	32,624
										\$ 281,325

Enhancement Description	Requirement	Total Costs	Capex %	Capex \$
SAP Design Documents ("SDD") for the sFin and MDG Projects	A document providing technical details on the design of the sFin and MDG security roles including underlying authorization objects, impacted systems, and alignment to existing National Grid security access profiles.	\$ 140,662.53	100%	\$ 140,662.53
Control Definition Document	A set of documents defining the identified risk, mitigating control activity, and operating procedures for the information technology general computing controls (ITGC5) and General Ledger controls for sFin and MDG. This will consist of updates to existing documentation from the control frameworks currently utilized in the Company SAP ECC environment.	\$ 140,662.53	100%	\$ 140,662.53
		\$ 281,325.06		\$ 281,325.06

KPMG

Service Period	Invoice #	Invoice Date	Labor Fees (\$)	Expenses (\$)	Total (\$)
Jan-16	8000984342	2/23/2016	46,480	3,574	50,054
Feb-16	8001013317	3/15/2016	74,240	8,764	83,004
					\$ 133,058

Based on review of project scope, KPMG provided loan staff support in connection with RTR-23 HANA project. Project spend will be expensed as a result.

4. Appendix - Enhancement Support

RTR-23 HANA Project Scope

The following activities are performed in support of the design, build, test and delivery of RTR-23 HANA project

National Grid USA

SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 23 HANA

Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution

SAP Project Scope

Master Data Governance

1.1.1 Functional Prerequisites

The following functionality will be activated within the HEC productive system(s), before the start of the MOG Project:

1. Software Prerequisites and Installation
 - a. Product required minimum SF5 (see Note 1801006)
 - b. EHP6 FOR SAP ERP 6.0 SPS: 09 (10/2013) see note 1496212
 - c. EHP7 FOR SAP ERP 6.0 SPS: 02(11/2013) see note 1737650
2. No existing Master Data Management application systems - SAP will build DEV, QA and PRO environments.

1.1.2 Technical Building Blocks

The technical building blocks that will be implemented for each MDC scope

1.2 Development Scope

The following custom objects are in scope for this project:

- Loading GL Co code extension 51<91
- Transformation of Account group (or sPin requirements)

A single custom object for GL Account Types will be implemented as part of the P0G. All other objects will be standard MUG objects. For the avoidance of doubt, the FERC Accounts (the 9' series of accounts) are included as standard MDC objects.

85% 75% 63.75%

FERC (Federal Energy Regulatory Commission) Expertise

- Enable the FERC process and mappings
- Provide a comprehensive and documented knowledge transfer of the final SAP SFin FERC HANA Solution and its operating principles to National Grid and Application Support

5% 50% 2.50%

Project Management

Conduct Oversight Management — reporting and controlling of the Project; define, develop, document and maintain a written Project Schedule (WBS) to track the progress and estimate to completion of the Project

- Integrate project milestones into the overall EHR1 Project Plan
- Document scenario, test scripts and conduct integration and user acceptance testing for Realization Phase sign-off
- Create and document a written transition plan for the solution hand-over and support (AMS — Application Management Support)
- Conduct a comprehensive and documented knowledge transfer (AMS — Application Management Support)
- Assess completeness and quality review of production environment readiness for acceptance and sign-off

10% 0% 0.00%
66.25%

National Grid USA

SAP Post Go-Live Enhancements - EHR1 Fall Release

RTR 23 HANA	Implementation of SAP Simple Finance (SFIN)/ FERC HANA Solution
Deloitte project scope	
Enhancement	
Deliverables	Requirement
SAP Design Documents ("SDD") for the sFin and MDG Projects	A document providing technical details on the design of the sFin and MDG security roles including underlying authorization objects, impacted systems, and alignment to existing National Grid security access profiles.
Control Definition Document	A set of documents defining the identified risk, mitigating control activity, and operating procedures for the information technology general computing controls (ITGC5) and General Ledger controls for sFin and MDG. This will consist of updates to existing documentation from the control frameworks currently utilized in the Company SAP ECC environment.

KPMG project scope

KPMG provided loan staff support in connection with RTR-23 HANA project

EHR1 - IT Delivery Financials

<u>Order</u>	<u>Order Description</u>	<u>Cost Description</u>	<u>Vendor Name</u>	Fiscal Year			<u>Grand Total</u>
				<u>2015</u>	<u>2016</u>	<u>2017</u>	
90000148061	EHR1 - IT Delivery	AFUDC		466.78	177,807.10	44,616.33	222,890.21
		Consultants			1,295,961.00		1,295,961.00
			SAP AMERICA INC.	521,092.00			521,092.00
		Contractors			(0.00)		(0.00)
		Software		528,940.79			528,940.79
Grand Total				1,050,499.57	1,473,768.10	44,616.33	2,568,884.00

Notes: SAP America INC Consulting Costs for Multiple EHR1 Workstreams
HANA Licenses



PO #: 3200124736
Confirmation: 6000366639 12/15/14
Accounting: 90000148061

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008247702 as of 10/30/2014		327,197.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Invoice for HANA Production and Initial Use Cases, OCTOBER 2014, per the Monthly Fixed Fee Payment Schedule.

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	327,197.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 12-16-14: 07:55:33 Received



Invoice No. 8008247702 as of 10/30/2014	327,197.00 USD
--	-----------------------

Total net value	327,197.00 USD
Invoice Total	327,197.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 12-16-14: 07:55:33 Received



SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008245649 as of 08/27/2014		193,895.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

HANA Production and Initial Use Cases
PRD Build Complete

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	193,895.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 01-05-15: 13:23:37 Received



Invoice No. 8008245649 as of 08/27/2014	193,895.00 USD
--	-----------------------

Total net value	193,895.00 USD
Invoice Total	193,895.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 01-05-15: 13:23:37 Received



PO #: 3200124736
Confirmation: 6000408449 3/5/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008248600 as of 11/30/2014		157,054.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Milestone 6

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	157,054.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 03-05-15: 10:55:46 Received



Invoice No. 8008248600 as of 11/30/2014	157,054.00 USD
--	-----------------------

Total net value	157,054.00 USD
Invoice Total	157,054.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 03-05-15: 10:55:46 Received



PO #: 3200124736
Confirmation: 6000426081 4/2/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008251427 as of 03/20/2015		157,055.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Milestone M5a # Payroll Acceleration Development Phase complete

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	157,055.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 04-02-15: 13:03:15 Received



Invoice No. 8008251427 as of 03/20/2015	157,055.00 USD
--	-----------------------

Total net value	157,055.00 USD
Invoice Total	157,055.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 04-02-15: 13:03:15 Received



PO #: 3200124736
Confirmation: 6000426085 4/2/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008251428 as of 03/20/2015		157,054.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Milestone M8c - SCM Data Optimization

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	157,054.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 04-02-15: 13:03:28 Received



Invoice No. 8008251428 as of 03/20/2015	157,054.00 USD
--	-----------------------

Total net value	157,054.00 USD
Invoice Total	157,054.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 04-02-15: 13:03:28 Received



PO #: 3200124736
Confirmation: 6000426074 4/2/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008251511 as of 03/23/2015		42,068.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

BMM6 - Real Time MM Storm Event

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	42,068.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 04-02-15: 13:03:41 Received



Invoice No. 8008251511 as of 03/23/2015	42,068.00 USD
--	----------------------

Total net value	42,068.00 USD
Invoice Total	42,068.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 04-02-15: 13:03:41 Received



PO #: 3200124736
Confirmation: 6000426076 4/2/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008251516 as of 03/23/2015		25,560.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

BMM6a, Real Time MM Store Event - 3 additional z-tables

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	25,560.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 04-02-15: 13:02:48 Received



Invoice No. 8008251516 as of 03/23/2015	25,560.00 USD
--	----------------------

Total net value	25,560.00 USD
Invoice Total	25,560.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 04-02-15: 13:02:48 Received



PO #: 3200124736
Confirmation: 6000426071 4/2/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008251170 as of 03/12/2015		33,600.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Business Metric Milestone BMM4b; Timesheet UC # 6 enhancements

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	33,600.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 04-02-15: 13:03:02 Received



Invoice No. 8008251170 as of 03/12/2015	33,600.00 USD
--	----------------------

Total net value	33,600.00 USD
Invoice Total	33,600.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 04-02-15: 13:03:02 Received



PO #: 3200124736
Confirmation: 6000445977 5/13/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008252983 as of 04/29/2015		42,068.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Bmm5a - Payroll Acceleration Testing complete

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	42,068.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-13-15: 15:13:39Received



Invoice No. 8008252983 as of 04/29/2015	42,068.00 USD
--	----------------------

Total net value	42,068.00 USD
Invoice Total	42,068.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-13-15: 15:13:39Received



PO #: 3200124736
Confirmation: 6000445972 5/13/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008252982 as of 04/29/2015		157,054.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Milestone M8a - Development Phase 2 Complete (FI-E2E1-T).

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	157,054.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-13-15: 15:13:58Received



Invoice No. 8008252982 as of 04/29/2015	157,054.00 USD
--	-----------------------

Total net value	157,054.00 USD
Invoice Total	157,054.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-13-15: 15:13:58Received



PO #: 3200124736
Confirmation: 6000445990 5/13/15
Accounting: 90000142344

SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

Invoice No. 8008252039 as of 03/31/2015		157,054.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Milestone M7a - FIE2E Development phase 1 complete

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	157,054.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-13-15: 15:13:45Received



Invoice No. 8008252039 as of 03/31/2015	157,054.00 USD
--	-----------------------

Total net value	157,054.00 USD
Invoice Total	157,054.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-13-15: 15:13:45Received



SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

PO #: 3200124736
Confirmation: 6000448878 5/18/15
Accounting: 90000142344

Invoice No. 8008253011 as of 04/30/2015		42,068.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Bmm7b # Productivity reporting

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	42,068.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-20-15: 07:13:56Received



Invoice No. 8008253011 as of 04/30/2015	42,068.00 USD
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Total net value	42,068.00 USD
Invoice Total	42,068.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-20-15: 07:13:56Received



SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

PO #: 3200124736 Confirmation: 6000448894 5/18/15 Accounting: 90000142344

Invoice No. 8008253014 as of 04/30/2015		42,068.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

Bmm7c - Operational Labor Reports

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	42,068.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-20-15: 07:14:01Received



Invoice No. 8008253014 as of 04/30/2015	42,068.00 USD
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Total net value	42,068.00 USD
Invoice Total	42,068.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-20-15: 07:14:01Received



SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

PO #: 3200124736 Confirmation: 6000448896 5/18/15 Accounting: 90000142344

Invoice No. 8008253019 as of 05/11/2015		120,595.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

M11 - HR Master Data SWAP Jan #15 # PCR010

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	120,595.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-20-15: 07:14:06Received



Invoice No. 8008253019 as of 05/11/2015	120,595.00 USD
--	-----------------------

Total net value	120,595.00 USD
Invoice Total	120,595.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-20-15: 07:14:06Received



SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

PO #: 3200124736
Confirmation: 6000448899 5/18/15
Accounting: 90000142344

Invoice No. 8008253020 as of 05/11/2015		120,595.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

M12 - HR Master Data SWAP Jan #15# PCR010

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	120,595.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-20-15: 07:14:11Received



Invoice No. 8008253020 as of 05/11/2015	120,595.00 USD
--	-----------------------

Total net value	120,595.00 USD
Invoice Total	120,595.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-20-15: 07:14:11Received



SAP America, 3999 West Chester Pike, Newtown Square, PA 19073

SAP America, Inc.

National Grid USFP
Attn: Accounts Payable
300 Erie Blvd West
SYRACUSE NY 13202
United States

PO #: 3200124736
Confirmation: 6000449186 5/18/15
Accounting: 90000142344

Invoice No. 8008252990 as of 04/30/2015		42,068.00 USD
Contract Number:	3951043 of 03/31/2014	
Order Number	NAUT 3951043 of 03/31/2014	
PO Number:	3200124736, Line 1 of 08/02/2014	
Sold-to-Party:	692346, National Grid, SYRACUSE, United States	
Ship-to-Party:	692346, National Grid, Waltham, MIDDLESEX, MA, United States	
Bill-to-Party:	692346, National Grid USFP, SYRACUSE, United States	
Contact person:	Accounts Receivable - FinanceAR@sap.com, Fax +1-650-847-2663	

SCM Data Optimization final testing complete.

This invoice covers consulting services as follows:

Activity	Amount
FPP -Fix price project	42,068.00 USD

Please remit payment to the following (indicate invoice # on remittance)
ACH (Preferred Method) or Wires: SAP America, Inc., Account 6213780843, Citizens Bank of PA, ABA 036076150 SWIFT CTZIUS33 or
Checks: SAP America, Inc., P.O. Box 7780-824024, Philadelphia, PA 19182-4024
Federal Tax Identification Number: #36 - 3556041

Accounts Payable 05-20-15: 07:14:16Received



Invoice No. 8008252990 as of 04/30/2015	42,068.00 USD
--	----------------------

Total net value	42,068.00 USD
Invoice Total	42,068.00 USD

Payment Terms: Within 30 days due net

NOTE: SAP is offering a new, free website which allows you to retrieve your account information any time, day or night. Biller Direct is a secure, password- and access-protected website which allows you to pay invoices with a credit card, obtain invoice copies and attachments as well as to submit questions to SAP regarding your account. To register online visit https://directbilling.sap.com/bd/public/registration/bd_registration.htm. If you have any questions, you may call 1-888-SAP-BILL or email Billerdirect.na@sap.com

Accounts Payable 05-20-15: 07:14:16Received

Resanction Request

Title:	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	Sanction Paper #:	USSC-16-278
Project #:	INVP 3915	Sanction Type:	Resanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	October 12, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Doneen Hobbs, SVP Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

This paper requests the resanction of INVP 3915 in the amount \$1.574M with a tolerance of +/- 10% for the purposes of Full implementation.

This sanction amount is \$1.574M broken down into:

\$1.267M Capex
\$0.307M Opex
\$0.000M Removal

Note the originally requested sanction amount of \$0.987M.

2 Resanction Details

2.1 Project Summary

This project provides mandatory annual changes (Federal and State) which must be applied to the Systems Applications Processing (SAP) core solution in order to properly reflect employee wages, employee and company withholdings, legal requirements and to comply with Federal and State regulatory reporting. SAP releases an annual support pack updates to the components for the Human Resources (HR) modules. Required updates include tax, payroll, legal and regulatory reporting changes and considerations required to produce year end employee wage statements (W2's), tax table changes for correctly processing payroll and required earnings withholdings, revised tax withholding tables, new annual maximum withholding requirements and all associated legal and regulatory compliance or reporting considerations for employee and company labor governmental reporting. The annual HR support packs contain updates for the close out of the current calendar year reporting cycle and for staging the requisite changes for the subsequent calendar year reporting cycle.



Resanction Request

2.2 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	1.574
Total		1.574

2.3 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Paper Reference Number	Tolerance
APR 2016	ISSC	\$0.987M	\$0.987M	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	Full	N/A	0%

Over / Under Expenditure Analysis

Summary Analysis (\$M)	Capex	Opex	Removal	Total
Resanction Amount	1.267	0.307	0.000	1.574
Latest Approval	0.000	0.987	0.000	0.987
Change*	1.267	-0.680	0.000	0.587

*Change = (Re-sanction – Amount Latest Approval)

2.4 Cost Summary Table

Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Current Planning Horizon						
					Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	Total
INVP 3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	+/- 10%	CapEx	0.000	1.267	0.000	0.000	0.000	0.000	0.000	1.267
			OpEx	0.000	0.307	0.000	0.000	0.000	0.000	0.000	0.307
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	1.574	0.000	0.000	0.000	0.000	0.000	1.574
Total Project Sanction			CapEx	0.000	1.267	0.000	0.000	0.000	0.000	0.000	1.267
			OpEx	0.000	0.307	0.000	0.000	0.000	0.000	0.000	0.307
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	1.574	0.000	0.000	0.000	0.000	0.000	1.574



Resanction Request

2.5 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
US IS Investment Plan, FY-16/17	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> N/A	0.587M

2.6 Drivers

2.6.1 Detailed Analysis Table

The following table indicates the major key variations that account for the difference between the original sanction amount and the requested resanction amount.

Detail Analysis	Over/Under Expenditure?	Amount (\$M)
T-Systems	<input checked="" type="checkbox"/> Over <input type="checkbox"/> Under	0.304
IS Project Management Resources	<input checked="" type="checkbox"/> Over <input type="checkbox"/> Under	0.283

2.6.2 Explanation of Key Variations

The original estimates were based on the previous year's implementation. Previously this project was implemented as part of the US Foundation Program (USFP) Stabilization and part of the cost structure was budgeted on the program level and was not allocated by project.

Based on the detailed review of associated costs \$0.680M OPEX will be underspent, and \$1.267M CAPEX is needed. Increase in costs are due to:

- Higher estimates (compared to prior years) from vendor partner who is doing this work.
- Inclusion of environment hosting fees (T-Systems) which in past years was absorbed by the USFP program.
- Accounting rule: ASC 350-40-30: Internal Use Software Measurement confirmed reclassifying development and test environment costs from OpEx to CapEx to capitalize on these expenses.



Resanction Request

2.7 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the Business Support Manager to meet jurisdictional budgetary, statutory and regulatory requirements.

2.8 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	MAR 2016
Begin Requirements and Design	MAY 2016
Full Sanction	APR 2016
Begin Development and Implementation	AUG 2016
Resanction	OCT 2016
Move to Production	DEC 2016
Project Complete	DEC 2016
Sanction Project Closure	MAR 2017

2.9 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
MAR 2017	Project Closure

Resanction Request

3 Statements of Support

3.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual's Name
Business Executive Sponsor	Doneen Hobbs
Head of BRM/Strategy	Jon Poor
Relationship Manager	Joel Semel
Program Delivery Manager	Samir Parikh
IS Finance Management	Chip Benson
IS Regulatory	Daniel DeMauro
DR&S	Elaine Wilson
Service Transition	Brian Detota
Enterprise Architecture	Henrik Magnusson

3.2 Reviewers

The reviewers have provided feedback on the content/language of the paper

Function	Individual	Area
Finance	Benson, Chip	All
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Patterson, James	Electric - NE
	Harbaugh, Mark	Electric - NY
	Hill, Terron	FERC
	Iseler, David G.	Gas - NE
	Brown, Laurie	Gas – NY
Procurement	Curran, Art	All



Resanction Request

4 Decisions

The US Sanctioning Committee (USSC) at a meeting held on October 12, 2016:

- (a) APPROVED this paper and the investment of \$1.574M and a tolerance of +/-10%.
- (b) NOTED that Samir Parikh has the approved financial delegation.

Signature.....Date.....

Christopher Kelly

Acting Senior Vice President, Electric Process & Engineering

US Sanctioning Committee Co – Chair Person

US Sanction Paper

Title:	Ancillary SAP Application Updates	Sanction Paper #:	USSC-16-206 v2
Project #:	INVP 4225	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	October 12, 2016
Author / NG Representative:	Diane Beard / Joseph Howard	Sponsor:	Doneen Hobbs, SVP Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4225 in the amount \$2.047M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$2.047M broken down into:

\$1.816M	Capex
\$0.231M	Opex
\$0.000M	Removal

1.2 Project Summary

This project is being undertaken to enable National Grid to achieve business objectives by upgrading applications to maintain vendor support. This includes component upgrades, improved usability, and improving the quality of production and non-production environments. This project will improve the stability of the applications and will align us with partner supported revisions for Sabrix, OpenText, and uPerform.

US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4225	SAP Ancillary Applications Upgrade	2.047
Total		2.047

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	1.574
3922	Access Violation (& Regulation) Management	4.300
4218	Blanket Work Order	6.891
4219	PowerPlan Upgrade	3.551
4223	BOE Update	1.543
4224	HANA Update	1.335
4226	ARIBA Releases Support	0.230
Total		19.424

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Tolerance
JUN 2016	USSC	\$0.304M	\$1.641M	Ancillary SAP Application Updates	Partial Sanction	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
MAR 2017	Closure

1.7 Category

Category	Reference to Mandate, Policy, or NPV Assumptions
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV	To improve the stability of the applications and will align us with partner supported revisions for Sabrix, OpenText, and uPerform.

US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 17

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 16

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan, FY-2016/17	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$1.822M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the IS Relationship Manager with the Planning Analyst assistance to meet jurisdictional budgetary, statutory and regulatory requirements.

US Sanction Paper

1.13 Current Planning Horizon

		Current Planning Horizon						
		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
	\$M		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
CapEx		0.000	1.816	0.000	0.000	0.000	0.000	0.000
OpEx		0.000	0.231	0.000	0.000	0.000	0.000	0.000
Removal		0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement		0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total		0.000	2.047	0.000	0.000	0.000	0.000	0.000
								Total
								1.816
								0.231
								0.000
								0.000
								0.000
								2.047

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	APR 2016
Begin Requirements and Design	MAY 2016
Partial Sanction	JUN 2016
Full Sanction	OCT 2016
Begin Development and Implementation	JUL 2016
Move to Production	DEC 2016
Project Complete	DEC 2016
Sanction Project Closure	MAR 2017

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A



US Sanction Paper

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

1	INVP 4225_AncSAP_TCO_12-Oct-2016_D_I_v2.xls
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US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on October 12, 2016:

- (a) APPROVED this paper and the investment of \$2.047M and a tolerance of +/- 10%.
- (b) APPROVED the RTB impact of \$0.001M (per annum) for 5 years.
- (c) NOTED that Samir Parikh has the approved financial delegation.

Signature.....Date.....

Christopher Kelly

Acting Senior Vice President, Electric Process & Engineering

US Sanctioning Committee Co – Chair Person

US Sanction Paper

3 Sanction Paper Detail

Title:	Ancillary SAP Application Updates	Sanction Paper #:	USSC-16-206 v2
Project #:	INVP 4225	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	October 12, 2016
Author / NG Representative:	Diane Beard / Joseph Howard	Sponsor:	Doneen Hobbs, SVP Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

3.1 Background

Sabrix Tax Determination – Sabrix tax determination is tax calculation software that is closely integrated with SAP Enterprise Central Component (ECC) system. Sabrix receives basic information from ECC and calculates the tax related attributes (use tax, sales tax, CCPS, goods movement etc.) and shares back the same with SAP. National Grid currently uses version 5.5.1 for Sabrix Tax determination which will run out of vendor support in June 2016. As part of FY17 portfolio of projects, Sabrix Tax determination is planned to be upgraded to version 5.8. The vendor support for Sabrix Tax Determination version 5.8 wil end January 2018.

Sabrix Reporting System – Sabrix Reporting system is the software component that leverages the tax data computed by Sabrix Tax determination software, and uses the same for tax reporting to authorities for National Grid. National Grid currently uses version 6.2 of the software which has run out of vendor support. As part of FY17 portfolio of projects, Sabrix Reporting system is planned to be upgraded to version 6.5. The vendor support for Sabrix Reporting system version 6.5 will end January 2018.

OpenText - The OpenText is the document management system used to save business data that cannot be saved in the SAP ECC system. This system helps alleviates any performance related issues with processing large objects. The system is also used to archive old data that's no longer necessary in the systems used by the business on a daily basis. This system integrates with SAP ECC, Supplier Relationship Management program (SRM) and the systems used to support transacting with these systems. National Grid currently uses OpenText version 9.7.1 and the software has run out of vendor support. As a part of the FY17 portfolio of projects, we are planning to upgrade the system to version 16. The vendor support for Open Text version 16 ends March 2021.

uPerform - Ancile uPerform is used by the National Grid Learning and Development team to build training documents for the end users. These training documents can be

US Sanction Paper

directly accessed from the SAP systems and this end-to-end connectivity is enabled by uPerform system. National Grid currently uses uPerform version 4.4 and the software has run out of support. As a part of the FY17 portfolio of projects, we are planning to upgrade the system to version 5.3. The vendor support for uPerform version 5.3 ends May 2020.

3.2 Drivers

The project is driven by National Grid's need to maintain reliability, stability, and maintain support from partners on ancillary applications such as uPerform, OpenText, and SABRIX. The following table represents the number of logged incidents from business users for each application due to the application not performing as expected. The On-line Service System (OSS) messages are critical issues that service providers couldn't resolve and had to escalate to SAP for resolution. The Incidents/Queries/SRs/Issues column represent incidents that our service provider were able to fix. The Upgrade Related/Recommendations column represent incidents that are no longer supported and cannot be fixed due to outdated software versions. While the seriousness of the issues is relatively minor, and with little impact to the business, it is still imperative that we continue to keep these systems current and upgraded in the event we encounter a more serious issue that impacts production.

(April 2015 to March 2016)			
System	OSS Messages	Incidents/Queries/SRs/Issues	Upgrade Related/Recommendations
Open Text	5	11	3
Sabrix	3	4	3
uPerform	13	4	2

3.3 Project Description

This project will upgrade SAP ancillary applications uPerform, OpenText, and SABRIX.

As part of Requirement & Design phase, following activities were completed for the Ancillary applications upgrade:

- As a first step, development environments will be built and prepared in line with the current production environments.
- The development environments will then be upgraded to target version.
- Analysis of the documentation released by the product vendors about the target version.
- Prepare/document the inventory of issues/functionality that requires to be fixed post upgrade of development systems.

US Sanction Paper

- Technical documentation of “how” the issues/functionality will be fixed.
- Preparation of Business Impact documentation.

During the Development and Implementation (D&I) phase of the project, the following will need to be accomplished:

- Technical Build
- System Testing
- Integration Testing
- Regression Testing
- User Acceptance Testing
- Implementation

3.4 Benefits Summary

The main benefits of the project are:

- Keeping business critical application in support agreement with the vendor.
- Mitigate risk due to being out of support.

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Reject the Project

This is not a viable solution because failure to address the ancillary applications (uPerform, OpenText, and SABRIX) can have a negative impact with vendor support for these programs and incompatibility with SAP deployed solutions.

Alternative 2: Defer the Project

The vendor support has run out on all of the applications, deferring the project would have the same impact as rejecting. There is not only an application functionality gap, but also a technology gap that exists when delaying the upgrade process. There is currently a backlog of aging incidents that would continue to grow. Upgrades are necessary since the business must be able to continue on a stable and well-performing business system.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

US Sanction Paper

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk
			Cost	Schedule	Cost	Schedule			
1	Development (DEV) and/or testing (QA) environment may not be available at the required time due to commercial or operational constraints with our hosting provider.	4	4	4	16	16	Accept	SAP PDM and PM will work with hosting provider to prioritize delivery dates of most critical environments first. We will also escalate to IS Commercial as necessary any risks or issues we foresee. PCRs will also be submitted as far in advance as possible once environment timeline requirements are finalized.	The cost and timeline of the project may be impacted.
5	Vendor availability (Thomson Reuters and ANCILE) is not aligned with environment delivery from T-Systems.	3	3	5	9	15	Mitigate	Wipro will continue to engage the vendors and provide advanced notices of environment delivery schedules.	Key technical resources availability and support during upgrades

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

3.10.3 CIAC / Reimbursement

N/A

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Current Planning Horizon							Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +		
INVP 4225	SAP Ancillary Applications Upgrade	+/- 10%	CapEx	0.000	1.816	0.000	0.000	0.000	0.000	0.000	0.000	1.816
			OpEx	0.000	0.231	0.000	0.000	0.000	0.000	0.000	0.231	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	2.047	0.000	0.000	0.000	0.000	0.000	2.047	
Total Project Sanction			CapEx	0.000	1.816	0.000	0.000	0.000	0.000	0.000	1.816	
			OpEx	0.000	0.231	0.000	0.000	0.000	0.000	0.000	0.231	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	2.047	0.000	0.000	0.000	0.000	0.000	2.047	

US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.225	0.000	0.000	0.000	0.000	0.000	0.225
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.225	0.000	0.000	0.000	0.000	0.000	0.225

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	
CapEx	0.000	(1.816)	0.000	0.000	0.000	0.000	0.000	(1.816)
OpEx	0.000	(0.006)	0.000	0.000	0.000	0.000	0.000	(0.006)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(1.822)	0.000	0.000	0.000	0.000	0.000	(1.822)

3.11.3 Cost Assumptions

This estimate was developed in 2016 using the standard IS estimating methodology. The accuracy level of estimate for each project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.5 Additional Impacts

None

US Sanction Paper

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual's Name
Business Executive Sponsor	Vivienne Bracken
Business Client Lead	William Donoghue
Head of BRM/Strategy	Jon Poor
Head of PDM	Sally Seltzer
Relationship Manager	Joel Semel
Program Delivery Manager	Samir Parikh
IS Finance Management	Chip Benson
IS Regulatory	Daniel DeMauro
DR&S	Elaine Wilson
Service Delivery	Brian Detota
Enterprise Architecture	Henrik Magnusson

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual	Area
Finance	Benson, Chip	All
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Patterson, James	Electric - NE
	Harbaugh, Mark	Electric - NY
	Hill, Terron	FERC
	Iseler, David G.	Gas - NE
	Brown, Laurie	Gas - NY
Procurement	Curran, Art	All

US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Other Appendices

4.2.1 Project Cost Breakdown:

Project Cost Breakdown			
Cost Category	sub-category	\$ (millions)	Name of Firm(s) providing
Personnel	NG Resources	0.255	
	SDC Time & Materials	0.009	
	SDC Fixed-Price	0.850	Wipro
	All other personnel	0.100	Thomson Reuters
	TOTAL Personnel Costs	1.214	
Hardware	Purchase	-	
	Lease	0.422	T-Systems
Software		-	
Risk Margin		0.360	
Other		0.051	
TOTAL Costs		2.047	

US Sanction Paper

4.2.2 Benefiting Operating Companies:

Benefiting Operating Companies Table:

The requested budget will be allocated to all companies.

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp. - Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent Company	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA,NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc. Service Company	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp. Service Company	Service Company	
New England Electric Trans Corp	Inter Connector	MA

US Sanction Paper

4.2.3 IS Ongoing Operational Costs (RTB):

This project will increase IS ongoing operations support costs as per the following table. These are also known as Run the Business (RTB) costs.

Summary Analysis of RTB Costs							
All figures in \$ millions	Yr. 1 16/17	Yr. 2 17/18	Yr. 3 18/19	Yr. 4 19/20	Yr. 5 20/21	Yr. 6+	Total
<u>Forecast of RTB Impact</u>							
RTB if Status Quo Continues	-	-	-	-	-	-	-
RTB if Project is Implemented	0.000	0.001	0.001	0.001	0.001	0.001	0.006
Net change in RTB	0.000	0.001	0.001	0.001	0.001	0.001	0.006
<u>RTB Variance Analysis</u> (if Project is Implemented)							
Net Δ RTB funded by Plan(s)	-	-	-	-	-	-	-
Variance to Plan	0.000	0.001	0.001	0.001	0.001	0.001	0.006
<u>Total RTB Costs - by Cost Type</u> (if Project is Implemented)							
App.Sup. - SDC 1	-	-	-	-	-	-	-
App.Sup. - SDC 2	-	-	-	-	-	-	-
App.Sup. - other	-	-	-	-	-	-	-
SW maintenance	0.000	0.001	0.001	0.001	0.001	0.001	0.006
SaaS	-	-	-	-	-	-	-
HW support	-	-	-	-	-	-	-
Other: IS	-	-	-	-	-	-	-
All IS-related RTB (sub-Total)	0.000	0.001	0.001	0.001	0.001	0.001	0.006
Business Support (sub-Total)	-	-	-	-	-	-	-
Total RTB Costs	0.000	0.001	0.001	0.001	0.001	0.001	0.006



US Sanction Paper

Title:	US SAP Annual HANA Update	Sanction Paper #:	USSC-16-205 v2
Project #:	INVP 4224	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	August 10, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Doneen Hobbs, VP US Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4224 in the amount \$1.335M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$1.335M broken down into:

\$0.696M	Capex
\$0.639M	Opex
\$0.000M	Removal

1.2 Project Summary

This project is designed to ensure the quality of Systems, Applications, Products (SAP) family of services, including upgrades of different components. This project will support the annual update of High performance Analytic Appliance (HANA) environment. The HANA environment is used for Business Intelligence reporting as well as for the acceleration of several core SAP processes. HANA is currently used by several areas within National Grid including Finance, Global Procurement, Inventory/Warehouse Management, Fleet, Human Resources (HR), Payroll Operations, and Gas and Electric Operations.



US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4224	US SAP Annual HANA Update	1.335
Total		1.335

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	1.574
3922	Access Violation (& Regulation) Management	4.300
4218	Blanket Work Order	6.891
4219	PowerPlan Upgrade	3.551
4223	BOE Update	1.543
4225	Ancillary SAP App Update	2.047
4226	ARIBA Releases Support	0.230
Total		20.136

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Tolerance
JUN 2016	USSC	\$0.260M	\$1.606M	US SAP Annual HANA Update	Partial Sanction	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
Feb 2017	Project Closure

1.7 Category

Category	Reference to Mandate, Policy, or NPV Assumptions
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV	To support the asset health of National Grid application and keep business critical application within supported version.



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 22

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 15

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan, FY-2016/17	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$1.110M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the IS Relationship Manager with the Planning Analyst assistance to meet jurisdictional budgetary, statutory and regulatory requirements.



US Sanction Paper

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx	0.000	0.696	0.000	0.000	0.000	0.000	0.000	0.696
OpEx	0.000	0.639	0.000	0.000	0.000	0.000	0.000	0.639
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	1.335	0.000	0.000	0.000	0.000	0.000	1.335

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	APR 2016
Begin Requirements and Design	MAY 2016
Partial Sanction	JUN 2016
Begin Development and Implementation	JUL 2016
Full Sanction	AUG 2016
Move to Production	NOV 2016
Project Complete	NOV 2016
Sanction Project Closure	FEB 2017

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green



US Sanction Paper

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

1	INVP 4224_HANA_TCO_10-Aug-2016_D_I_v1.xls
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US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on August 10, 2016:

(a) APPROVED this paper and the investment of \$1.335M and a tolerance of +/- 10%.

(b) NOTED that Samir Parikh has the approved financial delegation.

Signature..........Date.....

Christopher Kelly

Acting Senior Vice President US Sanctioning Committee Co - Chair Person



US Sanction Paper

3 Sanction Paper Detail

Title:	US SAP Annual HANA Update	Sanction Paper #:	USSC-16-205 v2
Project #:	INVP 4224	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	August 10, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Doneen Hobbs, VP US Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

3.1 **Background**

HANA is an SAP proprietary in-memory platform used by National Grid for Business Intelligence reporting as well as the acceleration of many core SAP processes. HANA plays a critical part in accelerating the financial period close process and is currently relied on by Finance for all self-service reporting needs. HANA is also used for Productivity and Labor unit cost metrics as well as Inventory Management, Timesheet and Payroll reporting. (HANA acts as the data repository and performs complex calculations and data transformations before sending the resulting data to Business Objects for presentation and end user consumption. A typical user who wants to pull data from HANA will interact with the Business Objects system only and not with HANA itself.)

The National Grid HANA Platform is currently on version 82, which was released by SAP in May of 2014. HANA is a stable but relatively new technology and SAP is committed to a schedule of releasing 2 new service pack upgrades each calendar year. The service packs are intended to correct known issues, increase performance and introduce new functionality and enhancements. SAP has acknowledged limitations to the 82 release and has advised that the only method to remediate the issues is to conduct a system upgrade.

The HANA upgrade project will bring us to the latest stable support pack and correct several known stability and performance issues. In addition, several of the enhancements are required for capacity planning and continued growth of the environment.

3.2 **Drivers**

The drivers for this project are:



US Sanction Paper

- The need to keep the application in support
- The need to provide stability and alleviate performance concerns experienced in the current production environment. These known issues pose a risk to our financial period close processing and can only be fixed by upgrading the system.

3.3 Project Description

This project will support the annual update of High performance Analytic Appliance (HANA) environment.

During the Requirements and Design (R&D) phase of the project, the following has been accomplished:

- Baseline the detailed business and technical requirements
- Design the testing strategy
- Define the training strategy

During the Development and Implementation (D&I) phase of the project, the following will need to be accomplished:

- Technical Build
- System Testing
- Integration Testing
- Regression Testing
- User Acceptance Testing
- Implementation

3.4 Benefits Summary

The main benefits of the project are:

- Keeping business critical application in support agreement with the vendor
- Applying fixes to existing stability and data replication issues
- Benefiting from the major enhancements and new added capabilities including (but not limited to)
 - Enhanced memory management capabilities to boost performance
 - Enhancements in capacity planning that will allow the system to accommodate organic data growth without additional in-memory capacity
 - Ability to federate data from non SAP source systems to facilitate cross functional reporting, without additional in-memory capacity

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

US Sanction Paper

3.6 Alternatives

Alternative 1: Defer Project / Do Nothing

This is not a viable option due to the criticality of the system and the stability risks that we are experiencing in the current production environment.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk
			Cost	Schedule	Cost	Schedule			
1	The testing (QA) environment may not be available at the required time due to commercial or operational constraints with our hosting provider.	4	4	4	16	16	Accept	SAP PDM and PM will work with hosting provider to prioritize delivery dates of most critical environments first. We will also escalate to IS Commercial as necessary any risks or issues we foresee. PCRs will also be submitted as far in advance as possible once environment timeline requirements are finalized.	The cost and timeline of the project may be impacted.

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A



US Sanction Paper

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

					Current Planning Horizon						
Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	Total
INVP 4224	US SAP Annual HANA Update	+/- 10%	CapEx	0.000	0.696	0.000	0.000	0.000	0.000	0.000	0.696
			OpEx	0.000	0.639	0.000	0.000	0.000	0.000	0.639	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	1.335	0.000	0.000	0.000	0.000	0.000	1.335
Total Project Sanction			CapEx	0.000	0.696	0.000	0.000	0.000	0.000	0.000	0.696
			OpEx	0.000	0.639	0.000	0.000	0.000	0.000	0.000	0.639
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	1.335	0.000	0.000	0.000	0.000	0.000	1.335

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

		Current Planning Horizon						
		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M	(Actual)	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.225	0.000	0.000	0.000	0.000	0.000	0.225
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.225	0.000	0.000	0.000	0.000	0.000	0.225

Variance (Business Plan-Project Estimate)

		Current Planning Horizon						
	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M	(Actual)	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
CapEx	0.000	(0.696)	0.000	0.000	0.000	0.000	0.000	(0.696)
OpEx	0.000	(0.414)	0.000	0.000	0.000	0.000	0.000	(0.414)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(1.110)	0.000	0.000	0.000	0.000	0.000	(1.110)

3.11.3 Cost Assumptions

This estimate was developed in 2016 using the standard IS estimating methodology. The accuracy level of estimate for each project is identified in table 3.11.1.

US Sanction Paper

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.5 Additional Impacts

None

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual's Name
Business Executive Sponsor	Doneen Hobbs
Business Client Lead	Bonnie Burkhardt
Head of BRM/Strategy	Jon Poor
Head of PDM	Jeffrey Dailey obo Don Stahlin
Relationship Manager	Joel Semel
Program Delivery Manager	Samir Parikh
IS Finance Management	Chip Benson
IS Regulatory	Daniel DeMauro
DR&S	Mukund Ravipaty
Service Delivery	Brian Detota
Enterprise Architecture	Henrik Magnusson

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual	Area
Finance	Benson, Chip	All
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Patterson, James	Electric -NE
	Harbaugh, Mark	Electric - NY
	Hill, Terron	FERC
	Iseler, David G.	Gas - NE
	Brown, Laurie	Gas - NY
Procurement	Curran, Art	All



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Other Appendices

4.2.1 Project Cost Breakdown:

Project Cost Breakdown			
Cost Category	sub-category	\$ (millions)	Name of Firm(s) providing
Personnel	NG Resources	0.209	
	SDC Time & Materials	0.009	IBM
	SDC Fixed-Price	0.444	Wipro
	All other personnel	0.011	
	TOTAL Personnel Costs	0.673	
Hardware	Purchase	-	
	Lease	0.511	T-Systems, SAP HEC
Software		-	
Risk Margin		0.121	
Other		0.029	
TOTAL Costs		1.335	

696

4.2.2 Benefiting Operating Companies:

This investment will benefit the following companies:

Benefiting Operating Companies	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. – Transmission	Transmission	NY
Niagara Mohawk Power Corp. – Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT



US Sanction Paper

KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA, NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc.	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp.	Service Company	
New England Electric Trans Corp	Inter Connector	MA



US Sanction Paper

Title:	US SAP Annual Business Objects Environment (BOE) Update	Sanction Paper #:	USSC-16-204 v2
Project #:	INVP 4223	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	August 10, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Doneen Hobbs, VP US Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4223 in the amount \$1.543M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$1.543M broken down into:

\$0.742M	Capex
\$0.801M	Opex
\$0.000M	Removal

1.2 Project Summary

This project is designed to ensure the quality of Systems, Applications, Products (SAP) family of services, including upgrades of different components. This project will support the annual update of the Business Objects reporting environments. All US Foundation Program (USFP) Business Intelligence reporting is conducted through the Business Objects platform and suite of end user reporting tools. Business Objects is currently used by several areas within National Grid including Finance, Global Procurement, Accounts Payable, Inventory/Warehouse Management, Fleet, Human Resources (HR), Payroll Operations, Non-Utility Billing, and Gas and Electric Operations.



US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4223	US SAP Annual Business Objects Environment (BOE) Update	1.543
Total		1.543

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	1.574
3922	Access Violation (& Regulation) Management	4.300
4218	Blanket Work Order	6.891
4219	PowerPlan Upgrade	3.551
4224	HANA Update	1.335
4225	Ancillary SAP App Update	2.047
4226	ARIBA Releases Support	0.230
Total		19.928

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Paper Title	Sanction Type	Tolerance
JUN 2016	USSC	\$0.344M	\$1.868M	US SAP Annual Business Objects Environment (BOE) Update	Partial Sanction	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
Mar 2017	Closure

1.7 Category

Category	Reference to Mandate, Policy, or NPV Assumptions
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV	This project is being funded to support the asset health of National Grid application and keep business critical application within supported version.



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 22

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 15

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan, FY-2016/17	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$1.318M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the IS Relationship Manager with the Planning Analyst assistance to meet jurisdictional budgetary, statutory and regulatory requirements.



US Sanction Paper

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx	0.000	0.742	0.000	0.000	0.000	0.000	0.000	0.742
OpEx	0.000	0.801	0.000	0.000	0.000	0.000	0.000	0.801
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	1.543	0.000	0.000	0.000	0.000	0.000	1.543

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	APR 2016
Begin Requirements and Design	MAY 2016
Partial Sanction	JUN 2016
Begin Development and Implementation	JUL 2016
Full Sanction	AUG 2016
Move to Production	NOV 2016
Project Complete	DEC 2016
Sanction Project Closure	MAR 2017

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

N/A



US Sanction Paper

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

1	INVP 4223 BOE TCO 10-Aug-2016 D I v1.xls
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US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on August 10, 2016:

- (a) APPROVED this paper and the investment of \$1.543M and a tolerance of +/- 10%.
- (b) NOTED that Samir Parikh has the approved financial delegation.

Signature..........Date.....

Christopher Kelly

Acting Senior Vice President US Sanctioning Committee Co - Chair Person



US Sanction Paper

3 Sanction Paper Detail

Title:	US SAP Annual Business Objects Environment (BOE) Update	Sanction Paper #:	USSC-16-204 v2
Project #:	INVP 4223	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	August 10, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Doneen Hobbs, VP US Shared Services
Utility Service:	IS	Project Manager:	Samir Parikh

3.1 **Background**

Business Objects is the SAP solution for Business Intelligence (BI) and Analytics. All National Grid USFP BI reporting is done through the Business Objects platform and suite of end user reporting tools. Business Objects is relied on by Finance, Supply Chain Management, HR, and Operations to support their reporting requirements.

National Grid currently has two instances of Business Objects running at different versions. The Business Objects system used for traditional SAP Business Information Warehouse (BW) reporting is hosted with T-Systems and is on version 4.0. There is also a Business Objects system running on top of the High performance Analytic Appliance (HANA) system hosted with HANA Enterprise Cloud (HEC) and is on version 4.1. Business Objects 4.0 is a critical platform and has reached the end of mainstream maintenance, which means we are only entitled to limited support from SAP. SAP has acknowledged limitations to the 4.0 and 4.1 products and has advised that the only method to remediate the issues is to conduct a system upgrade.

The Business Objects upgrade project will standardize both environments to the latest stable and supported version of the product. The upgrade will correct many known issues, provide additional functionality, and introduce performance improvements.

3.2 **Drivers**

The drivers for this project are:

- The need to keep the application current and in support with SAP.
- The ability to standardize versions across Business Objects reporting environments to help facilitate eventual consolidation.
- Fix known issues impacting end user reporting
- Deliver additional features and functionality



US Sanction Paper

3.3 Project Description

This project will support the annual update of the Business Objects reporting environments.

As part of the Requirements and Design (R&D) phase of the project, the following was accomplished:

- Baseline the detailed business and technical requirements
- Design the testing strategy
- Define the training strategy

During the Development and Implementation (D&I) phase of the project, the following will need to be accomplished:

- Technical Build
- System Testing
- Integration Testing
- Regression Testing
- User Acceptance Testing
- Implementation

3.4 Benefits Summary

The main benefits of the project are:

- Keeping business critical application in support agreement with the vendor
- Applying fixes to the existing issues
- Benefiting from the major enhancements and new added capabilities. including (but not limited to)
 - Performance enhancements with the introduction of parallel query execution
 - Simplified connectivity options with the HANA environment
 - Updates to Web Intelligence tool used for Self Service reporting
 - Enhancements made to administration and monitoring capabilities

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.



US Sanction Paper

3.6 Alternatives

Alternative 1: Defer Project / Do Nothing

This is not a viable option due to the requirement to keep the application in full support with SAP.

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk
			Cost	Schedule	Cost	Schedule			
1	The testing (QA) environment may not be available at the required time due to commercial or operational constraints with our hosting provider.	4	4	4	16	16	Accept	SAP PDM and PM will work with hosting provider to prioritize delivery dates of most critical environments first. We will also escalate to IS Commercial as necessary any risks or issues we foresee. PCRs will also be submitted as far in advance as possible once environment timeline requirements are finalized.	The cost and timeline of the project may be impacted.

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

N/A

3.10.3 CIAC / Reimbursement

N/A



US Sanction Paper

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

					Current Planning Horizon						
Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
INVP 4223	US SAP Annual Business Objects Environment (BOE) Update	+/- 10%	CapEx	0.000	0.742	0.000	0.000	0.000	0.000	0.000	0.742
			OpEx	0.000	0.801	0.000	0.000	0.000	0.000	0.801	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	1.543	0.000	0.000	0.000	0.000	0.000	1.543
Total Project Sanction			CapEx	0.000	0.742	0.000	0.000	0.000	0.000	0.000	0.742
			OpEx	0.000	0.801	0.000	0.000	0.000	0.000	0.000	0.801
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	1.543	0.000	0.000	0.000	0.000	0.000	1.543

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

		Current Planning Horizon						
		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +
\$M	(Actual)	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.225	0.000	0.000	0.000	0.000	0.000	0.225
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.225	0.000	0.000	0.000	0.000	0.000	0.225

Variance (Business Plan-Project Estimate)

		Current Planning Horizon						
	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M	(Actual)	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
CapEx	0.000	(0.742)	0.000	0.000	0.000	0.000	0.000	(0.742)
OpEx	0.000	(0.576)	0.000	0.000	0.000	0.000	0.000	(0.576)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(1.318)	0.000	0.000	0.000	0.000	0.000	(1.318)

3.11.3 Cost Assumptions

This estimate was developed in 2016 using the standard IS estimating methodology. The accuracy level of estimate for each project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.



US Sanction Paper

Title:	PowerPlan Upgrade	Sanction Paper #:	USSC-16-203
Project #:	INVP 4219	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	June 8, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	David Campbell, VP US Corporate Finance
Utility Service:	IS	Project Manager:	Samir Parikh

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests partial sanction of INVP 4219 in the amount \$1.242M with a tolerance of +/- 10% for the purposes of Requirements and Design.

This sanction amount is \$1.242M broken down into:

\$0.806M	Capex
\$0.436M	Opex
\$0.000M	Removal

NOTE the potential investment of \$3.426M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of Requirements and Design.

1.2 **Project Summary**

This policy-driven project to the PowerPlan application. This project will upgrade the application to the current version (2015.2). Without the upgrade, PowerPlan will go out of support which will impose high risk for a National Grid mission critical system.



US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4219	PowerPlan Upgrade	3.426
Total		3.426

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3922	Access Violation (& Regulation) Management	4.707
3915	Annual HR & Payroll Mandatory Service Pack Upgrade (HRSP)	0.987
4218	Blanket Work Order	6.791
4223	BOE Update	1.868
4224	HANA Update	1.606
4225	Ancillary SAP App Update	1.641
4226	ARIBA Releases Support	0.225
Total		17.825

1.5 Prior Sanctioning History

N/A

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
JUL 2016	Development and Implementation (D&I) Sanction

1.7 Category

Category	Reference to Mandate, Policy, or NPV Assumptions
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV	To support the asset health of National Grid application and keep business critical application within supported version.

1.8 Asset Management Risk Score

Asset Management Risk Score: 41



US Sanction Paper

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

1.9 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 18

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
IS Investment Plan, FY-2016/17	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$2.346M

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by the IS Relationship Manager with the Planning Analyst assistance to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6+ 2021/22	
CapEx	0.000	2.586	0.000	0.000	0.000	0.000	0.000	2.586
OpEx	0.000	0.840	0.000	0.000	0.000	0.000	0.000	0.840
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CIAC/Reimbursement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	3.426	0.000	0.000	0.000	0.000	0.000	3.426

US Sanction Paper

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	APR 2016
Begin Requirements and Design	MAY 2016
Sanction Requirements and Design	JUN 2016
Sanction Development and Implementation	JUL 2016
Begin Development and Implementation	JUL 2016
Move to Production	NOV 2016
Project Complete	NOV 2016
Sanction Project Closure	FEB 2017

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Construction/Implementation Resources to be provided	<input checked="" type="checkbox"/> Internal	<input checked="" type="checkbox"/> Contractor	
Resource Delivery			
Availability of internal resources to deliver project:	<input type="radio"/> Red	<input checked="" type="radio"/> Amber	<input type="radio"/> Green
Availability of external resources to deliver project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Operational Impact			
Outage impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Procurement Impact			
Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green

1.16 Key Issues (include mitigation of Red or Amber Resources)

1	Availiability of internal resources who support other initiatives is a known risk and is being mitigated by prioritizing their workload and obtaining support from business project sponsors/leadership.
2	



US Sanction Paper

1.17 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

1.18 List References

1	INVP 4219_TCO_8-Jun-2016_rd_v1.xls
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US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on June 8, 2016:

- (a) APPROVED the investment of \$1.242M and a tolerance of +/- 10% for the purposes of requirements and design.
- (b) NOTED the potential RTB Impact of \$0.000M (per annum) for 5 years.
- (c) NOTED the potential investment of \$3.426M and a tolerance of +/-25% contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design.
- (d) NOTED that Samir Parikh has the approved financial delegation to undertake the activities stated in (a).

Signature..... *Ch Kelly* Date..... *6/12/16*

Christopher Kelly

Senior Vice President US Sanctioning Committee Co - Chair Person



US Sanction Paper

3 Sanction Paper Detail

Title:	PowerPlan Upgrade	Sanction Paper #:	USSC-16-203
Project #:	INVP 4219	Sanction Type:	Partial Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	June 8, 2016
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	David Campbell, VP US Corporate Finance
Utility Service:	IS	Project Manager:	Samir Parikh

3.1 **Background**

National Grid uses the PowerPlan family of applications to perform many functions related to tracking the capitalization of work order costs (over \$2 billion of annual CAPEX spend) construction, retirement and fixed asset (property) maintainance as the sub-ledger of the Company's Work in Progress and Fixed Asset repository records.

The Fixed Asset sub-ledger is used to maintain the depreciation and property tax basis (over \$28 Billion in net utility plant assets maintained) of assets which each generate over \$700 million dollars in expenses annually. The application is used to balance financial constraints, risk tolerance and performance obligations with regulatory requirements. Controlling fixed assets records allows National Grid to avoid compromises and provide an opportunity to improve cash flow and overall financial performance.

The National Grid PowerPlan application is currently using version 10 which will go out of support in June 2016. National Grid currently has Premier Support Model for PowerPlan application. Trending shows there are multiple tickets per week that require continued remediation support. The agreement was reached with the vendor that if the company begins the upgrade in June, the vendor will continue the support of the outdated version until the implementation is complete.

Additionally, the upgrade will bring in all fixes and application improvements which will allow National Grid to improve the performance and stability of the system and ensure that all of the latest regulatory changes are applied.

3.2 **Drivers**

The project is driven by National Grid's need to incorporate the latest regulatory updates and the need to keep the application in support.

US Sanction Paper

3.3 Project Description

This project will upgrade the PowerPlan application to the current version (2015.2).

During the Requirements and Design (R&D) phase of the project, the following will need to be accomplished:

- Baseline the detailed business and technical requirements
- Design the testing strategy
- Define the training strategy

During the Development and Implementation (D&I) phase of the project, the following will need to be accomplished:

- Technical build and system configuration based on Business Requirements and Design
- System Testing
- Integration Testing
- Regression Testing
- User Acceptance Testing
- Implementation

3.4 Benefits Summary

The main benefits of the project are:

- Keeping business critical application in support agreement with the vendor
- Keeping National Grid in compliance with all federal, state and local regulations
- Major enhancements and newly added capabilities including (but not limited to)
 - streamlined process for creating asset retirements entries on work orders
 - additional functionality for Regulatory Existing Asset Layers

3.5 Business and Customer Issues

There are no significant business issues beyond what has been described elsewhere.

3.6 Alternatives

Alternative 1: Defer Project / Do Nothing

This is not a viable option because National Grid has to have a supported version of the PowerPlan family of application.

US Sanction Paper

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described elsewhere.

3.8 Execution Risk Appraisal

Number	Detailed Description of Risk / Opportunity	Probability	Impact		Score		Strategy	Pre-Trigger Mitigation Plan	Residual Risk	Post Trigger Mitigation Plan
			Cost	Schedule	Cost	Schedule				
2	Availability of business resources to support a full regression test.	3	3	3	9	9	Mitigate	Prioritize the business resources workload and obtain support from business project sponsors/leadership.		
5	Prompt response from DBAs and other critical IT Infrastructure support teams is often a challenge.	4	4	4	16	16	Mitigate	Ensure that all parties understand the schedules, service level agreements, and make effective use of appropriate communication channels.		
6	Conflicting demands on Infrastructure.	2	3	3	6	6	Mitigate	Company initiatives to upgrade or change Infrastructure components can be disruptive to PowerPlan development and test phases. PowerPlan should maintain open lines of communication with the IT Infrastructure Support team to be apprised of any such developments.		
7	PowerBuilder access for the PowerPlan development team.	3	3	4	9	12	Mitigate	Access to client-purchased PowerBuilder licenses often cause delays to the Build phase. Client support personnel must order and implement PowerBuilder licenses well in advance of the Build phase.		

3.9 Permitting

N/A

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery will occur at the time of the next rate case for any operating company receiving allocations of these costs.

3.10.2 Customer Impact

3.10.3 CIAC / Reimbursement

N/A



US Sanction Paper

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
INVP 4219	PowerPlan Upgrade	+/- 10%	CapEx	0.000	2.586	0.000	0.000	0.000	0.000	0.000	2.586
			OpEx	0.000	0.840	0.000	0.000	0.000	0.000	0.840	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	3.426	0.000	0.000	0.000	0.000	3.426	
Total Project Sanction			CapEx	0.000	2.586	0.000	0.000	0.000	0.000	0.000	2.586
			OpEx	0.000	0.840	0.000	0.000	0.000	0.000	0.840	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.000	3.426	0.000	0.000	0.000	0.000	3.426	

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	1.080	0.000	0.000	0.000	0.000	0.000	1.080
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	1.080	0.000	0.000	0.000	0.000	0.000	1.080

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1 2016/17	Yr. 2 2017/18	Yr. 3 2018/19	Yr. 4 2019/20	Yr. 5 2020/21	Yr. 6 + 2021/22	
CapEx	0.000	(2.586)	0.000	0.000	0.000	0.000	0.000	(2.586)
OpEx	0.000	0.240	0.000	0.000	0.000	0.000	0.000	0.240
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(2.346)	0.000	0.000	0.000	0.000	0.000	(2.346)

3.11.3 Cost Assumptions

This estimate was developed in 2016 using the standard IS estimating methodology. The accuracy level of estimate for each project is identified in table 3.11.1.

US Sanction Paper

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.5 Additional Impacts

None

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Individual's Name
Business Executive Sponsor	Peggy Smyth
Business Client Lead	William Donoghue
Head of BRM/Strategy	Jon Poor
Head of PDM	Jeffrey Dailey
Relationship Manager	Joel Semel
Program Delivery Manager	Samir Parikh
IS Finance Management	Chip Benson
IS Regulatory	Daniel DeMauro
DR&S	Mukund Ravipaty
Service Transition	Brian Detota
Enterprise Architecture	Henrik Magnusson

US Sanction Paper

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual	Area
Finance	Benson, Chip	All
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Patterson, James	New England – Electric
	Harbaugh, Mark	New York – Electric
	Hill, Terron	FERC
	Brown, Laurie	Gas – NY
	Iseler, David G.	Gas – NE
Procurement	Art Curran	All

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Other Appendices

4.2.1 Project Cost Breakdown:

Project Cost Breakdown			
Cost Category	sub-category	\$ (millions)	Name of Firm(s) providing
Personnel	NG Resources	0.100	
	SDC Time & Materials	0.006	
	SDC Fixed-Price	0.623	IBM, Wipro
	All other personnel	1.602	PowerPlan
	TOTAL Personnel Costs	2.332	
Hardware	Purchase	-	
	Lease	0.440	T-Systems
Software		-	
Risk Margin		0.539	
Other		0.115	
TOTAL Costs		3.426	



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4.2.2 Benefiting Operating Companies:

Benefiting Operating Companies Table:

The requested budget will be allocated to all companies.

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp.- Electric Distr.	Electric Distribution	NY
Massachusetts Electric Company	Electric Distribution	MA
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Narragansett Electric Company	Electric Distribution	RI
Niagara Mohawk Power Corp. - Transmission	Transmission	NY
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
New England Power Company – Transmission	Transmission	MA, NH, RI, VT
KeySpan Generation LLC (PSA)	Generation	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA
Narragansett Electric Company – Transmission	Transmission	RI
National Grid USA Parent	Parent Company	
Nantucket Electric Company	Electric Distribution	MA
NE Hydro - Trans Electric Co.	Inter Connector	MA,NH
KeySpan Energy Development Corporation	Non-Regulated	NY
KeySpan Port Jefferson Energy Center	Generation	NY
New England Hydro - Trans Corp.	Inter Connector	MA, NH
KeySpan Services Inc. Service Company	Service Company	
KeySpan Glenwood Energy Center	Generation	NY
Massachusetts Electric Company – Transmission	Transmission	MA
NG LNG LP Regulated Entity	Gas Distribution	MA, NY, RI
Transgas Inc	Non-Regulated	NY
Keyspan Energy Trading Services	Other	NY
KeySpan Energy Corp. Service Company	Service Company	
New England Electric Trans Corp	Inter Connector	MA

Division 12-12

Request:

Referring to DIV 9-4 and DIV 12-11, are there any costs related to the USFP SAP implementation problems and subsequent corrective stabilization efforts among the projects identified? If yes, please identify the Service Company Rent expenses allocated to Narragansett Electric Company for these costs.

Response:

The Company is not seeking recovery of any stabilization costs. These costs were charged to National Grid USA, not to customers; therefore, they are not included in the cost of service in this proceeding.