



Long: US Sanction Paper

Title:	Document Management Systems Replacement-Delivery	Sanction Paper #:	USSC-16-297 V4
Project #:	INVP 4408	Sanction Type:	Sanction
Capex #:	S007549		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	6/12/2019
Author:	Kastler, John F.	Sponsor:	Turrini, Ross W. Snr VP GP&E & Chief Gas Eng
Utility Service:	IT	Project Manager:	Kastler, John F.

Executive Summary

This paper requests Sanction of INVP 4408 in the amount of \$14.273M with a tolerance of +/-10% for the purposes of Full Implementation.

This sanction amount is \$14.273M broken down into:

- \$11.979M Capex
- \$2.294M Opex
- \$0.000M Removal

Project Summary

This investment will deploy the OpenText Document Management System for the gas and electric engineering business groups included in Waves 2 and 3. Wave 1 was deployed on April 5th. The investment will cover primarily labor costs as the bulk of the software and infrastructure were implemented with Wave 1.

Background

The Document Management Systems used to store, retrieve, and update electric, gas and power plant engineering drawings and documents at National Grid are beyond their useful lifespan and are creating an unacceptable level of risk to the Company. Inability to retrieve electric, gas and power plant system information and mapping could lead to non-compliance with legal obligations for document storage, and programs including "Dig-Safe", leading to risk of accidental system damage. The applications have not been upgraded since their deployment and are now unsupported due to their aging computing technology and software. The downstate TeamCenter application includes some components that have shut down and will no longer function properly. The Documentum desktop versions 5.3 and 6.0 are no longer supported by the vendor and are not compatible with the Windows 7 operating system. TeamCenter is also not compatible with Windows 7. As a result, some business units have not been able to upgrade to the Windows 7 environment and are still working on the Windows XP operating system. Some areas are using the web version of Documentum which is cumbersome, slow, and impacting operational effectiveness. Continued use of the XP operating system presents a significant cyber security risk.

During the first half of 2016, National Grid conducted a study of five vendors to identify a suitable application for the replacement of the current Document Management Systems. This investment will provide funding for the purchase and deployment of the preferred application from the commercial Request For Proposal (RFP)

event. By investing in a new Document Management System, National Grid will reduce or eliminate risks associated to the current document storage methodologies in use by the electric, gas and power plant business units.

Project Descriptions

This investment will deploy the OpenText Document Management System selected in the commercial Request For Proposal (RFP) event executed in the first half of 2016. Deployment of the new Document Management System will provide a secure and reliable storage solution to serve the needs of the gas and electric business units. The project will be executed using internal National Grid resources, Solution Delivery Center partners, and professional services from the software vendor. Included in the scope of this project:

- Secure the necessary licenses, computing infrastructure, and professional services to deploy the product with minimal risk on the OpenText hosting platform;
- Design solution to meet business end to end process requirements;
- Deployment of the new Document Management System will follow a phased in approach, with the scheduling and deployment determined by business priority;
 - Note the rollout of the new system for Wave 1 teams (Gas Engineering & Design Downstate NY, Power Plant Operations, and Gas Schematics) has been completed.
- Deployment of the new Document Management System will include conversion of existing gas and electric documents stored in the current applications and shared file folders;
- Upgrade existing AutoCAD 2008 clients to current AutoCAD version to be compatible with the replacement Document Management System.

The scope of the project has been increased to include:

- Approximately 7K additional documents to be migrated for Gas Engineering Design (GED) – Downstate New York (NY) beyond what was originally known
- Addition of GED Upstate NY group
- Addition of GED New England (NE) group
- Addition of Operations and Support NY group
- There are Approximately 250K additional documents to be migrated for Electric beyond what was originally known
- Addition of Transmission NY and NE groups
- Addition of Distribution group
- Minor customization work
- Additional Open Text Modules/Licenses (Blazon for Content Suite, Blazon for Content Suite Add On, Object Importer, Remote Cache)
- AutoDesk product related work:
 - Purchase of additional AutoCAD and AutoDesk Architecture licenses – some of the current licenses are not eligible for upgrade
 - Replacing AutoDesk product license servers to allow the servers to be compatible with the new license server software
 - Migrating AutoCAD customizations
 - Creating AutoDesk product installer packages
 - AutoCAD training for Power Plant Operations team (for differences between AutoCAD 2009 and AutoCAD 2017).

Additional factors that have contributed to the costs for this project include:

- Revised hosting costs, which are more expensive than originally estimated.
- Due to the complexity and scale of the server configurations, greater than expected timeframe to evaluate the most effective end state hosting solution.
- Additional Open Text licenses and modules needed than previously estimated.

Summary of Benefits

Investment in a Document Management System will result in the following benefits to National Grid:

- Mitigates risk associated with inability of the document management system to retrieve accurate system documentation and maps. Key risks include:
 - More than two million drawings supporting Electric System, Gas Engineering and Power Plant Operations, could be lost if the Company's current Document Management Systems fail. These drawings and files are the backbone of the business and serve as documentation of

assets.

- Accidental damage to Company assets due to improper mark out or site details, and/or fines and litigation costs associated with improper site mark out.
- Power Plant Operation process safety hazards.
- Assures reliability of document retrieval and version control allowing National Grid to accurately locate gas mains and electric assets.

Business and Customer Issues

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

Alternatives

Number	Title
1	<p>Documentum</p> <p>Implement the latest version of Documentum. Rejected: Documentum was purchased by OpenText. OpenText clearly stated that they intended to discontinue support, enhancements, and upgrades for Documentum in the long term. As National Grid was looking for a long term strategic solution we could not select Documentum. This option was also dependent on the use of third party modules to provide the needed functionality and would not reduce our global application footprint. This is one of 5 solutions evaluated in the F&A (INVP 3985). Indicative cost \$13.509M with a tolerance of +/-25%.</p>
2	<p>IBM/MCLaren</p> <p>Implement the IBM FileNet product with the McLaren Lifecycle Suite. Rejected: This solution did not provide some key capabilities that were required (e.g. batch printing, transmittals). The file import wizard user interface was difficult to use. Lastly, the product roadmap is unclear which could limit the use of this solution as a strategic one. This is one of 5 solutions evaluated in the F&A (INVP 3985). Indicative cost \$14.012M with a tolerance of +/-25%.</p>
3	<p>Do Nothing</p> <p>Rejected: The potential risks to National Grid associated to the current Document Management Systems are unacceptable and require remediation at this time. Doing nothing or delaying this investment is not an acceptable option due to the potential risks associated to the current document storage methods. Thus, this alternative is not recommended going forward. Indicative cost N/A</p>

Related Projects, Scoring and Budget

Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount(\$M)
4408		DMS Replacement Delivery	14.273
Total:			14.273

Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
3985	Document Management System Replacement F&A	0.573
		0.573

Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Sanction Paper	Potential Investment Tolerance
4/11/2018	USSC	11.090	13.311	Partial Sanction	USSC-16-297 V3	25%
1/11/2017	USSC	5.653	8.177	Partial Sanction	USSC-16-297 V2	25%
11/9/2016	USSC	1.192	3.657	Partial Sanction	USSC-16-297	25%

Key Milestones

Milestone	Date (Month / Year)
Start Up	October, 2016
Partial Sanction	November, 2016
Begin Requirements and Design	November, 2016
Partial Sanction	January, 2017
Partial Sanction	April, 2018
Begin Development and Implementation	April, 2018
Project Sanction	June, 2019
Move to Production / Final Go Live	November, 2019
Project Closure Sanction	March, 2020

Next Planned Sanction

Date (Month/Year)	Purpose of Sanction Review
March, 2020	Closure

Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	The National Grid Book, page 62 item #3 in the IS Section states National Grid shall:
<input checked="" type="radio"/> Policy-Driven	<ul style="list-style-type: none"> Adhere to the defined Asset Management Lifecycle Policy and usage policies for IT assets to which the policies apply. Maintain all IT assets and services within the control of Global IS Service Delivery.
<input type="radio"/> Justified NPV	The project also is driven by National Grid's Data Management Policies. The National Grid Book (Data Management Section, P. 39) Provides that data should be: (1) managed and secure; (2) fit for purpose; and (3) standardized.
<input type="radio"/> Other	This project will move users onto a platform that can be better maintained and supported where the data will be managed to ensure high quality.

Asset Management Risk Score: 48

PRIMARY RISK SCORE DRIVER

Reliability Environment Health & Safety Not Policy Driven

Complexity Level: 17

High Complexity Medium Complexity Low Complexity N/A

Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project: Yes No

Current Planning Horizon

Capex	8.464	3.515	0.000	0.000	0.000	0.000	0.000	11.979
Opex	1.701	0.593	0.000	0.000	0.000	0.000	0.000	2.294
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	10.165	4.108	0.000	0.000	0.000	0.000	0.000	14.273

Resources, Operations, & Procurement

RESOURCE SOURCING

Engineering & design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input 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 delivery project:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
Availability of external resources to delivery 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
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PROCUREMENT IMPACT

Procurement impact on network system:	<input type="radio"/> Red	<input type="radio"/> Amber	<input checked="" type="radio"/> Green
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Key Issues

N/A

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

List References

N/A

Safety, Environmental and Project Planning Issues

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

Permitting

N/A

Investment Recovery and Customer Impact

Investment Recovery

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

Customer Impact

N/A

Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy				Risk Score	
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy		
18. Specific Risk	R1 - There is a risk that Documentum may fail due to unsupported software levels	IF the legacy systems fail before we are able to migrate the users and documents	THEN there may be data loss	Accept	The project team will work to migrate the users and documents as quickly as possible.	10
18. Specific Risk	R2 - There is a risk that OpenText may not be able to handle the data migration work.	IF OpenText fails to properly handle the data migration	THEN There could be delays in the project to complete the migration	Reduce	The project team added resources to assist OpenText with the migration.	6
18. Specific Risk	R3 - There is a risk that the quality of the metadata in the legacy system may be low and may push up the level of effort and cost to migrate the data.	IF the quality of the legacy metadata is lower than expected	THEN The cost to migrate the data may be higher than planned.	Accept	The project team added resources to assist OpenText with the migration. The project has risk money allocated for any additional needs.	12
18. Specific Risk	R4 - There is a risk that there may be localized bandwidth restrictions.	If there are localized bandwidth restrictions	THEN there may be additional cost to increase the bandwidth.	Accept	The project team will be performing tests to assess if this is a real issue or not. Mitigation strategies have been	12

Opex	1.701	0.593	0.000	0.000	0.000	0.000	0.000	2.294
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	10.165	4.108	0.000	0.000	0.000	0.000	0.000	14.273
	Prior Yrs	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Total
\$M		2020	2021	2022	2023	2024	2025	
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 Variance	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Cost Assumptions

This estimate was developed in 2019 using the standard IS estimating methodology which includes an assessment of project resource needs. Examples of these resource needs include hardware, software, internal and contract labor required to deliver the project. The accuracy level of estimate for each project is identified in the Cost Summary Table

Net Present Value / Cost Benefit Analysis

N/A

NPV Assumptions & Calculations

N/A

Additional Impacts

None

Statement of Support

Department	Individual	Responsibilities
Business Department	Turrini, Ross W.	Business Representative
Business Partner (BP)	Singh, Premjith	Relationship Manager
Program Delivery Management (PDM)	Mcnaught, Michelle	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Shattuck, Peter	Manager
Service Delivery	Mirizio, Mark	Manager
Enterprise Architecture	Lyba, Svetlana	Director

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.

Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

The US Sanctioning Committee (USSC) approved this paper at a meeting held on 06/12/2019:

(a) APPROVE the investment of \$14.273M and a tolerance of +/-10% for Full Implementation.

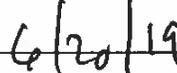
(b) NOTED that Kastler, John F. has the approved financial delegation

(c) Approved the run-the-business (RTB) of \$1.794M (per annum) for 5 years.

Signature



Date



David H. Campbell, Vice President US Treasury, USSC Chair

Appendix

COST BREAKDOWN STRUCTURE

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD +FTC)	Name of Firm(s) providing resources
Personnel	NG Resources	1.269	0.399	1.668	
	SDC Time & Materials	1.132	0.479	1.611	IBM
		0.479	0.220	0.698	WiPro
		0.065	-	0.065	DXC
		0.151	-	0.151	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	All other personnel	2.530	0.241	2.771	OpenText, Pontoon, ImaginIT, FDM
TOTAL Personnel Costs	5.627	1.338	6.965		
Hardware	Purchase	0.044	0.012	0.056	Cache Servers, Removable Storage
	Lease	0.754	0.083	0.836	MS Azure, OpenText, DXC
Software		2.888	0.593	3.481	Microsoft, OpenText, OpenLM
Risk Margin			0.437	0.437	
AFUDC		0.803	0.573	1.376	
Other		0.050	1.072	1.122	OpenText, Tax, Overheads
TOTAL Costs		10.165		14.273	

4.108

BENEFITTING COMPANIES

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp.	Electric Distribution	NY
Niagara Mohawk Power Corp.	Gas T&D	NY
Niagara Mohawk Power Corp.	Transmission	NY
KeySpan Energy Delivery New York	Gas T&D	NY
KeySpan Energy Delivery Long Island	Gas T&D	NY
Massachusetts Electric Company	Electric Distribution	MA
Massachusetts Electric Company	Transmission	MA
Nantucket Electric Company	Electric Distribution	MA
Boston Gas Company	Gas T&D	MA
Colonial Gas Company	Gas T&D	MA
Narragansett Electric Company	Electric Distribution	RI
Narragansett Gas Company	Gas Distribution	RI
Narragansett Electric Company	Transmission	RI
New England Power Company	Transmission	MA
NE Hydro - Trans Electric Co.	Transmission Hydro	MA
New England Hydro - Trans Corp.	Transmission Hydro	NH
New England Electric Trans Corp	Transmission Hydro	NH
KeySpan Generation LLC (PSA)	Ele Generation	NY
KeySpan Glenwood Energy Center	Ele Generation	NY
KeySpan Port Jefferson Energy Center	Ele Generation	NY

RTB COSTS

All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total
	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB	688.9	1,696.1	1,696.1	1,696.0	1,696.0	7,473.1
Last Sanction Business Net Impact to RTB						-
Last Sanction Total Net Impact to RTB	688.9	1,696.1	1,696.1	1,696.0	1,696.0	7,473.1
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB	1,301.1	1,851.6	1,851.6	1,851.6	1,851.6	8,707.5
Business Budgeted Net Impact to RTB						-
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB						

Forecasted at Go-Live	1,750.1	1,774.6	1,803.3	1,820.8	1,820.8	8,969.6
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	(449.0)	77.0	48.3	30.8	30.8	(262.1)
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	-



Closure: US Sanction Paper

Title:	New Arrearage Management Program	Sanction Paper #:	
Project #:	INVP 4421	Sanction Type:	Closure
Capex #:	5007668		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	6/24/2019
Author:	Gupta, Savita	Sponsor:	DeSousa, Kristin VP Customer Care
Utility Service:	IT	Project Manager:	Pawlowski, Michael J.

Executive Summary

This paper is presented to close INVP 4421. The total spend was \$0.738M. The original sanctioned amount for this project was \$0.671M at +/- 10%.

Project Summary

In response to the 2016 amendments to Rhode Island General Laws § 39-2-1, which amended the Henry Shelton Act, changes to the Customer Service System (CSS) were applied to accurately and efficiently manage the Arrearage Management Program (AMP) for low income electric and gas residential customers

Schedule Variance Table

Schedule Variance	
Project Grade - Ready to use Date	2/28/2018
Actual Ready to use Date	5/4/2018
Schedule Variance	0 year(s), 2 month(s), 5 day(s)

Schedule Variance Explanation

Cost Summary Table

Project Sanction Summary (\$M)

Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Capex	0.576	0.447	(0.129)
Opex	0.162	0.224	0.062
Removal	0.000	0.000	0.000

Total 0.738 0.671 (0.067)

Cost Variance Analysis

Capex overspend – Replanning of system integration test and late identification of stakeholders from Billing & Credit and Collections resulted into longer test cycle for System integration and UAT leading to variance for Capex spend.

The project cost variance is within tolerance

Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	0.576	0.447	(0.129)
	Opex	0.162	0.224	0.062
	Removal			0.000
	Total	0.738	0.671	(0.067)

Actual Spending (\$M) vs. Sanction (\$M)

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex			0.000
	Opex			0.000
	Removal			0.000
	Total	0.000	0.000	0.000

Project Sanction Summary (\$M)

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	0.576	0.447	(0.129)
	Opex	0.162	0.224	0.062
	Removal	0.000	0.000	0.000
	Total	0.738	0.671	(0.067)

Improvements / Lessons Learned

2019-LL-648: Stakeholder Engagement - Stakeholders from Billing Operations and Credit & Collections were not involved in the project early on, due to late engagement Go-Live was impacted

2019-LL-649: Significant scope changes – Tariff with state of RI was updated which resulted in significant scope change and resanction activity for the project

2019-LL-650: Data conversion – Data conversion activity completed ahead of schedule with proper planning and test runs of the routine

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been	

closed

All unused material have been returned

All as-builts have been completed

All lessons learned have been entered appropriately
into the lesson learned database

Yes No

Yes No

Yes No

Yes No

Statement of Support

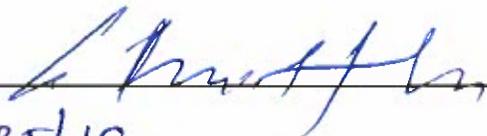
Department	Individual	Responsibilities
Business Department		Business Representative
Business Partner (BP)	Daly, Orla	Relationship Manager
Program Delivery Management (PDM)	Pawlowski, Michael J.	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Shattuck, Peter	Manager
Service Delivery	Mirizio, Mark	Manager
Enterprise Architecture	Clinchot, Joseph J.	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

The US ITSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

Signature 
Date 08/20/19

Premjith Singh
VP IT EPMO



Closure Template

Title:	INVP 4430 - Energy Efficiency Real Time Customer Data Sharing	Sanction Paper #:	4430
Project #:	INVP 4430	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/13/2018
Author:	Georgina Graham/ Riziel Cruz-Bower	Sponsor:	John Isberg, VP, Customer Operations
Utility Service:	IT	Project Manager:	Georgina Graham/ Riziel Cruz-Bower

1 Executive Summary

This paper is presented to close INVP4430. The total spend was \$0.568M. The original sanctioned amount for this project was \$0.767M at +/- 10%.

2 Project Summary

This project developed a scalable real-time customer data access framework from National Grid Legacy (CSS) to meet Demand Response and Energy Efficiency Programs (EE) program. Use of CIS (Comprehensive Integration Services *Oracle Fusion Bus) platform for Scalable Real Time Customer Data access (CSS) has been developed for the following Vendors as well has set-up a frame for future EE Vendors.

1. Simple Energy
2. Whisker Labs
3. EFI
4. CLEAResult



Closure Template

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP4430 Energy Efficiency Real Time Customer Data Sharing	Capex	0.000	0.000	0.000
	Opex	0.568	0.767	0.199
	Removal	0.000	0.000	0.000
	Total	0.568	0.767	0.199

3.2 Cost Variance Analysis

The project under spent the sanctioned budget amount by \$0.199 due to the following reasons:

1. Utilizing less staff than originally anticipated
2. 3rd Party Vendor EFI was descoped due to not being able to meet the project schedule.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	1/19/2018
Actual Ready for Use Date	1/19/2018
Schedule Variance	- 0 years, 0 months, 0 days

3.4 Schedule Variance Explanation

N/A



Closure Template

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP4430 Energy Efficiency Real Time Customer Data Sharing	Capex	0.000	0.000	0.000
	Opex	0.568	0.767	0.199
	Removal	0.000	0.000	0.000
	Total	0.568	0.767	0.199



Closure Template

5 Improvements / Lessons Learned / Root Cause

[REF#2018-LL-608](#) Lack of availability of 3rd party Vendors during all testing phases caused delays in the schedule. Acquire assurance from all Vendors, in writing, that all participants will be available during all phases of testing.

[REF#2018-LL-609](#) The flexibility within the Partners (IBM & Wipro) during the testing with the various 3rd partners was a huge asset to the project in order to meet the timeline. Continue to communicate with the partners on the timing of testing to ensure coverage is covered.

[REF#2018-LL-610](#) A change in scope to exclude EFI as the vendor was not ready with the technology/platform. Get a sign-off during Start-up phase so that each vendor has the capability and commitment to deliver.

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
Everything IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No



Closure Template

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Customer Operations	John Isberg	VP, Customer Operations
IT Solution Delivery	Narayan Devireddy	VP, Solution Delivery
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Riziel Cruz-Bower	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Tom Gill	Manager
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

7.2 Reviewers

N/A



Closure Template

8 Decisions

The US ISSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

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

John Gilbert, Global Head of Service Delivery
Acting US CIO



Closure: US Sanction Paper

Title:	Low Income Order	Sanction Paper #:	USSC-16-276 C
Project #:	INVP 4448	Sanction Type:	Closure
Capex #:	S007481 (CSS) ; C081658 (CRIS)		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	8/14/2019
Author:	Stallard, Susan	Sponsor:	Sobolewski, Terence Snr VP Customer Ops
Utility Service:	IT	Project Manager:	Cruz-Bower, Riziel

Executive Summary

This paper is presented to close INVP 4448. The total spend was \$8.281M. The original sanctioned amount for this project was \$8.759M at +/- 10%.

Project Summary

On May 20, 2016, the New York (NY) Public Service Commission (PSC) issued an Order Adopting Low Income Program Modifications and Directing Utility Filings in Case 14-M-0565, Proceeding on the Motion of the Commission to Examine Programs to Address Energy Affordability for Low Income Utility Customers. National Grid has implemented changes to the billing systems Customer Related Information System (CRIS) and Customer Service System (CSS) to support a tiered approach discount, based on the customer's income and energy burden for the NY territories low income program. Enhancements included enrolling current and future low income customers into the program, calculating the discount and billing; and required reporting. The current low income programs in all NY service territories have been replaced with the new program. Implementation of the Low Income Programs was handled in two phases with the first delivered in November 2016 under the INVP4363 Health and Human Services (HHS) Performance Measurement Files Project. The second phase was covered under this project for the delivery of the Human Resources Administration (HRA) to enroll and bill eligible low income customers.

Schedule Variance Table

	Schedule Variance
Project Grade - Ready to use Date	6/30/2018
Actual Ready to use Date	10/12/2018
Schedule Variance	0 year(s), 3 month(s), 14 day(s)

Schedule Variance Explanation

The reporting processes were scheduled to be delivered by June 30, 2018 from CSS and CRIS systems. One for CSS went on June 22, 2018 and the second, CRIS go-live got delayed and went on Oct 12, 2018. The reason for delay was getting exceptional approval during the MA work Stoppage.

Cost Summary Table

Project Sanction Summary (\$M)

	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	7.097	7.326	0.229
	Opex	1.184	1.433	0.249
	Removal	0.000	0.000	0.000
	Total	8.281	8.759	0.478

Cost Variance Analysis

The Low Income program was mandated to be deployed by Jan 1, 2017, not meeting this date could have resulted in significant financial penalties. The project was delivered in two work streams with the mandate program delivered on time on January 1, 2017 and a reporting processes to be delivered as the second work stream. Due to the mandated deliverables, a significant amount of potential overtime was included in project plans and the sanction requests. Actual spend on overtime did not reach the level of contingency that was included. The reporting processes were scheduled to be delivered by June 30, 2018 from CSS and CRIS systems.

Final Cost by Project**Actual Spending (\$M) vs. Sanction (\$M)**

Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4448	Capex	7.097	7.326	0.229
	Opex	1.184	1.433	0.249
	Removal			0.000
	Total	8.281	8.759	0.478

Project Sanction Summary (\$M)

	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	7.097	7.326	0.229
	Opex	1.184	1.433	0.249
	Removal	0.000	0.000	0.000
	Total	8.281	8.759	0.478

Improvements / Lessons Learned

2018-LL-550 : Early involvement of IS group is essential to business needs and technology selection process.

2018-LL-627 : Extra time was allocated in the project timeline.

2018-LL-567 : Complete and detailed deployment plan.

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused material have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No

All as-builts have been completed

Yes No

All lessons learned have been entered appropriately into the lesson learned database

Yes No

Statement of Support

Department	Individual	Responsibilities
Business Department	Clouston, Constance G.	Business Representative
Business Partner (BP)	Semel, Joel	Relationship Manager
Program Delivery Management (PDM)	Cruz-Bower, Riziel	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Wilson, Elaine	Director
Service Delivery	Mirizio, Mark	Manager
Enterprise Architecture	Clinchot, Joseph J.	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

The US Sanctioning Committee (USSC) approved this paper at a meeting held on 08/14/2019:

Signature D.H. Spill
Date 8/19/19

David H. Campbell, Vice President US Treasury, USSC Chair

Appendix

N/A



Closure Paper

Title:	Data Visualization	Sanction Paper #:	USSC-16-337C
Project #:	INVP 4464 Capex: S007546	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	1/9/2019
Author:	Lori Damiano	Sponsor:	John Gilbert
Utility Service:	IT	Project Manager:	Thomas Towne

1 Executive Summary

This paper is presented to close INVP 4464. The total spend was \$8.283M. The original sanctioned amount for this project was \$7.934M at +/- 10%.

2 Project Summary

This project established Tableau and Alteryx software solutions in a cloud environment to enable self-service reporting and data visualization capabilities for the organization. The solution provided the opportunity for improved decision-making by providing capabilities to enhance data access to very large data sets, analytics, data visualization and export to other analytical software capabilities. Over time, it will also establish the foundation to replace software tools for reporting that are no longer supported by the original vendor and produce essential reports for oversight of the operation.

The project provided the base infrastructure required to run the services, including:

- procurement of software
- installation of Tableau and Alteryx in a Cloud Environment
- packaging of software for deployment to desktops
- implementation of user and system support services
- end user training

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Data Visualization	Capex	8.183	7.819	(0.364)
	Opex	0.100	0.115	0.015
	Removal	0.000	0.000	0.000
	Total	8.283	7.934	(0.349)



Closure Paper

3.2 Cost Variance Analysis

The project cost variance is within tolerance.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	7/31/2017
Actual Ready for Use Date	3/16/2018
Schedule Variance	0 years, 7 months, 13 days

3.4 Schedule Variance Explanation

Challenges with setting up infrastructure in Azure caused implementation delays with the project.

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4464	Capex	8.183	7.819	(0.364)
	Opex	0.100	0.115	0.015
	Removal	0.000	0.000	0.000
	Total	8.283	7.934	(0.349)

5 Improvements / Lessons Learned/Root Cause

Positive:

- 2018-LL-599 (pending): Creating a standard BRD is sometimes infeasible for Agile projects which are gathering, changing, and implementing user requirements on a weekly, sometimes, daily basis: Create a product backlog to document the progress/evolution of user requirements over time. Create a separate enabling requirements document and/or functional requirements document if necessary.

Negative:

- 2018-LL-598 (pending): US SDF deliverables are not well-suited for Agile projects: Streamline documentation deliverables for Agile projects. Make sure that all necessary stakeholders approve the SDF approach.
- 2018-LL-600 (pending): Multiple iterations of dashboards were required to land on the final product: Plan for this in the schedule



Closure Paper

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	John Gilbert	Business Representative
Program Delivery Management (PDM)	Narayan Devireddy	Vice President IT, Solution Delivery
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Jeffrey Dailey	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Manager



Closure Paper

7.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



Closure Paper

8 Decisions

The US Sanctioning Committee (USSC) approved this paper at a USSC meeting held on 1/9/2019

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

Title:	Gas Capacity Request Database	Sanction Paper #:	USSC-17-387+
Project #:	INVP 4468 Capex: S007781	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/4/2018
Author:	Domenick Freda	Sponsor:	John S. Stavrakas VP, Asset Management Gas
Utility Service:	IS	Project Manager:	Domenick Freda

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4468 in the amount of \$1.965M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$1.965M broken down into:

- \$1.593M Capex*
- \$0.372M Opex*
- \$0.0M Removal*

1.2 Project Summary

The Gas Capacity Request (GCR) Application is a critical application for daily gas operations. Data related to gas capacity requests are generated by the Gas Sales and Marketing department for engineering analysis of the load. The information is used to generate load files for the gas sales models across all National Grid service territories. Sales models are updated daily and used to analyze the gas capacity available on the network. New customer gas load requests are then evaluated and approved based on the network capacity stored in the GCR database.

The current GCR application and supporting database does not satisfy current business scalability and reliability standards. This project will migrate the GCR database to an enterprise level solution, provide additional automated monitoring tools for production assets, and enhance support and application availability.

1.3 Summary of Projects

N/A



US Sanction Paper

1.4 Associated Projects

N/A

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
1/10/18	USSC	\$0.821M	\$1.703M	Partial	+/-10%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
April 2019	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	<p>The project aims to improve the gas capacity request process by implementing an enterprise supported front-end and back-end, and bring this application into IS support and monitoring. The GCR application is currently supported by the gas business teams.</p> <p>This change has been proposed in support of gas policy ENG02001, related to the designing of gas services by Gas Operations Engineering.</p>
<input checked="" type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: 36

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: 13

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 FY19/23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$0.557M

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

Re-allocation of budget within the IS business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.



US Sanction Paper

1.13 Current Planning Horizon

		Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
\$M	Prior Yrs	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.012	1.581	0.000	0.000	0.000	0.000	0.000	1.593
OpEx	0.229	0.144	0.000	0.000	0.000	0.000	0.000	0.372
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	0.241	1.725	0.000	0.000	0.000	0.000	0.000	1.965

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Partial Sanction	December 2017
Begin Requirements and Design	January 2018
Project Sanction	September 2018
Begin Development and Implementation	September 2018
Move to Production / Last Go Live	February 2019
Project Closure	April 2019

1.15 Resources, Operations and Procurement

Resource Sourcing			
Engineering & Design Resources to be provided	<input checked="" type="checkbox"/> Internal	<input 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

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$1.965M and a tolerance of +/-10% for the purposes of Development & Implementation.
- (b) APPROVE the run-the-business (RTB) of \$0.060M (per annum) for 5 years.
- (c) NOTED that Michelle McNaught is the Project Manager and has the approved financial delegation.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	Gas Capacity Request Database	Sanction Paper #:	USSC-17-387+
Project #:	INVP 4468 Capex: S007781	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/4/2018
Author:	Domenick Freda	Sponsor:	John Stavrakas VP, Asset Management Gas
Utility Service:	IS	Project Manager:	Domenick Freda

3.1 *Background*

The Gas Capacity Request (GCR) Database Application was built on Microsoft Access which includes a front end and back end database. The purpose of the GCR database is to store all the pertinent information related to GCR requests. The GCR front end application available functions are Add/Update forms, reports and a query tool.

Gas Sales and Marketing representatives generate GCR requests (changes and new requests) which are entered into the GridForce (SalesForce) application. These requests are compiled into load files by region (New York and New England) on a daily basis. The load files are converted to .mdb files and loaded to the database automatically every night.

The GridForce nightly extract data from the previous day is available the next morning by region in .csv format on a shared drive. The Operations Engineers analyze this data to assist in determining approval or rejection of GCR (load) requests. The business has become dependent upon the accuracy of the GCR database for this modelling and analysis.

The application is experiencing failures at an increasing rate due to several factors:

- Failure in daily processes due to update failure and business resource is not available to fix
- No automated monitoring of batch processes
- Failure in daily processes due to password expiration
- Failure due to Access files growing larger than 2 GB

Failures in daily database updates may result in inaccurate load files being sent to the Synergi tool, which is used for gas network modelling, resulting inaccurate gas capacity analysis results.



US Sanction Paper

3.2 Drivers

The primary drivers for this project are:

- Daily database update failures occur often and result in inaccurate load files being sent to the Stoner Network Distribution models further resulting in erroneous gas capacity analysis results.
- This application is critical for Operations Engineering who need 24/7 availability and support
- Current GCR application is an in house Microsoft Access application without dedicated support resources or disaster recovery capability
- Current software does not support additional functionality and process improvement requirements

3.3 Project Description

The investment will provide the following:

- Migration of the Gas Capacity Request database to an enterprise level solution
- Additional automated monitoring tools for production assets
- Enhanced support and application availability

3.4 Benefits Summary

The following benefits will be achieved:

- Standardized software platform on identified enterprise strategic tools
- Integration and reliability that supports the GCR request process accurately with fewer failures, user issues, and outages
- Enhanced forms and validation processes for the Sales and Marketing department
- Dedicated support and disaster recovery infrastructure
- Standardized business processes across regions

3.5 Business and Customer Issues

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



US Sanction Paper

3.6 *Alternatives*

Alternative 1: Do Nothing/Defer: This option is not recommended because the application database does not support the current business scalability requirements. As the database grows, the performance and reliability will continue to deteriorate. Also, Microsoft Access does not meet National Grid's criteria for an enterprise solution.

3.7 *Safety, Environmental and Project Planning Issues*

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

3.8 *Execution Risk Appraisal*

N/A

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

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total	
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +		
4468	Gas Capacity Request Database	+/- 10%	CapEx	0.012	1.581	0.000	0.000	0.000	0.000	0.000	0.000	1.593
			OpEx	0.229	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.372
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.241	1.725	0.000	0.000	0.000	0.000	0.000	0.000	1.965
Total Project Sanction			CapEx	0.012	1.581	0.000	0.000	0.000	0.000	0.000	0.000	1.593
			OpEx	0.229	0.144	0.000	0.000	0.000	0.000	0.000	0.000	0.372
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.241	1.725	0.000	0.000	0.000	0.000	0.000	0.000	1.965

3.11.2 Project Budget Summary Table

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
CapEx	0.012	1.045	0.000	0.000	0.000	0.000	0.000	1.057
OpEx	0.229	0.123	0.000	0.000	0.000	0.000	0.000	0.352
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.241	1.168	0.000	0.000	0.000	0.000	0.000	1.409

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 +	
CapEx	0.000	(0.536)	0.000	0.000	0.000	0.000	0.000	(0.536)
OpEx	0.000	(0.021)	0.000	0.000	0.000	0.000	0.000	(0.021)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(0.557)	0.000	0.000	0.000	0.000	0.000	(0.557)

3.11.3 Cost Assumptions

The accuracy level of estimate of each project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

N/A



US Sanction Paper

3.11.4.2 NPV Assumptions and Calculations

3.11.5 Additional Impacts

N/A

3.12 Statements of Support

3.12.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Syed, Salim	Business Representative
PDM	Rollins, Deborah	Head of PDM
BRM	Sheer, Richard	Relationship Manager
PDM	McNaught, Michelle	Program Delivery Director
IS Finance	Harris, Michelle	Manager
IS Regulatory	DeMauro, Daniel	Director
DR&S	Mandel, Marc	Manager
Service Delivery	Mirizio, Mark	Manager
Enterprise Architecture	Lyba, Svetlana	Manager

3.12.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

4 Appendices

4.1 Sanction Request Breakdown by Project

N/A



US Sanction Paper

4.2 Other Appendices

4.2.1 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	VOWD	FTC	FAC=VOWD+FTC	Name of Firm(s) providing resources
Personnel	NG Resources	0.284	0.269	0.553	
	SDC Time & Materials	0.000	-	-	IBM
		0.000	-	-	WiPro
		0.000	-	-	DXC
		0.000	-	-	Verizon
	SDC Fixed-Price	0.000	-	-	IBM
		0.000	-	-	WiPro
		0.000	-	-	DXC
		0.000	-	-	Verizon
	All other personnel	0.241	0.954	1.195	
TOTAL Personnel Costs	0.525	1.223	1.748		
Hardware	Purchase	0.000	-	-	
	Lease	0.000	-	-	
Software		0.000	0.021	0.021	
Risk Margin			0.117	0.117	
AFUDC		0.008	0.049	0.057	
Other		0.007	0.014	0.021	
	TOTAL Costs	0.540	1.425	1.965	Should match Financial Summary Total

4.2.2 Benefiting Operating Companies

Benefiting Operating Companies	Business Area	State
KeySpan Energy Delivery New York	Gas Distribution	NY
KeySpan Energy Delivery Long Island	Gas Distribution	NY
Boston Gas Company	Gas Distribution	MA
Niagara Mohawk Power Corp. - Gas	Gas Distribution	NY
Narragansett Gas Company	Gas Distribution	RI
Colonial Gas Company	Gas Distribution	MA

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.



US Sanction Paper

INV ID:	4468				Forecast Date:	03/05/18	
Investment Name:	Gas Capacity Request Database				Go-Live Date:	1/31/2019	
Project Manager:	Travis Coleman			PDM:	Michelle McNaught		
All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total	
	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23		
Last Sanctioned Net Impact to RTB							
Last Sanction IS Net Impact to RTB	40.0	60.0	60.0	60.0	60.0	280.0	
Last Sanction Business Net Impact to RTB						-	
Last Sanction Total Net Impact to RTB	40.0	60.0	60.0	60.0	60.0	280.0	
Planned/Budgeted Net Impact to RTB							
IS Investment Plan Net Impact to RTB	40.0	60.0	60.0	60.0	60.0	280.0	
Business Budgeted Net Impact to RTB						-	
Currently Forecasted Net Impact to RTB							
IS Funded Net Impact to RTB Forecasted at Go-Live	9.9	38.6	38.0	37.6	37.4	161.5	
Business Funded Net Impact to RTB Forecasted at Go-Live	-	21.0	21.0	21.0	21.0	84.0	
Variance to Planned/Budgeted Net Impact to RTB							
IS Investment Plan Net Impact to RTB Variance	30.1	21.4	22.0	22.4	22.6	118.5	
Business Budgeted Net Impact to RTB Variance	-	(21.0)	(21.0)	(21.0)	(21.0)	(84.0)	

4.3 NPV Summary (if applicable)

N/A

4.4 Customer Outreach Plan

N/A



Closure: US Sanction Paper

Title:	Gas Capacity Request Database	Sanction Paper #:	USSC-17-387+
Project #:	INVP 4468	Sanction Type:	Closure
Capex #:	S007781		
Operating Company:	National Grid USA Svc. Co.	Date of Request:	6/11/2019
Author:	Freda, Domenick	Sponsor(s):	Stavrakas, John S.
Utility Service:	IT	Project Manager:	Freda, Domenick

Executive Summary

Note: The latest sanction amount was M.
 This paper is presented to close INVP 4468. The total spend was \$1.748M. The original sanctioned amount for this project was \$1.965M at +/- 10%.

Project Summary

The Gas Capacity Request (GCR) Application is a critical application for daily gas operations, facilitating engineering analysis for available gas capacity on the network while generating load files for the Gas Sales Models across all National Grid service territories needed to approve or reject new customer gas load requests.

This project updated the current GCR application and supporting database to meet scalability and reliability standards. This project migrated the GCR functionality to an enterprise level solution, Salesforce.com, and provided additional automated monitoring tools for production assets through Tableau and Alteryx reporting and data analytics tools, and established enhanced support models through National Grid IT Support to address availability business concerns.

Schedule Variance Table

Schedule Variance	
Project Grade - Ready to use Date	2/28/2019
Actual Ready to use Date	2/12/2019
Schedule Variance	0 year(s), 0 month(s), 16 day(s)

Cost Summary Table

Project Sanction Summary (\$M)				
	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	1.444	1.593	0.149
	Opex	0.304	0.372	0.068
	Removal	0.000	0.000	0.000
	Total	1.748	1.965	0.217

Cost Variance Analysis

Actual project costs were below sanctioned values by \$0.217M (11%) as the result of lower than expected vendor costs and reductions in National Grid labor costs. Professional Service and Expense costs from Accenture and Cleartelligence were reduced by \$0.108M due to leveraging offshore resources and teleconferencing with onshore and offshore teams. Salesforce.com license costs were reduced by \$0.021M as the project was able to leverage existing licenses under the latest contract negotiated by IT Commercial. As professional service costs were reduced, an additional \$0.075M contingency budget was not used. National Grid labor expenses were reduced due to rebalancing of project resources for the development and implementation phases, including a reduction of \$0.013M in project management costs.

Final Cost by Project

Information Technology Capital Investment Quarterly Report

Fourth Quarter Ended August 31, 2019

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
	Capex	1.444	1.593	0.149
	Opex	0.304	0.372	0.068
	Removal	0.000	0.000	0.000
	Total	1.748	1.965	0.217
Project Sanction Summary (\$M)				
	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	1.444	1.593	0.149
	Opex	0.304	0.372	0.068
	Removal	0.000	0.000	0.000
	Total	1.748	1.965	0.217

Attachment 9

Page 48 of 177

Improvements / Lessons Learned

2019-LL-701 Ensure that for any Early Life Support Bug Fixes that full regression testing is completed and leverage UAT scripts for all subsequent testing.

2019-LL-702 Ensure that all business groups and user roles are involved in User Acceptance Testing; confirm with business system owner that all parties are represented in testing scripts and involved in test efforts.

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused material have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All as-builts have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

Statement of Support

Department	Individual	Responsibilities
Business Department	NMPC\syeds	Business Representative
Business Partner (BP)	Costa, Andrea	Relationship Manager
Program Delivery Management (PDM)	Mcnaught, Michelle	Program Delivery Director
IT Finance	Harris, Michelle	Manager
IT Regulatory	DeMauro, Daniel J.	Director
Digital Risk and Security (DR&S)	Wilson, Elaine	Director
Service Delivery	Mirizio, Mark	Principal Analyst
ARB Verification	Lyba, Svetlana	Director
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

Information Technology Capital

I approve this paper.

Signature _____

Date _____

Christine McClure, Vice President, Finance Business Partner Service Company, USSC Chair

Appendix



Closure Paper

Title:	Mandated IS Projects FY18	Sanction Paper #:	USSC-17-230C
Project #:	INVP 4470 Capex: S007683	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	9/12/2018
Author:	Douglas McCarthy	Sponsor:	John Gilbert, Global Head IS Service Delivery
Utility Service:	IS	Project Manager:	Aman Aneja

1 Executive Summary

This paper is presented to close INVP 4470. The total spend was \$0.000M. The original sanctioned amount for this project was \$8.859M at +/- 10% (project grade).

2 Project Summary

This blanket project provided a funding base and governance structure needed to respond to any regulatory mandate, regulatory audit, or compliance reporting that occurred during fiscal year 2018 in any of the National Grid US service territories.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Mandated IS Projects FY18	Capex	0.000	7.296	7.296
	Opex	0.000	1.563	1.563
	Removal	0.000	0.000	0.000
	Total	0.000	8.859	8.859

3.2 Cost Variance Analysis

The originally sanctioned amount of \$8.859M represents a budgetary estimate of IS funding needed to respond to regulatory mandates, regulatory audits, or compliance reporting requirements that occurred during the course of fiscal year 2018. Individual investments were raised, sanctioned, and executed through-out 2018. These individually sanctioned stand-alone projects will be closed separately. As a result, no charges have been billed to this blanket, "INVP4470 - Mandated IS Projects FY18".



Closure Paper

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	3/31/2018
Actual Ready for Use Date	3/31/2018
Schedule Variance	- 0 years, 0 months, 0 days

3.4 Schedule Variance Explanation

N/A

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4470	Capex	0.000	7.296	7.296
	Opex	0.000	1.563	1.563
	Removal	0.000	0.000	0.000
	Total		0.000	8.859

Actual Spending (\$M) vs. Sanction (\$M)				
	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	0.000	7.296	7.296
	Opex	0.000	1.563	1.563
	Removal	0.000	0.000	0.000
	Total		0.000	8.859

5 Improvements / Lessons Learned/Root Cause

N/A



Closure Paper

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IS Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IS Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Sponsor	Aman Aneja	Business Representative
Head of PDM	Deborah Rollins	Head of PDM
BRM	Aman Aneja	Relationship Manager
PDM	N/A	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Daniel DeMauro	Director
DR&S	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director



Closure Paper

7.2 Reviewers

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

Function	Individual
Regulatory	Maria Harvey
Jurisdictional Delegate - Electric NE	Sonny Anand
Jurisdictional Delegate - Electric NY	Mark A. Harbaugh
Jurisdictional Delegate - FERC	Terron Hill
Jurisdictional Delegate - Gas NE	John Currie
Jurisdictional Delegate - Gas NY	Don Wolf
Procurement	Diego Chevere



Closure Template

8 Decisions

The US Sanctioning Committee (USSC) approved this paper at a USSC meeting held on 09/12/2018.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



Closure Paper

Title:	Mobile Material Assistant (MMA) Implementation	Sanction Paper #:	
Project #:	INVP 4478	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/20/2018
Author / NG Representative:	Diane Beard / Ella Weisbord	Sponsor:	Rabi Bhattacharjee VP, Supply Chain (US)
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary

This paper is presented to close INVP 4478. The total spend was \$0.370M. The original sanctioned amount for this project was \$0.339M at +/- 10%.

2 Project Summary

This project supported the implementation of the Barcoding Inc. software package to enable the use of the new Mobile Material Assistant (MMA) handheld scanner devices used by National Grid’s Inventory Management team to manage inventory. The project replaced the inbound and outbound interfaces between the MMA system and SAP, installed the new Barcoding Inc. application on the new handheld devices and decommissioned the existing web application, existing interfaces, and batch jobs running on the National Grid network.

3 Variance Analysis

3.1 Cost Summary Table

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP 4478 Mobile Material Assistant (MMA) Implementation	Capex	0.301	0.270	(0.031)
	Opex	0.069	0.069	0.000
	Removal	0.000	0.000	0.000
	Total	0.370	0.339	(0.031)



Closure Paper

3.2 Cost Variance Analysis

During design phase it was determined by National Grid’s Digital Risk & Security (DR&S) department that the Android barcode scanner would need to first be enrolled with AirWatch before it could connect to the National Grid’s network for file sharing. This added additional scope and delays account for an increase of costs to the project.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	2/5/2018
Actual Ready for Use Date	8/30/2018
Schedule Variance	0 years, 6 months, 25 days

3.4 Schedule Variance Explanation

During the design phase of the project, it was determined by National Grid’s DR&S department that the Android barcode scanner would need to first be enrolled with AirWatch before it could connect to the NG network for file sharing. The project go-live was delayed due to the time required to work with VMWare to analyze, design, and deploy a solution to enroll the Android barcode scanner with AirWatch.

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP 4478 Mobile Material Assistant (MMA) Implementation	Capex	0.301	0.270	(0.031)
	Opex	0.069	0.069	0.000
	Removal	0.000	0.000	0.000
	Total	0.370	0.339	(0.031)



Closure Paper

5 Improvements / Lessons Learned/Root Cause

[Ref #] The Mobile Material Assistance project deployed an application on a modern barcode scanner to ensure the Inventory Management department can replace the old MMA-scanners which are out-of-service and no longer repairable by the hardware vendor.

Additionally the new application provides for:

- Wi-Fi connectivity to National Grid’s network for real-time updates to SAP
- Network security through device enrollment with AirWatch

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No



Closure Paper

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Robert Wind	Business Representative
Program Delivery Management (PDM)	Narayan Devireddy	Head of PDM
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michele Harris	Manager
IT Regulatory	Thomas Gill	Manager
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joseph Clinchot	Director

7.2 Reviewers

N/A



Closure Paper

8 Decisions

The US ISSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

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

Premjith Singh
VP IT Tower, Lead, Operations and Network



Closure Paper

Title:	Gas System Operating Procedure (SOP) Upgrade	Sanction Paper #:	
Project #:	INVP 4480 Capex: S007758	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/8/2019
Author:	Lakmal Egodawatte	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Lakmal Egodawatte

1 Executive Summary

This paper is presented to close INVP 4480. The total spend was \$0.374M. The original sanctioned amount for this project was \$0.706M at +/- 10%.

2 Project Summary

Gas System Operating Procedure (SOP) was developed internally at National Grid to manage construction work in the gas systems in New York and New England. SOP orders were a regulatory requirement to facilitate safe operations while maintaining National Grid's gas infrastructure. The existing system was initially deployed eleven years ago, and was reaching end-of-life due to the age of its computing infrastructure. The system was becoming unstable, and was difficult to modify and enhance.

This investment delivered a refresh of the aging SOP application infrastructure assets to current supported versions and expansion of infrastructure.

3 Variance Analysis

Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Gas System Operating Procedure (SOP) Upgrade	Capex	0.257	0.502	0.245
	Opex	0.117	0.204	0.087
	Removal	0.000	0.000	0.000
	Total	0.374	0.706	0.332



Closure Paper

Cost Variance Analysis

Positive cost variance due to:

- Project risk budget was not spent.
- Project resources were not needed to the extent allocated and in some cases released earlier than planned from the project.
- Actual vendor costs came in lower than expected.
- Initial estimates provided for licensing costs did not take into account agreements in place that provide for National Grid discounts.

3.1 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	6/30/2018
Actual Ready for Use Date	5/27/2018
Schedule Variance	- 0 years, 1 months, 3 days

3.2 Schedule Variance Explanation

N/A

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4480	Capex	0.257	0.502	0.245
	Opex	0.117	0.204	0.087
	Removal	0.000	0.000	0.000
	Total	0.374	0.706	0.332



Closure Paper

5 Improvements / Lessons Learned/Root Cause

- Project team ran .Net framework upgrade in the test environment to manage challenges we potentially may face in production environment. This helped for a smooth Deployment of the application. (2019-LL-635)
- Corporate ora file configuration came in to picture in the latter point of the project. Development team took necessary actions to accommodate changes. This issue would have been smoothly handled if the support team was engaged early on to clarify potential issue. (2019-LL-636)
- During the project life time the server lease cost should be charged from project budget. But server lease cost from the vendor was charged to the RTB accounting during the project. Team was able to identify the issue and correct the charges to the right accounting. All projects which require server lease should ensure these costs are being charged to the project budget, during the project and move to RTB, after go live. (2019-LL-637)
- Market pricing was considered when estimating cost for licenses. National Grid has a pool of licenses which are provided at a discount rate. It is advised to receive quotes for licenses from National Grid Asset Management team for Projects. (2019-LL-638)

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No



Closure Paper

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	John Spink	Business Representative
Business Partner (BP)	Premjith Singh	Relationship Manager
Program Delivery Management (PDM)	Sally Seltzer	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Tom Gill	Manager
Digital Risk and Security (DR&S)	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

7.2 Reviewers

N/A



Closure Paper

8 Decisions

I approve this paper.

Signature.....Date.....
David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

Title:	US MDS-Energy Accounting System Migration to Wholesale Settlement Application - NY	Sanction Paper #:	USSC-17-351v3
Project #:	INVP 4481 Capex: C079726	Sanction Type:	Partial Sanction
Operating Company:	Niagara Mohawk Power Corp.	Date of Request:	3/26/2019
Author:	Susan Stallard Teders / Jeff Wilson	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Jeff Wilson / Jeff Dailey

1 Executive Summary

1.1 Sanctioning Summary

This paper requests partial sanction of INVP 4481 in the amount of \$0.840M with a tolerance of +/- 10% for the purposes of Development and Implementation of Workstream 1 - Advance Metering Infrastructure (AMI) meter updates and Request for Proposal (RFP) for the replacement of the Wholesale Settlement systems.

This sanction amount is \$0.840M broken down into:

- \$0.781M Capex*
- \$0.059M Opex*
- \$0.000M Removal*

NOTE the potential investment of \$1.780M with a tolerance of +/- 25, contingent upon submittal and approval of a Project Sanction paper following completion of Development and Implementation of Workstream 1 - Advance Metering Infrastructure (AMI) meter updates and Request for Proposal (RFP) for the replacement of the Wholesale Settlement systems.

1.2 Project Summary

This mandatory project is a multi-part / multi workstream project that will meet the New York Independent System Operator (NYISO) Revenue Billing and Accounting Manual requirement to, “provide enhanced functionality related to wholesale settlement quality control in each NY load zone.” Workstream 1 will include the enhancements needed to support the AMI meters supported by Itron Enterprise Edition™ Meter Data Management (IEE MDM) system for National Grid’s Smart Energy Solutions that National Grid has deployed as part of the INVP 4298 Clifton Park Project. Also included as part of this workstream will be a RFP for replacement of National Grid’s Wholesale



US Sanction Paper

Settlement systems. Future Workstreams will be defined after the RFP has been completed.

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4481 Capex: C079726	US MDS-Energy Accounting System Migration to Wholesale Settlement Application - NY	1.780
Total		1.780

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4481A	US MDS-Energy Accounting System Migration to Wholesale Settlement Application - NE	1.178
INVP 4298	NY REV Clifton Park Demo Information System Rediness	1.288

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
11/8/17	USSC	\$0.490M	\$2.356M	Partial	+/-25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
July 2019	Project Sanction



US Sanction Paper

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Mandatory: Meet the NYISO Revenue Billing and Accounting Manual, authorized under the NYISO file Market Rules, by integrating the Energy Accounting System (EAS) functionality into the Wholesale Settlement Application (WSA), while also upgrading WSA.

1.8 Asset Management Risk Score

Asset Management Risk Score: 48

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: 20

1.10 Process Hazard Assessment

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

- Yes
 No



US Sanction Paper

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 (\$)
IT Investment Plan FY20 - 24	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input checked="" type="radio"/> Under <input type="radio"/> NA	\$0.001M

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

Re-allocation of budget within the IT business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2019/20	Yr. 2 2020/21	Yr. 3 2021/22	Yr. 4 2022/23	Yr. 5 2023/24	Yr. 6 + 2024/25	
CapEx	0.278	1.004	0.382	0.000	0.000	0.000	0.000	1.664
OpEx	0.030	0.000	0.086	0.000	0.000	0.000	0.000	0.116
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	0.308	1.004	0.468	0.000	0.000	0.000	0.000	1.780

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	August 2017
Partial Sanction	November 2017
Begin Requirements and Design	November 2017
Partial Sanction	April 2019
Project Sanction	July 2019
Begin Development and Implementation	June 2019
Move to Production / Last Go Live	July 2020
Project Closure	October 2020



US Sanction Paper

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

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

N/A



US Sanction Paper

2 Decisions

- I:
- (a) APPROVE this paper and the investment of \$0.840M and a tolerance of +/-10% for the purposes of partial Development and Implementation.
 - (b) NOTE the potential run-the-business (RTB) and will be determined prior to the project sanction in July 2019.
 - (c) NOTE the potential investment \$ 1.780M and a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design.
 - (d) NOTE that Jeff Daily is the Project Manager and has the approved financial delegation to undertake the activities stated in (a).

Signature.....Date.....
David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	US MDS-Energy Accounting System Migration to Wholesale Settlement Application - NY	Sanction Paper #:	USSC-17-351v3
Project #:	INVP 4481 Capex: C079726	Sanction Type:	Partial Sanction
Operating Company:	Niagara Mohawk Power Co.	Date of Request:	3/26/2019
Author:	Susan Stallard Teders / Jeff Wilson	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Jeff Wilson / Jeff Dailey

3.1 Background

This project is two-fold. The first part will support new requirements for the AMI meters that were implemented in July 2018 to support National Grid's Clifton Park Demonstration Project (INVP 4298). The Clifton Park Demonstration Project enabled 13,217 electric AMI meters for residential customers in the Clifton Park region allowing them to participate in New York's Reforming the Energy Vision (REV), program, and conduct a RFP for the replacement of National Grid's current Wholesale Settlement systems. The second part of this project will be to replace the Wholesale Settlement systems selected from the RFP process.

Wholesale Settlement is the process of reconciling the generation and transmission of electricity, minus line losses and unaccounted usage, for each customer in each load zone. The wholesale customer load is used to monetarily settle with the Independent System Operators (ISOs) and, therefore, other stakeholders, such as transmission companies, load serving entities (LSEs), energy supply companies (ESCOs), and municipal utilities and generators. It is also the basis for the retail settlement process for all customers. The process is supported by the data outputs from Energy Accounting System (EAS) in New York (NY). EAS is built on architecture that was retired in 2011. Due to the risks associated with unsupported EAS infrastructure and code, this functionality will be incorporated into the upgraded WSA application.

The EAS application is based on a 30-year-old process diagram that is not adaptable for the new settlement requirements and have experienced Priority 1 (P1) or Priority 2 (P2) incidents where work has had to be completed manually. P1 and P2 outage time is defined as incidents when all or almost all of the critical functions of an application are not working as expected. When an incident occurs in EAS, manual effort may



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circumvent the issues experienced and has to date, but this is not sustainable in the long-term. As such, the current technology does not allow for business process continuity.

As a result of these performance issues, there is the potential for exposure for a market participant complaint at the Federal Energy Regulatory Commission (FERC) or potential litigation. This is in addition to the risk of reduced customer satisfaction. The Independent System Operators New England Inc (ISO-NE) may also invoke proceedings for tariff violations against New England Power (NEP), as the Host Participant in NE, or the NYISO against Niagara Mohawk, as the Meter Authority in NY.

The NY territory is at risk with Critical National Infrastructure (CNI) customers who require a timely settlement of the usage from their interval meters on a daily basis, as well as, a resettlement on a quarterly basis, from the data inputted into EAS and settled with the NYISO.

3.2 Drivers

The major driver of this project is:

- To meet the NYISO Revenue Billing and Accounting Manual policy. Failure to adhere could result in a tariff violation. NY's current manual settlement process puts National Grid at risk of not being able to meet deadlines and ensure that the input data is accurate. Additionally, National Grid is often scrutinized for accuracy by market generators and other capacity and energy market participants. Reputational damage has occurred and continues to be a major risk.

Secondary drivers are:

- To support the new requirements for the AMI meters. The application for the wholesale settlement process is on technology platform that is at risk of failure; thus, risking settlement legal challenges. If a failure occurs to the system, there is a legitimate chance that it might not be recoverable.
- Due to the retirement of the software version of the application. National Grid has experienced difficulties in finding experts to resolve application issues in a timely manner. New changes to the application can only be "hard coded," as there is no front-end customization or user control options.

3.3 Project Description

During Development and implementation (D&I), the following will be accomplished for the enhancements to the AMI meters:



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- Successfully build, configure, test and deploy
 - **Meter Aggregation:** Store sub meters in CSS and send sub meters in all configuration files from the customer system, CSS to Itron Enterprise Edition (IEE). Calculate Total Usage in IEE on the 'Master' Meter. Send total usage back up to CSS on the 'Master' Meter.
 - **General Formula Channel Usage in IEE MDM:** Flexible billing determinants for AMI programmed meters.
 - **LodeStar Enhanced (LSE) Export:** Modify the ADE (high volume data extract) process to produce a LodeStar Enhanced (LSE) format export in place of the current XML output. National Grid has a use case for their legacy internal applications (PULSE, settlement, etc.) that use either the LodeStar or LSE format. National Grid prefers to produce the LSE output using IEE's ADE process.
- Development and testing of the interfaces in scope
- Perform end to end testing before go-live
- Demonstrate successful Disaster Recovery testing
- Change Management and Training support
- Complete Service Transition into production

During the RFP phase of the project, the following will be accomplished:

- Document Business and Technical Requirements
- Document Key Business Issues, Pain Points and Challenges
- Document Key Business Benefits
- Document Key Capabilities Required
- Conduct Current State Technical and Functional Assessment
- Analyze Industry/ Market Research
- Identify Solution and Technology Options
- Complete Solution Options Analysis
- Develop Impact Assessment and ROI Benefits Summary
- Develop and Document Solution Recommendation
- Develop Solution Implementation Roadmap
- Develop Financial Workbook and a High-level Implementation Plan
- Summary and Recommendations/Executive Summary

There will be a secondary project, INVP 4481A EAS to WSA Migration – NE, which will upgrade or replace the Wholesale Settlement Application (WSA), as this application is currently used as the wholesale settlement system for New England (NE). The current version of WSA needs to be upgraded to enable Meter Data Services (MDS) Settlement to consistently provide high quality and dependable meter data settlement reporting. A separate sanction paper will be submitted for costs related to the NE Wholesale Settlement system.



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Future workstreams of this project will consolidate the EAS NY wholesale settlement processing application into the upgraded WSA application. EAS is used in NY and contains the data required for the completion of the wholesale settlement process while WSA is the automated application used in NE for the process. The functionalities of EAS will be migrated into the WSA, to improve upon the wholesale settlement market reporting and existing business processes. This project will combine the two platforms and upgrade WSA, providing functionality and reliability improvements for the wholesale settlement process.

Future project components include:

- Migration and testing of EAS capabilities into the replaced / upgraded WSA
- Decommissioning of the existing EAS application
- Decommissioning of the current WSA application
- A tested disaster recovery plan

3.4 Benefits Summary

- This investment will have a positive impact on the ability to complete the daily settlement and reconciliation process, as the automation of the load data will mitigate the risk of manual error and shorten the time required to complete the tasks associated with the process.
- By consolidating the two platforms and upgrading to a later version of WSA, we will improve the disaster recovery plan and site testing for the NY Wholesale Energy Settlement Market and improve performance.
- Stability and availability of a key business critical application.

3.5 Business and Customer Issues

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

3.6 Alternatives

Alternative 1: Upgrade the WSA system without completing a full RFP of industry applications

This option would upgrade National Grids current WSA system with a newer version from the vendor.

Rejected: This was rejected as there would be no comparable industry applications and the features that they may offer, which could lead to National Grid spending more money for an upgrade to WSA and receive less functionality.



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Indicative costs at +/- 25% for upgrading the current WSA system are expected from the RFP process.

Alternative 2: Do Nothing/Defer

To leave the wholesale settlement system as is, while manual intervention has successfully mitigated system failures to date. This is not sustainable for the long-term, due to the resource efforts required and added manual risk.

Rejected: This is rejected due to the NY wholesale settlement system and infrastructure having been classified as unsupported and internal business experts no longer available. Non-adherence to the NYISO Revenue Billing and Accounting Manual could result in a tariff violation and reputational damage to the Company.

Indicative Cost: N/A

3.7 Safety, Environmental and Project Planning Issues

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

3.8 Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy				Risk Score	
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy		
1. Project Requirements	R1 - Cloud Security Security	If connecting to internal interfaces by using the solution of cloud technology will have a security impact at National Grid.	Involve Digital Risk and Security team early in the project discussion.	Accept	Risk Response / Action	9
1. Project Requirements	R2 - Settlement Reporting Error	If by having a Single Data Source there is risk of Settlement Reporting Failure, Data Corruption, Data Integrity, Data Distribution, Data Reliability	Mitigation strategies must be developed and implemented by the project team.	Reduce	Risk Response / Action	3

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.



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3.10.2 Customer Impact

N/A

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 Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total	
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +		
INVP 4481 Capex: C079726	US MDS-Energy Accounting System Migration to Wholesale Settlement Application - NY	+/- 10%	CapEx	0.278	1.004	0.382	0.000	0.000	0.000	0.000	0.000	1.664
			OpEx	0.030	0.000	0.086	0.000	0.000	0.000	0.000	0.000	0.116
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.308	1.004	0.468	0.000	0.000	0.000	0.000	0.000	1.780
Total Project Sanction			CapEx	0.278	1.004	0.382	0.000	0.000	0.000	0.000	0.000	1.664
			OpEx	0.030	0.000	0.086	0.000	0.000	0.000	0.000	0.000	0.116
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.308	1.004	0.468	0.000	0.000	0.000	0.000	0.000	1.780

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 +	
CapEx	0.278	0.988	0.427	0.000	0.000	0.000	0.000	1.693
OpEx	0.030	0.000	0.059	0.000	0.000	0.000	0.000	0.089
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.308	0.988	0.486	0.000	0.000	0.000	0.000	1.781

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 +	
CapEx	0.000	(0.017)	0.045	0.000	0.000	0.000	0.000	0.029
OpEx	0.000	0.000	(0.028)	0.000	0.000	0.000	0.000	(0.028)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(0.017)	0.018	0.000	0.000	0.000	0.000	(0.001)



US Sanction Paper

3.11.3 Cost Assumptions

N/A

3.11.4 Net Present Value / Cost Benefit Analysis

This is not an NPV project.

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

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.

Department	Individual	Responsibilities
Business Department	Catherine McClure	Business Representative
Business Partner (BP)	Bob Lorkiewicz	Relationship Manager
Program Delivery Management (PDM)	Jeff Dailey	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Manager
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director (if Joe Clinchot or Svetlana Lyba) Manager (if other)

3.12.2 Reviewers

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

Function	Individual
Regulatory	Maria Harvey



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Jurisdictional Delegate - Electric NY	Mark A. Harbaugh
Jurisdictional Delegate - FERC	Terron Hill
Procurement	Diego Chevere



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4 Appendices

4.1 Sanction Request Breakdown by Project

N/A

4.2 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources		0.121	0.121	
	SDC Time & Materials		0.119	0.119	IBM
			0.019	0.019	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
		All other personnel	0.150	0.010	0.160
	TOTAL Personnel Costs	0.150	0.269	0.419	
Hardware	Purchase		-	-	
	Lease		-	-	
Software			0.828	0.828	
Risk Margin			0.082	0.082	
AFUDC			0.094	0.094	
Other			0.356	0.356	
	TOTAL Costs	0.150	1.629	1.779	

4.3 NPV Summary

N/A

4.4 Customer Outreach Plan

N/A



US Sanction Paper

4.5 Benefiting Operating Companies

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp	Transmission	NY

4.6 IT Ongoing Operational Costs (RTB):

The projects Run the Business (RTB) costs are TBD and will be determined prior the final project sanctioning in July 2019.

4.7 Other Appendices

N/A



US Sanction Paper

Title:	US MDS-Energy Accounting System Migration to Wholesale Settlement Application	Sanction Paper #:	USSC-17-351v2
Project #:	INVP 4481 Capex: C079730 & C079726	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/13/2018
Author:	Susan Stallard Teders / Jeff Wilson	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Jeff Wilson / Jeff Dailey

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4481 in the amount of \$3.538M with a tolerance of +/- 10% for the purposes of Full Implementation.

This sanction amount is \$3.538M broken down into:

- \$3.352M Capex*
- \$0.186M Opex*
- \$0.000M Removal*

1.2 Project Summary

This policy-driven project will meet the New York Independent System Operator (NYISO) Revenue Billing and Accounting Manual policy, by consolidating two existing, but separate wholesale settlement processing applications, which are at end of life, into a single application for the New York (NY) and New England (NE) jurisdictions. The expanded Wholesale Settlement Application (WSA) will provide enhanced functionality related to wholesale settlement quality control in each load zone within the NY and NE jurisdictions.

A consolidated, automated, and vendor supported wholesale settlement platform will reduce the risk of settlement reporting failure and data inconsistencies, making the settlement process more streamlined and efficient. Upon the migration of Energy Accounting System (EAS) into WSA, the project will also decommission the existing EAS application.



US Sanction Paper

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4481	EAS to WAS	3.538
Total		3.538

1.4 Associated Projects

N/A

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
11/8/17	USSC	\$0.490M	\$2.356M	Partial	+/- 25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
March 2020	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Policy: Meet the NYISO Revenue Billing and Accounting Manual policy, by integrating the Energy Accounting System (EAS) functionality into the Wholesale Settlement Application (WSA), while also upgrading WSA.



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1.8 Asset Management Risk Score

Asset Management Risk Score: 48

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: 20

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 (\$)
IT Investment Plan FY19 - 23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$1.354M



US Sanction Paper

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

Re-allocation of budget within the IT business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

		Current Planning Horizon						Total
		Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	
\$M		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
CapEx	0.007	0.779	2.566	0.000	0.000	0.000	0.000	3.352
OpEx	0.068	(0.009)	0.127	0.000	0.000	0.000	0.000	0.186
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	0.075	0.770	2.693	0.000	0.000	0.000	0.000	3.538

1.14 Key Milestones

Milestone	Target Date: (Month Year)
Start Up	August 2017
Partial Sanction	November 2017
Begin Requirements and Design	November 2017
Project Sanction	November 2018
Begin Development and Implementation	December 2018
Begin User Acceptance Testing	August 2019
Move to Production / Last Go Live	November 2019
Project Closure	March 2020



US Sanction Paper

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

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

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$3.538M and a tolerance of +/-10% for the purposes of Development and Implementation.
- (b) APPROVE the run-the-business (RTB) of \$0.036M for FY20 and \$0.143M (per annum) for 4 years.
- (c) NOTE that Jeff Dailey is the Project Manager and has the approved financial delegation.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	US MDS-Energy Accounting System Migration to Wholesale Settlement Application	Sanction Paper #:	USSC-17-351v2
Project #:	INVP 4481 C079730 & C079726	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	11/13/2018
Author:	Susan Stallard Teders / Jeff Wilson	Sponsor:	John Spink, VP Control Center Operations
Utility Service:	IT	Project Manager:	Jeff Wilson / Jeff Dailey

3.1 Background

Wholesale Settlement is the process of reconciling the generation and transmission of electricity, minus line losses and unaccounted usage, for each customer in each load zone. The wholesale customer load is used to monetarily settle with the Independent System Operators (ISOs) and, therefore, other stakeholders, such as transmission companies, load serving entities (LSEs), energy supply companies (ESCOs), and municipal utilities and generators. It is also the basis for the retail settlement process for all customers. The process is supported by the data outputs from Energy Accounting System (EAS) in New York (NY) and the Wholesale Settlement Application (WSA) in New England (NE). The current version of WSA needs to be upgraded to enable Meter Data Services (MDS) Settlement to consistently provide high quality and dependable meter data settlement reporting to the ISO New England Inc. (ISO-NE). This keeps the Company in compliance with ISO-NE Revenue Billing and Accounting Manual. Separately, EAS is built on architecture that was retired in 2011. Due to the risks associated with unsupported EAS infrastructure and code, this functionality will be incorporated into the upgraded WSA application. The upgrade of WSA and the consolidation of EAS into WSA will eliminate reliance on the existing legacy developed code of EAS.

The current software version of WSA is outdated and is only compatible with the Windows Server 2003 operating system (OS). The end of support for this OS was July 14, 2015 resulting in the following services being unavailable:

- Security patches that help protect PCs from harmful viruses, spyware, and other malicious software
- Assisted technical support from Microsoft
- Software and content updates



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The goal is to address the intermittent performance problems by co-locating the database and application in the same data center.

The EAS application is based on a 30-year-old process diagram that is not adaptable for the new settlement requirements. Integration of EAS into WSA should also allow for simplified maintenance and implementation of the vendor developed product versions into the National Grid Information Technology (IT) environment, instead of being supported by the Critical National Infrastructure (CNI) team. With CNI maintaining the server, a strain is put on resources dedicated to Control Room mission critical applications.

EAS has experienced Priority 1 (P1) or Priority 2 (P2) incidents where work has had to be completed manually. P1 and P2 outage time is defined as incidents when all or almost all of the critical functions of an application are not working as expected. When an incident occurs in EAS, manual effort may circumvent the issues experienced and has to date, but this is not sustainable in the long-term. As such, the current technology does not allow for business process continuity.

As a result of these performance issues, there is the potential for exposure for a market participant complaint at the Federal Energy Regulatory Commission (FERC) or in court. This is in addition to the risk of reputational damage. The ISO-NE may also invoke proceedings for tariff violations against New England Power (NEP), as the Host Participant in NE, or the NYISO against Niagara Mohawk, as the Meter Authority in NY.

The NY territory is at risk with the Critical National Infrastructure (CNI) customers who require a timely settlement of the usage from their interval meters on a daily basis, as well as a resettlement on a quarterly basis, from the data inputted into EAS and settled with the NYISO. While there is no history of penalties, it is more efficient to implement preventative measures by integrating EAS with WSA and upgrading the WSA platform.

3.2 Drivers

The major driver of this project is:

- To meet the NYISO Revenue Billing and Accounting Manual policy Non-adherence could result in a tariff violation. NY's current manual settlement process puts National Grid at risk of not being able to meet deadlines and ensure that the input data is accurate. Additionally, National Grid is often scrutinized for accuracy by market generators and other capacity and energy market participants. Reputational damage has occurred and continues to be a major risk.

Secondary drivers are:

- The applications used for the wholesale settlement process are both on technology platforms that are at risk of failure; thus, risking settlement legal



US Sanction Paper

challenges. If a failure occurs to the system, there is a legitimate chance that it might not be recoverable.

- Due to the retired software versions of the applications National Grid has experience difficulty in finding experts to resolve application issues in a timely manner. New changes to the application can only be “hard coded,” as there is no front-end customization or user control options.

3.3 Project Description

This project will consolidate the two existing wholesale settlement processing applications into a single application for NY and NE. EAS is used in NY and contains the data required for the completion of the wholesale settlement process while WSA is the automated application used in NE for the process. The functionalities of EAS will be migrated into the WSA, to improve upon the wholesale settlement market reporting and existing business processes. This project will combine the two platforms and upgrade WSA, providing functionality and reliability improvements for the wholesale settlement process.

Project components include:

- Purchase and implementation of new upgraded WSA application
- Migration and testing of current WSA capabilities into the upgraded WSA
- Migration and testing of EAS capabilities into the upgraded WSA
- Decommissioning of the existing EAS application
- Decommissioning of the current WSA application
- A tested disaster recovery plan

3.4 Benefits Summary

- This upgrade will help alleviate some of the processing and analytics time required for the NE wholesale settlement process.
- This investment will have a positive impact on the ability to complete the daily settlement and reconciliation process, as the automation of the load data will mitigate the risk of manual error and shorten the time required to complete the tasks associated with the process.
- By consolidating the two platforms and upgrading to a later version of WSA, we will insure a disaster recovery plan and site tested for the NY Wholesale Energy Settlement Market and improve performance.
- Stability and availability of a key business critical application.

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: Do Nothing/Defer

This is not an option. While manual intervention has successfully mitigated system failures to date, this is not sustainable for the long-term, due to the resource efforts required and added manual risk. The business is projecting this to be increasingly difficult, as both the system and infrastructure have been classified as unsupported and internal business experts are no longer available. Non-adherence to the NYISO Revenue Billing and Accounting Manual could result in a tariff violation and reputational damage to 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	Risk the project solution is cloud technology and connecting to internal interfaces will have impact for Security at National Grid.	3	1	3	3	9	Accept	Digital Risk and Security team will need to be involved early in the project discussion.	None	None
2	Risk of Settlement Reporting Failure, Data Corruption, Data Integrity, Data Distribution, Data Reliability and having a Single Data Source.	1	1	3	1	3	Mitigate	Mitigation strategies must be developed and implemented by the project team.	None	None

3.9 Permitting

N/A

3.10 Investment Recovery



US Sanction Paper

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

3.11 Financial Impact to National Grid

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total	
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +		
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24		
INVP 4481	EAS to WAS	+/- 10%	CapEx	0.007	0.779	2.566	0.000	0.000	0.000	0.000	0.000	3.352
			OpEx	0.068	(0.009)	0.127	0.000	0.000	0.000	0.000	0.000	0.186
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.075	0.770	2.693	0.000	0.000	0.000	0.000	0.000	3.538
Total Project Sanction			CapEx	0.007	0.779	2.566	0.000	0.000	0.000	0.000	0.000	3.352
			OpEx	0.068	(0.009)	0.127	0.000	0.000	0.000	0.000	0.000	0.186
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.075	0.770	2.693	0.000	0.000	0.000	0.000	0.000	3.538



US Sanction Paper

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
\$M								
CapEx	0.006	2.110	0.000	0.000	0.000	0.000	0.000	2.116
OpEx	0.068	0.000	0.000	0.000	0.000	0.000	0.000	0.068
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.074	2.110	0.000	0.000	0.000	0.000	0.000	2.184

Variance (Business Plan-Project Estimate)

	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
\$M								
CapEx	(0.001)	1.331	(2.566)	0.000	0.000	0.000	0.000	(1.236)
OpEx	0.000	0.009	(0.127)	0.000	0.000	0.000	0.000	(0.118)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	(0.001)	1.340	(2.693)	0.000	0.000	0.000	0.000	(1.354)

3.11.3 Cost Assumptions

N/A

3.11.4 Net Present Value / Cost Benefit Analysis

This is not a NPV project.

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

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.

Department	Individual	Responsibilities
Meter Data Systems	Catherine McClure	Business Representative
Global Solutions Development	Narayan Devireddy	VP
Global Solutions Development	Jeff Dailey	Director
Business Partner	Prem Singh	VP
IT Finance	Michelle Harris	Director
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director

3.12.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Procurement	Chevere, Diego



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 \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources		0.228	0.228	
	SDC Time & Materials		0.218	0.218	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
	All other personnel	0.184	-	0.184	
TOTAL Personnel Costs	0.184	0.446	0.630		
Hardware	Purchase		-	-	
	Lease		-	-	
Software			1.788	1.788	
Risk Margin			0.287	0.287	
AFUDC			0.161	0.161	
Other			0.672	0.672	
TOTAL Costs		0.184	3.354	3.538	

4.2.2 Benefiting Operating Companies

Operating Company Name	Business Area	State
Niagara Mohawk Power Corp	Transmission	NY
New England Power Company	Transmission	MA



US Sanction Paper

4.2.3 IT Ongoing Operational Costs (RTB):

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

RTB increases are due to new support and hosting cost for the upgraded WSA application, the increase will be partially offset by the decommissioning of both the current WSA and EAS application.

INV ID:	4481					Date RTB Last Forecasted	10/17/2018
Investment Name:	EAS to WSA Migration						
Project Manager:	Jeff Wilson			PDM:	Jeff Dailey		
All figures in \$ thousands	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Total	
	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23		
Last Sanctioned Net Impact to RTB							
Last Sanction IS Net Impact to RTB						-	
Last Sanction Business Net Impact to RTB						-	
Last Sanction Total Net Impact to RTB	-	-	-	-	-	-	
Planned/Budgeted Net Impact to RTB							
IS Investment Plan Net Impact to RTB						-	
Business Budgeted Net Impact to RTB						-	
Currently Forecasted Net Impact to RTB							
IS Funded Net Impact to RTB Forecasted at Go-Live	-	(3.0)	(12.0)	(12.0)	(12.0)	(39.0)	
Business Funded Net Impact to RTB Forecasted at Go-Live	-	35.7	142.8	142.8	142.8	464.1	
Variance to Planned/Budgeted Net Impact to RTB							
IS Investment Plan Net Impact to RTB Variance	-	3.0	12.0	12.0	12.0	39.0	
Business Budgeted Net Impact to RTB Variance	-	(35.7)	(142.8)	(142.8)	(142.8)	(464.1)	

4.3 NPV Summary (if applicable)

N/A

4.4 Customer Outreach Plan

N/A



Closure Paper

Title:	GL Interface CRIS to SAP INVP 4486	Sanction Paper #:	USSC-17-256 V2
Project #:	INVP4486 PFA: S007820	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	2/26/2019
Author:	Richard Malek / Michael Pawlowski	Sponsor:	Jody Allison (VP Billing and Collection Strategy)
Utility Service:	IT	Project Manager:	Richard Malek / Michael Pawlowski

1 Executive Summary

This paper is presented to close INVP4486. The total spend was \$0.814M. The original sanctioned amount for this project was \$1.003M at +/- 10%.

2 Project Summary

This project built an interface between the Customer Revenue Information System (CRIS) and the SAP General Ledger for Account Revenue Adjustments. This interface replaced a manual process of entering General Ledger data into SAP. Implementation of this automated interface resolved a material weakness concern raised by National Grid’s external auditors. A result, the project has reduced human errors and increase the overall accuracy of information entered into the SAP general ledger.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
General Ledger Interface CRIS and SAP	Capex	0.613	0.804	0.191
	Opex	0.201	0.199	(0.002)
	Removal	0.000	0.000	0.000
	Total	0.814	1.003	0.189



Closure Paper

3.2 Cost Variance Analysis

The project cost variance is within tolerance.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	6/22/2018
Actual Ready for Use Date	6/22/2018
Schedule Variance	- 0 years, 0 months, 0 days

3.4 Schedule Variance Explanation

The project was delivered on time and the reduction in costs was due to decrease in scope requested by the business.

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP4486	Capex	0.613	0.804	0.191
	Opex	0.201	0.199	(0.002)
	Removal	0.000	0.000	0.000
	Total	0.814	1.003	0.189

5 Improvements / Lessons Learned/Root Cause

2019-LL-632

Lesson learned - Incorporate knowledge transfer of external systems to allow the test team(s) to cross check results during test. This will help to avoid reliance on the word of external groups as to the validity of test results.

Action – Plan for test team knowledge transfer and training.

2019-LL-633

Lesson Learned - Utilize a single resource with 100% utilization for design activities on complex financial project.



Closure Paper

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Charles Florczyk	Business Representative
BRM	Joel Semel	Relationship Manager
PDM	Michael Pawlowski	Program Delivery Director
IT Finance	Michele Harris	Manager
IT Regulatory	Dan DeMauro	Director
DR&S	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director



Closure Paper

7.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



Closure Template

8 Decisions

I approve this paper.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



Closure Template

Title:	ACIS Infrastructure Upgrade	Sanction Paper #:	
Project #:	INVP 4487 Capex: S007784	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	1/2/2019
Author:	Anthony Bussard	Sponsor:	Fredrick Raymond, VP Project Management
Utility Service:	IT	Project Manager:	Anthony Bussard

1 Executive Summary

This paper is presented to close INVP 4487. The total spend was \$0.192M. The original sanctioned amount for this project was \$0.281M at +/- 10%.

2 Project Summary

The investment provided funding for an infrastructure upgrade to the Automated Contractor Invoicing System (ACIS) used for managing contractor invoicing.

This project was cancelled in March 2018 for two reasons. First, was the budget for the project was transferred for strategic reasons to other higher priority projects. And, second, within the next 3-5 years, ACIS will be replaced by a new contract management system. This would resolve the issues with the current out-of-date infrastructure.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
ACIS Infrastructure Upgrade	Capex	0.000	0.117	0.117
	Opex	0.192	0.164	(0.028)
	Removal	0.000	0.000	0.000
	Total	0.192	0.281	0.089



Closure Template

3.2 Cost Variance Analysis

The project was cancelled during the Requirements and Design phase, so project did incur Opex costs. This project was cancelled in March 2018 for two reasons. First, was the budget for the project was transferred for strategic reasons to other higher priority projects. And, second, within the next 3-5 years, ACIS will be replaced by a new contract management system. This would resolve the issues with the current out-of-date infrastructure. The business accepted the risks related to continuing to use the existing infrastructure until such time ACIS is replaced.

3.3 Schedule Variance Table

N/A

3.4 Schedule Variance Explanation

N/A

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4487	Capex	0.000	0.117	0.117
	Opex	0.192	0.164	(0.028)
	Removal	0.000	0.000	0.000
	Total	0.192	0.281	0.089

5 Improvements / Lessons Learned/Root Cause

2018-LL-628: There was a negative impact to project scope and costs. The new application and database servers would not support a simple migration of the ACIS application and associated databases since the existing .NET framework and databases were out-of-date. This resulted in adding scope and costs to cover additional activities including upgrading the .NET framework and Oracle databases. Future mitigation should include identifying all the necessary software/database upgrades during the Estimating and Start-Up phases in order to capture all the necessary costs and activities related to a server upgrade.



Closure Template

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input type="radio"/> Yes <input checked="" type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input type="radio"/> Yes <input checked="" type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

Note: The answers to #1, #2 and #6 are either “No” or “N/A” is because the project was cancelled.

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Carol Hamilton	Business Representative
BRM	Prem Singh	Relationship Manager
PDM	Michelle McNaught	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Tom Gill	Manager
DR&S	Marc Mandell	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Svetlana Lyba	Manager



Closure Template

7.2 Reviewers

N/A

8 Decisions

The US ITSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

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

Premjith Singh,
VP IT Tower Lead, Gas Business Partner



US Sanction Paper

Title:	US Office 365 ICE Replacement	Sanction Paper #:	USSC-17-154
Project #:	INVP 4491	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	April 12, 2017
Author:	Paul Cudby	Sponsor:	John Gilbert, Global Head IS Service Delivery
Utility Service:	IS	Project Manager:	Zakariyya Ahmedabadi

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4491 in the amount \$4.291M with a tolerance of +/- 10% for the purposes of Full implementation

This sanction amount is \$4.291M broken down into:

- \$3.316M Capex*
- \$0.974M Opex*
- \$0.000M Removal*

1.2 Project Summary

This investment is required to replace the current Instant Messaging, Collaboration, and Email (ICE) services with a set of similar, or enhanced, services provided by Office 365. Office 365 will provide a more effective collaboration and email service (Microsoft Office 365) to meet the business demand for additional capabilities (eg: collaboration with external parties) and provide any enabling infrastructure technology necessary before the ICE service contract expires.

1.3 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
INVP 4491	Project Type	Office 365 US	4.291
Total			4.291

1.4 Associated Projects

N/A

1.5 Prior Sanctioning History

N/A



US Sanction Paper

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
Jun 2018	Project closure

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	The IS Leadership Team have signed off and approved the Global Strategy to implement Office 365 as the preferred solution to replace the current Instant Messaging, Collaboration and Email services

1.8 Asset Management Risk Score

Asset Management Risk Score: 34

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: 25

1.10 Process Hazard Assessment

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

- Yes
 No



US Sanction Paper

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 FY2018-22	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> NA	\$0.000M

1.12 If cost is not aligned with approved Business Plan how will this be funded?

N/A

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2017/18	Yr. 2 2018/19	Yr. 3 2019/20	Yr. 4 2020/21	Yr. 5 2021/22	Yr. 6 + 2022/23	
CapEx	0.000	3.316	0.000	0.000	0.000	0.000	0.000	3.316
OpEx	0.000	0.974	0.000	0.000	0.000	0.000	0.000	0.974
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	4.291	0.000	0.000	0.000	0.000	0.000	4.291

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	Jan 2017
Begin Requirements and Design	Apr 2017
Full Sanction	Apr 2017
Begin Development and Implementation	Aug 2017
Move to Production / Last Go Live	Mar 2018
Project Complete	Apr 2018
Project Closure Sanction	Jun 2018



US Sanction Paper

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)

1	Network Infrastructure - VStig upgrade needs to deliver required bandwidth capacity including the upgrade of existing Proxy servers
2	Microsoft Enterprise License Agreement need to be renewed in time to prevent delays to delivery timelines
3	Transformation of users from XP to Windows 7

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

N/A



US Sanction Paper

2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on April 12, 2017:

- (a) APPROVED this paper and the investment of \$4.291M and a tolerance of +/-10%.
- (b) NOTED the RTB reduction of \$0.857M (per annum) for 5 years.
- (c) NOTED that Zakarry Ahmedabadi has the approved financial delegation.

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

Christopher Kelly
Senior Vice President, Electric Process & Engineering
US Sanctioning Committee Co – Chair Person



US Sanction Paper

3 Sanction Paper Detail

Title:	US Office 365 ICE Replacement	Sanction Paper #:	USSC-17-154
Project #:	INVP 4491	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	April 12, 2017
Author:	Paul Cudby	Sponsor:	John Gilbert, Global Head IS Service Delivery
Utility Service:	IS	Project Manager:	Zakariyya Ahmedabadi

3.1 Background

The way we work internally and interact with our external customers and partners is changing and is driving new requirements for improved collaboration, mobility and user experience.

The current ICE platform cannot support the business demand due to limitations in the current functionality and the inability of the current service to be upgraded. A few of the issues are:

- High risk threats to the service from capacity pressure. On average, an additional 1.5TB to 2TBs of data are being added each month, resulting in us nearing our storage capacity and needing to implement new storage to cope with demand.
- These uplifts in storage as required result in additional effort risk and cost
- The EMC (N.B. this is the branded name of the storage) hardware storage supporting the current service is at end of operational life support from the manufacturer (Dell)
- ICE cannot integrate with Cloud services in an efficient manner. For example, Integrations with Salesforce, EFSS (Enterprise File Sync and Share), success factors, etc.

The existing ICE contract expired in October 2016. It has been extended for another 26 months with an early exit clause. The contract could be extended further if required, but the existing service does not deliver to the business the required capabilities listed below.

- Reliability of the service
- Demand for improved collaboration (including external collaboration)
- Greater mobile device capability
- Enhanced storage capability
- Promoting the “Anytime, Anywhere” working model

The current plan is to gradually move away from ICE by the end of December 2017.



US Sanction Paper

3.2 Drivers

The business drivers for this investment are:

- To ensure the ongoing reliable delivery of the service, as there are issues with the existing service in place
- To meet business demand for improved collaboration (including external collaboration requirements), mobile device capability and “Anytime, Anywhere” working model.

Whilst it is not the main reason for delivering this project, it should be noted that the successful completion and implementation will also deliver a reduction in RTB.

3.3 Project Description

This project will include two key areas of work :

1. Refresh the requirements / gap analysis against Office 365
2. Implementation of Office 365 and migrate users off ICE

This investment will deliver:

- Establish platform and foundation services, for example, ADFS (Active directory Federation Service) and co-existence with ICE
- Implementation of Office 365 capabilities including Exchange, SharePoint Online and Skype for Business (to replace MS Lync on an Instant Messaging basis) and other identified services.
- Migration of all US users and services

In Scope

Office 2010 assessment

- Office 2010 upgrade assessment in scope – Implementation of the upgrade is dependent on the outcome of the assessment

Collaboration and social

- Migrate UK SharePoint 2010 sites to SharePoint Online
- Provide ability for external collaboration with Partners and Suppliers
- Provide ability to access SharePoint sites on mobile devices
- Improved user experience using latest versions of office online

Email and Calendar

- Migrate US Mailboxes and Calendar
- Assessment of pst and archive files during detailed design phase and plan for migration
- Improve/enhance Webmail experience (Exchange Online)
- Increased mail box sizes



US Sanction Paper

- Provide ability to access emails on Mobile devices. (Windows Phones, iOS, and other Android devices)

External Instant Messaging

- Migrate As-Is features of Lync
- Provide ability to use new web version of Skype for Business instead of the current Lync thick client

Cloud storage

Ability to use One Drive– Private cloud storage that can be accessed from any where

Training and Adoption

Adoption requires much more than communication and training. A business change management approach will be run to ensure:

Awareness

- of the need for change
- of the nature of the change

Desire

- To support the change
- To Participate and engage

Knowledge

- On how to change
- On how to implement new skills and behaviours

Ability

- To implement the change
- To demonstrate performance

Reinforcement

- To sustain the change
- To build a culture and competence around change to business processes and use of office 365 capabilities

Operational Support and Monitoring

Delivery of a full support model of the Office 365 services and provide administrative controls, Monitoring and Reporting

Security and Mobile Data Management

Delivery of the capabilities in line with the National Grid DR&S security principles and industry best practice

N.B. The migration scope can be found in the [Appendices](#) section



US Sanction Paper

3.4 Benefits Summary

The project is expected to deliver the following benefits:

Saving in RTB:

- The successful completion and delivery of this project will result in a reduction in RTB

Reliable service provided:

- Enhanced storage capability – Office 365 uses cloud based storage, giving ability to share large files securely, benefitting email and SharePoint services
- Network File Share – E3 licence option gives potential to unlimited storage, increasing collaboration
- Archiving solution – Global information records management (GIRM) has requirements to archive the information as per data protection act and regulations. Office 365 E3 licences provide user friendly and common solution for archiving

New service will provide new capabilities:

- Mobility – Office 365 is designed to support mobility whether by smartphone, tablet or PC
- External collaboration – Office 365 is designed to support external collaboration across all services. This could be supporting instant messaging with our stakeholders, making data in SharePoint available to Joint Venture partners, or collaborating with partners
- Social collaboration – The social collaboration features of Office 365 ensure employees feel more involved leading to improvements in employee engagement
- Agile Task Management – Office 365 has an inbuilt Planner service which eliminates the need to purchase an Agile task Management solution (e.g. Trello)
- Power BI (Business Intelligence) – Opportunity for future savings by exploiting Power BI as a potential strategic reporting tool
- Future Desktop Office Upgrades – E3 licences come with Pro Plus, helping mitigate future upgrade costs of Office 2010
- Potential for future capabilities – Office 365 has many additional features which can be implemented to add further value as required

3.5 Business and Customer Issues

None identified at this stage



US Sanction Paper

3.6 *Alternatives*

Alternative 1: Do Nothing - Practically, there is no do nothing option, the current contract is due to expire at the end of 2018. The current service does not deliver required capabilities, and the infrastructure is set to fail due to capacity issues. DR&S need new functionality on the anti-virus defences entailing a move away from current technology. Rejected

Alternative 2: Replace ICE with Office 365 (All E1 licences) - This option does not align with all business needs and will at some point in near future require to upgrade to E3 licences. Despite the E1 licences being initially cheaper than E3 licences, E1 licence option would entail buying off the shelf solutions for Data Loss Prevention (DLP), Archiving, E-Discovery, etc. Future projects to upgrade Office would also be costlier with E1 option. Rejected

Alternative 3: Replace ICE with Cloud other than Office 365 - Comparable solutions from competitors are not a significant differentiator. However, user adoption and training, migration and magnitude of the change including co-existence will likely be more costly and complex, due to moving to a new technology stack. It will be time consuming and NG will incur high costs both due to maintenance of current aged infrastructure and due to lengthy prospective implementation. Rejected

3.7 *Safety, Environmental and Project Planning Issues*

None at this stage



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	There is a risk of technical or cost limitations based on the discovery phase output of the following services: <ul style="list-style-type: none"> Office 2010 upgrade to Office 2016/Pro-plus All other public shared drives Personal folders (if applicable) to Onedrive Legacy Sharepoint migration (2007/03) Access/Connectivity of any part of the business that is run from offshore 	3	4	4	12	12	Mitigate	Risk margin allowance included within this sanction based on high level assumptions prior to output of discovery phase. Upon discovery assessment output proposal to be presented to Project Board. If cost or schedule impact of including these initiatives are considerable then a follow on phase to the project or re-sanction to cover funding will need to be considered.		
2	There is a risk that D&I phase might be more complex and/or there is a change in requirements causing project schedule slippage	3	2	2	6	6	Mitigate	Risk Margin to cover any additional engagement		
3	Active Directory infrastructure project changes – risk of rework and impact to end users	3	3	2	9	6	Mitigate	Close working between Active Directory and Office 365 projects to ensure a robust business change plan		
4	There is a potential risk that additional bandwidth is required as more Office 365 features/services are introduced	3	2	3	6	9	Mitigate	Network performance reports and validation of network design Staging and phasing the networking upgrade approach during discovery phase. Office 365 project will also be working closely with VStig upgrade plans/project.		
5	A risk that external dependencies could impact on overall migration timescales.	3	1	2	3	6	Accept	The full migration will have dependencies on various external projects and business critical period's/change freeze – e.g. bandwidth increase, BAU patching of clients, year/month end. These will be identified in at the start of the R&D phase and work with the business/projects to identify completion dates and incorporate into plan		
6	Business Maturity for handling the change.	3	1	1	3	3	Accept	Business Change and adoption management workshops will be run across the business		

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

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total	
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +		
INVP 4491	Office 365 US	Est Lvl (e.g. +/- 10%)	CapEx	0.000	3.316	0.000	0.000	0.000	0.000	0.000	0.000	3.316
			OpEx	0.000	0.974	0.000	0.000	0.000	0.000	0.000	0.000	0.974
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	4.291	0.000	0.000	0.000	0.000	0.000	0.000	4.291
Total Project Sanction			CapEx	0.000	3.316	0.000	0.000	0.000	0.000	0.000	0.000	3.316
			OpEx	0.000	0.974	0.000	0.000	0.000	0.000	0.000	0.000	0.974
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	0.000	4.291	0.000	0.000	0.000	0.000	0.000	0.000	4.291

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 +	
CapEx	0.000	3.316	0.000	0.000	0.000	0.000	0.000	3.316
OpEx	0.000	0.974	0.000	0.000	0.000	0.000	0.000	0.974
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	4.291	0.000	0.000	0.000	0.000	0.000	4.291

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 +	
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

3.11.3 Cost Assumptions

- This estimate was developed in 2017 using the standard IS estimating methodology; the accuracy level of estimate is identified in table 3.11.1
- Office 365 implementation will complete before ICE contract expiry in Dec 2018. There will be cost implications if that doesn't happen. Cost implications are unknown at the moment.
- Commercial approach is that the suppliers and partners are engaged on fixed cost basis

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

N/A



US Sanction Paper

3.11.4.2 NPV Assumptions and Calculations

3.11.5 Additional Impacts

N/A

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	John Gilbert
Head of PDM	Tom Cunningham
Relationship Manager	Graham Pool
Program Delivery Manager	Lee Denny
IS Finance Management	Chip Benson
IS Regulatory	Dan DeMauro
DR&S	Elaine Wilson
Service Delivery	Brian Detota
Enterprise Architecture	Joe Clinchot

3.12.2 Reviewers

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

Function	Individual	Area
Regulatory	Zschokke, Peter	All
Jurisdictional Delegate(s)	Harbaugh, Mark	Electric - NY
	Anand, Sonny	Electric - NE
	Hill, Terron	FERC
	Brown, Laurie	Gas - NY
	Currie, John	Gas - NE
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	1.489	
	SDC Time & Materials	-	
	SDC Fixed-Price	-	
	All other personnel	-	
	TOTAL Personnel Costs	1.489	
Hardware	Purchase	-	
	Lease	-	
Software		0.129	
Risk Margin		0.488	
Other		2.186	
TOTAL Costs		4.291	

4.2.2 Benefitting Operating Companies

This project will benefit all the companies listed below.

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



US Sanction Paper

Operating Company Name	Business Area	State
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
New England Hydro Finance Company Inc.	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

Summary Analysis of RTB Costs							
All figures in \$ millions	Yr. 1 17/18	Yr. 2 18/19	Yr. 3 19/20	Yr. 4 20/21	Yr. 5 21/22	Yr. 6+	Total
Forecast of RTB Impact							
RTB if Status Quo Continues	3.892	3.892	3.892	3.892	3.892	3.989	23.447
RTB if Project is Implemented	5.451	2.595	2.376	2.376	2.376	2.435	17.609
Net change in RTB	1.559	(1.297)	(1.516)	(1.516)	(1.516)	(1.553)	(5.838)
RTB Variance Analysis (if Project is Implemented)							
Net Δ RTB funded by Plan(s)	-	-	-	-	-	-	-
Variance to Plan	1.559	(1.297)	(1.516)	(1.516)	(1.516)	(1.553)	(5.838)
Total RTB Costs - by Cost Type (if Project is Implemented)							
App.Sup. - SDC 1	0.240	-	-	-	-	-	0.240
App.Sup. - SDC 2	-	-	-	-	-	-	-
App.Sup. - other	-	-	-	-	-	-	-
SW maintenance	3.121	0.117	-	-	-	-	3.238
SaaS	-	-	-	-	-	-	-
HW support	-	-	-	-	-	-	-
Other: IS	2.089	2.478	2.376	2.376	2.376	2.435	14.131
All IS-related RTB (sub-Total)	5.451	2.595	2.376	2.376	2.376	2.435	17.609
Business Support (sub-Total)	-						
Total RTB Costs	5.451	2.595	2.376	2.376	2.376	2.435	17.609

Note: U.S. Policy dictates that RTB Variance = forecasted Net Δ RTB - Net Δ RTB funded by Investment Plan

4.3 NPV Summary

N/A

4.4 Customer Outreach Plan

N/A

4.5 Migration scope for US

Following is the migration scope for US. Further assessment would be done to determine the metrics of in scope services.

Category	Service	Scope	Action
ICE Platform	Email	Personal folders	Migrate
		Shared mailboxes	Migrate
		US Mailboxes	- Archive non-active Employee mailboxes



US Sanction Paper

			- Migrate active user mailboxes
		PST Archives	Assessment and recommendation on how to migrate user PST archives
		Legal Holds	Migrate legal holds and implement legal hold solution
		SMTP Relays	Continued operation of existing SMTP relays
	SharePoint 2010	Site collections	- Retain Information architecture - Migrate of all site collections
	Lync	All NG Users	- Migrate to 'Skype For business' - Continued hybrid operations
Legacy SharePoint	CNI Sites	Custom applications ¹	Migrate (Assumption) or redevelopment of all applications
	SP Sites	CNI Site collections ²	Migrate
Custom App SharePoint 2013	Custom SharePoint solution		Potentially Migrate (if kept on premise) or Redevelopment

¹ Full analysis not provided – assume an analysis and redevelopment of each application either to SharePoint on Premise (hybrid) or redevelopment using the new app model

² CNI Data may potentially remain on premise due to our security policies

Assess and propose delivery/migration strategy of the following services:

- Office 2010 upgrade to Office 2016/Pro-plus
- All other public shared drives
- Personal folders (if applicable) to Onedrive
- Legacy Sharepoint migration (2007/03)
- Any part of the business that is run from offshore

Implementation of Office 365 will be phased as follows:

1. Core Online – enabling online services (i.e Sharepoint Online) expected to be delivered early on to pilot users
2. Core Hybrid - timescales to be determined as per business readiness plans
3. Deployment Phase - timescales to be determined as per business readiness plans

Each phase will bring in more capabilities of Office 365 while offloading users from ICE.



Closure Paper

Title:	US Video Conference Programme	Sanction Paper #:	
Project #:	INVP 4497	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	10/25/2018
Author:	John Braziel / David McCune	Sponsor:	Steve Maxwell, Global Head of Cloud & Hosting Technologies
Utility Service:	IT	Project Manager:	John Braziel / David McCune

1 Executive Summary

This paper is presented to close INVP 4497 US Video Conference Programme CMR. The total spend was \$0.107M. The original sanctioned amount for this project was \$0.369M at +/- 10% (project grade).

This sanction amount of \$0.369M at +/- 10% is broken down into:

- \$0.205M Capex
- \$0.164M Opex
- \$0.000M Removal

2 Project Summary

The INVP 4497 project replaced the current Verizon OVC (Open Video Conferencing) dedicated video conferencing service with the cloud based WebEx CMR (Collaboration Meeting Room) service. This project intended to achieve a strategic cost savings to reduce the video conference charges that were associated with the previous Verizon OVC service This now provides National Grid’s primary video conferencing capabilities as a unified audio and video conference (VC) service. The use of the Webex CMR now provides for a reduction of video conference charges that are associated with the previous Verizon OVC service, along with flexibility in video meeting attendance from mobile devices or non-traditional locations.



Closure Paper

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
US Video Conference Programme	Capex	0.000	0.205	0.205
	Opex	0.107	0.164	0.057
	Removal	0.000	0.000	0.000
	Total	0.107	0.369	0.262

3.2 Cost Variance Analysis

The project was sanctioned to include hardware purchases which were subsequently cancelled. The hardware was cancelled when it was determined it maybe premature from a technology perspective as the media rich nodes were not yet readily available.

3.3 Schedule Variance Table

N/A

3.4 Schedule Variance Explanation

N/A

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
3901	Capex	0.000	0.205	0.205
	Opex	0.107	0.164	0.057
	Removal	0.000	0.000	0.000
	Total	0.107	0.369	0.262



Closure Paper

5 Improvements / Lessons Learned/Root Cause

2018-LL-150: More time is needed is validate, iterate and finalize requirements for technical details such as:

- Check for variances in technology/equipment that may impact user experience early on. [example: Crestron vs Touch Ten tablet].

2018-LL-151: The roadshows and formal hands on training was needed by the user community in order to make them self sufficient in all aspects of Webex Video conferencing. The roadshows were a successful tool which occurred at Res Woods, Metrotech, Syracuse, Hicksville and Albany.

2018-LL-153: Create a cross-collaborative forum (early on) that includes, vendors, BRMs, CSMs, IPD, Change Management, etc. to plan and test end user engagement activity for all aspects of Webex Video conferencing.

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No



Closure Paper

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Douglas Page	Business Representative
Program Delivery ManagementPDM	Helen Smith	Head of PDM
Business Partner (BP)	Caitlin Davidson	Relationship Manager
Program Delivery Management (PDM)	David McCune	Program Delivery Director
IT Finance	Jess Cheung	Manager
IT Regulatory	Tom Gill	Manager (if Tom Gill)
Digital Risk and Security (DR&S)	Elaine Wilson	Director Security
Service Delivery	Harold Pinkster	Manager
Enterprise Architecture	Joe Clinchot	Director (if Joe Clinchot)

7.2 Reviewers

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

N/A



Closure Paper

8 Decisions

The US ISSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

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

Premjith Singh
VP IS Tower Lead, Ops & Network



Closure Template

Title:	Athena Phase 2	Sanction Paper #:	USSC-16-340C
Project #:	INVP 4529 Capex: S007762	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	10/10/2018
Author:	Richard Pedley	Sponsor:	Elaine Hatzis Head of IS Service Strategy
Utility Service:	IS	Project Manager:	Mark Ashworth / Richard Pedley

1 Executive Summary

This paper is presented to close INVP4529 - Athena Phase 2 also known as Service Now Release 2. The total spend was \$5.144m. The sanctioned amount for this project was \$5.160m at +/- 10%.

2 Project Summary

This investment continued the work started by the Athena Project to provide National Grid with fit for purpose, stable, Service Delivery processes supported by a strategic toolset i.e. ServiceNow, which is a leading product in delivering services across multiple industries. The tools deployed now allow staff to raise IT related incidents, requests for equipment and access to applications via an online portal replacing spreadsheets and less formal request processes. By providing better user focused tools, the reporting by operational teams providing IT services is also much easier to perform. The resulting management information is also allowing National Grid to manage its IT estate more effectively in terms of asset tracking. This data has in turn enhanced National Grid's ability to respond to internal and external audits concerning Sarbanes Oxley (SoX).

The toolset has also been extended to the IT supply chain allowing better and more visible management of IT service incidents and an increase in requests being completed 1st time due to the automation that has been deployed.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over)/ Under
Athena Phase 2	Capex	3.057	0.000	(3.057)
	Opex	2.087	5.160	3.073
	Removal	0.000	0.000	0.000
	Total	5.144	5.160	0.016



Closure Template

3.2 Cost Variance Analysis

During the project the Finance team reassessed the Capex and Opex split of the project based on work carried out and work to be completed. This resulted in a shift from Opex to Capex.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade – Ready for Use Date	31/06/2017
Actual Ready for Use Date	18/09/2017
Schedule Variance	0 years, 2 months, 19 days

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
4529	Capex	3.057	0.000	(3.057)
	Opex	2.087	5.160	3.073
	Removal	0.000	0.000	0.000
	Total	5.144	5.160	0.016

5 Improvements / Lessons Learned/Root Cause

1. A number of end to end design issues were identified later in the solution delivery resulting in change requests. More end to end solution design work across SRM, Incident Management and Portal would have prevented this. KM Ref. 2018-LL-476
2. The project used a number of innovative communication channels which were received well including the use of Yammer and recording video content on priority features. KM Ref. 2018-LL-477
3. The solution architecture of the data solution wasn't sufficiently locked down in the earlier stages of the project and was under estimated in terms of complexity. KM Ref. 2018-LL-478



Closure Template

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IS Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IS Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Ali Fakhouri	Business Representative
PDM	Helen Smith	Head of PDM
BRM	Graham Pool	Relationship Manager
PDM	Richard Pedley	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Daniel DeMauro	Director
DR&S	Satya Kudupudi	Director
Service Delivery	Dave Westwood	Director
Enterprise Architecture	Gareth Harrison	Director



Closure Template

7.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Anand, Sonny
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



Closure Template

8 Decisions

The US Sanctioning Committee (USSC) approved this paper at a USSC meeting held on 09/19/2018.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



Closure: US Sanction Paper

Title:	Rhode Island Renewable Programs Sanction Paper #: USSC-17-363 v3		
Project #:	INVP 4555	Sanction Type:	Closure
Capex #:			
Operating Company:	National Grid USA Svc. Co.	Date of Request:	
Author:	Cruz-Bower, Rziel	Sponsor(s):	McConnachie, Chris Vice President, Finance Services, F
Utility Service:	IT	Project Manager:	Cruz-Bower, Rziel

Executive Summary

Note: The latest sanction amount was M.
 This paper is presented to close INVP 4555. The total spend was \$0.000M. The original sanctioned amount for this project was \$3.676M at +/- 10%.

Project Summary

The State of Rhode Island has passed two laws, RI Law §Chapter 39-26.6 and §Chapter 39-26.4, that will streamline its growing clean energy economy in order to allow virtual net metering, third party financing, and a predictable tax process for commercial systems in host communities. This project will address renewable energy policies with the following workstreams: (1) Shared Solar Renewable Energy Growth; (2) Community Remote Net Metering and (3)Community Regrowth. Workstream (3), Community Regrowth, was removed from the project scope at the request of the Billing Operations business team. The project was concluded early as a result of the removal of Community Regrowth from the scope.

Schedule Variance Table

Schedule Variance	
Project Grade - Ready to use Date	4/30/2019
Actual Ready to use Date	2/22/2019
Schedule Variance	0 year(s), 2 month(s), 7 day(s)

Cost Summary Table

Project Sanction Summary (\$M)			
Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Capex	0.000	3.378	3.378
Opex	0.000	0.298	0.298
Removal	0.000	0.000	0.000
Total	0.000	3.676	3.676

Cost Variance Analysis

Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)			
Project	Breakdown	Total Actual Spend	Variance (Over) / Under
	Capex		3.378
	Opex		0.298
	Removal		0.000
	Total	0.000	3.676

Project Sanction Summary (\$M)

	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Total	Capex	0.000	3.378	3.378
	Opex	0.000	0.298	0.298
	Removal	0.000	0.000	0.000
	Total	0.000	3.676	3.676

Improvements / Lessons Learned

2019-LL-718 - Description :Scope for WS3, Community Regrowth was not defined at the start of the project as this element was evolving with the regulatory agencies. The project was partially sanctioned without clear definition of scope for part of the project. With the removal of this element from the scope, a final sanctioning was not created.

Action - Create a separate project for project elements which do not have clear requirements from regulatory agencies therefore avoiding partial sanctions.

2019-LL-719 - Description: Bill print image had missing elements in production. Changes to the bill print image were not listed as requirements and therefore a test case was not included by the business in the User Acceptance test plan.

Action - Include specific top to bottom review of all bill print images in the creation of the regression test cases.

2019-LL-720 - Description: The business hired extra part time resources to help with the UAT.

Action - Make this a common plan in order to accommodate the large number of test cases.

Closeout Activities

ACTIVITY	COMPLETED
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input type="radio"/> Yes <input type="radio"/> No
All unused material have been returned	<input type="radio"/> Yes <input type="radio"/> No
All as-builts have been completed	<input type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the lesson learned database	<input type="radio"/> Yes <input type="radio"/> No

Statement of Support

Department	Individual	Responsibilities
Business Department		Business Representative
Business Partner (BP)		Relationship Manager
Program Delivery Management (PDM)		Program Delivery Director
IT Finance		Manager
IT Regulatory		Director
Digital Risk and Security (DR&S)		Manager
Service Delivery		Principal Analyst
ARB Verification		
Enterprise Portfolio Management	Cronin, Daniel	Analyst

Reviewers

Function	Individual
Regulatory	Mancinelli, Lauri A.
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Smith, Amy
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego

Decisions

Information Technology Capital

I approve this paper.

Signature _____

Date _____

Christine McClure, Vice President, Finance Business Partner Service Company, USSC Chair

Appendix



US Sanction Paper

Title:	Rhode Island Renewable Programs	Sanction Paper #:	USSC-17-363 v3
Project #:	INVP 4555 Capex: C078581	Sanction Type:	Partial Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	9/11/2018
Author:	Susan Stallard / Rick Malek	Sponsor:	Jody Allison, VP Billing and Collections Strategy
Utility Service:	IS	Project Manager:	Deborah Rollins / Rick Malek

1 Executive Summary

1.1 Sanctioning Summary

This paper requests partial sanction of INVP 4555 in the amount of \$2.230M with a tolerance of +/- 10% for the purposes of completing Development and Implementation (D-I) changes requested for Workstream 1 - Shared Solar and Requirements for Workstream 3 - Community Renewable Energy Growth.

This sanction amount is \$2.230M broken down into:

- \$2.135M Capex*
- \$0.095M Opex*
- \$0.000M Removal*

NOTE the potential investment of \$2.535M with a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of D-I changes requested for Workstream 1 and Requirements for Workstream 3.

1.2 Project Summary

The State of Rhode Island has passed two laws, RI Law §Chapter 39-26.6 and §Chapter 39-26.4, that will streamline its growing clean energy economy in order to allow virtual net metering, third party financing, and a predictable tax process for commercial systems in host communities. This project will address renewable energy policies with the following workstreams: (1) Shared Solar Renewable Energy Growth; (2) Community Remote Net Metering; and (3) Community Renewable Energy Growth.

These Renewable Energy Programs require complex billing capabilities that impact National Grid’s CSS billing system. Each program also has its own distinct rules for participation and allocation of excess energy credits. These programs will use the current customer system account maintenance screens and much of the program/module that has been developed as part of INVP 4124 Automate Remote Net



US Sanction Paper

Metering Project, which was implemented in early 2018. Automating the processes that calculate the complex bills will help ensure accuracy of the customer billing system.

1.3 Summary of Projects

Project Number	Project Title	Estimate Amount (\$M)
INVP 4555	Rhode Island Renewable Programs	2.535
Total		2.535

1.4 Associated Projects

Project Number	Project Title	Estimate Amount (\$M)
4124	Remote Net Metering	3.988
Total		3.988

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
12/12/17	USSC	\$1.180M	\$1.680M	Partial	25%
6/13/17	ISSC	\$0.266M	\$0.898M	Partial	25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
December 2018	Project Sanction



US Sanction Paper

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input checked="" type="radio"/> Mandatory	R.I. Gen. Laws: <ul style="list-style-type: none"> • §Chapter 39-26.6, administered by the Company through the following tariffs approved by the RI Public Utilities Commission (RIPUC): RIPUC No. 2151-E, RIPUC No. 2152-E, and RIPUC No. 2208 (Workstream 1 and Workstream 3). • §Chapter 39-26.4, administered by the Company through the tariff approved by the (RIPUC): RIPUC No. 2178 (Workstream 2).
<input type="radio"/> Policy- Driven	
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

1.8 Asset Management Risk Score

Asset Management Risk Score: 49

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



US Sanction Paper

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 FY19-23	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$0.085M

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

Re-allocation of funds within the US business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements. Future fiscal year forecasts will be addressed in future year business plans.

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
CapEx	0.716	1.639	0.041	0.000	0.000	0.000	0.000	2.396
OpEx	0.094	0.001	0.044	0.000	0.000	0.000	0.000	0.139
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	0.810	1.640	0.085	0.000	0.000	0.000	0.000	2.535



US Sanction Paper

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Start Up	May 2017
Partial Sanction	May 2017
Begin Requirements and Design	June 2017
Begin Development and Implementation – Workstreams 1 & 2	October 2017
Partial Sanction	December 2017
Partial Sanction	September 2018
Begin Development and Implementation – Workstream 1 and Requirements - Workstream 3	September 2018
Project Sanction	December 2018
Begin Design, Development and Implementation – Workstream 3	December 2018
Move to Production / Last Go Live	April 2019
Project Closure	July 2019

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 type="radio"/> Neutral	<input checked="" 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

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$2.230M and a tolerance of +/-10% for the purposes of completion of D-I for Workstream 1 - Shared Solar and Requirements for Workstream 3 - Community Renewable Energy Growth.
- (b) NOTE the potential run-the-business (RTB) impact of \$ 0.002M (per annum) for 5 years.
- (c) NOTE the potential investment \$ 2.535M and a tolerance of +/- 25%, contingent upon submittal and approval of a Project Sanction paper following completion of requirements and design.
- (d) NOTE that Deborah Rollins is the Project Manager and has the approved financial delegation.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	Rhode Island Renewable Programs	Sanction Paper #:	USSC-17-363 v3
Project #:	INVP 4555 Capex: C078581	Sanction Type:	Partial Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	9/11/2018
Author:	Susan Stallard / Rick Malek	Sponsor:	Jody Allison, VP Billing and Collections Strategy
Utility Service:	IS	Project Manager:	Deborah Rollins / Rick Malek

3.1 Background

There are currently two different types of Renewable Energy Programs in Rhode Island. One is referred to as Net Metering and the other is Renewable Energy Growth. Rhode Island passed 2 laws §Chapter 39-26.6 and §Chapter 39-26.4 to streamline the Renewable Energy policies for the state.

The following are the associated Renewable Energy Programs:

- Shared Solar Renewable Energy Growth
- Community Remote Net Metering
- Community Renewable Energy Growth

The three Renewable Energy Programs are described in more detail in Section 3.3.

Currently National Grid’s Billing Operations and Account Maintenance & Operations teams use a manual process to track National Grid customers in the remote net metering programs. These programs include Host customers that generate more electricity than they use, and Satellite customers who will receive a portion of the over-generation. The manual processing of these programs involves maintaining customer spreadsheets, calculating the electric over-generation (kW) and how much electricity (kW) each customer receives, transferring excess dollars or kWh to the customers, and producing the bills. The transferred/allocated kWh is used to calculate a Bill Credit that is applied to the Satellite customer’s bill. Due to the number of customers signing up for Net Metering, the current manual process of billing customers will be automated in this project.

The Automate Net Metering project (INVP 4124) was implemented in early 2018 which supports the automation of National Grid’s net metering programs. The Rhode Island Renewable Program project will be utilizing and building on the complex logic put in place by the Automate Net Metering project.



US Sanction Paper

3.2 Drivers

The primary driver is to ensure that the Company has the capability to effectively comply with the R.I. Gen. Laws:

- §Chapter 39-26.6 and the Company's electric tariffs at RIPUC No. 2151-E, 2152-E, and 2208 for Workstream 1 and Workstream 3; and
- §Chapter 39-26.4 and the Company's electric tariffs at RIPUC No. 2178 for Workstream 2.

The secondary driver is to eliminate the risk of human error in performing manual billing, so this project automates all the billing calculations.

3.3 Project Description

This project will automate the following three Rhode Island Renewable Programs, which are comprised of separate Workstreams:

- The Shared Solar Renewable Energy Growth program
 - Consists of a single generation meter associated with multiple nearby account meters. This program will allow allocation between 2 and 50 satellite accounts. The calculations for the original Renewable Energy Growth program for both the Total Performance Based Incentive (PBI) Payment which is calculated against the Host's generated usage, and the Bill Credit will remain the same except that they will be calculated on the Satellite (at that particular rate). The Bill Credit is calculated on the amount of kWh that is allocated to the Satellite account(s) and then subtracted from the Host's PBI. Each Bill Credit is used to offset the prospective Satellite's kWh charges and reduce the Host account's PBI payment.
- The Community Remote Net Metering program
 - Allows for automated money transfers from the Host to the Satellite Accounts. The transfers will be based on an allocation percentage stored and calculated at the Host level. Although there is no technical limit to the number of Satellite customers associated to the Host, there will be a natural limit based on the size of the Host system.
- The Community Renewable Energy Growth program
 - Allows the allocation from a minimum of 3 with no maximum limit of Satellite accounts. Like the original Renewable Energy Growth program, the PBI payment will still be calculated against the Host's generated usage. The Bill Credits, however, will be calculated at the Satellite level using a single contract price.



US Sanction Paper

3.4 Benefits Summary

Automating the process for calculating the complex Renewable Energy Program bills will help ensure accuracy in the customer billing system.

3.5 Business and Customer Issues

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

3.6 Alternatives

Alternative 1: Do Nothing/Defer

Doing nothing or deferring the work is not a viable option, as National Grid would be out of compliance with Rhode Island law and the Company’s tariffs approved by the RIPUC.

3.7 Safety, Environmental and Project Planning Issues

All National Grid safety and environmental rules will be followed.

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	Future changes to regulatory requirements pertaining to the project can impact the project scope, schedule and cost.	3	3	3	9	9	Accept	Implementing Agile methodology and working closely with business		Work closely with regulatory groups to quickly asses impact of new requirements to the project. As changes are identified, impacts need to be assessed in terms of Cost, Time and Resources.
2	The project is divided in multiple workstreams. There is a risk that due to cross impacts between workstreams, timelines and resources for the individual workstream might be impacted.	2	2	2	4	4	Mitigate	Add or replace resources as required to meet the schedule.		During Design phase for each workstream establish impacts to other workstream(s) for timeline and resources and make necessary adjustments.

3.9 Permitting

N/A



US Sanction Paper

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Recovery is currently occurring for past and current costs of this project, and will be proposed, through the RE Growth Recovery Factor as work progresses.

3.10.2 Customer Impact

N/A

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 Level (%)	Spend (\$M)	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
INVP 4555	Rhode Island Renewable Programs	+/- 10%	CapEx	0.716	1.639	0.041	0.000	0.000	0.000	0.000	2.396
			OpEx	0.094	0.001	0.044	0.000	0.000	0.000	0.139	
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
			Total	0.810	1.640	0.085	0.000	0.000	0.000	2.535	

3.11.2 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
CapEx	0.716	1.639	0.000	0.000	0.000	0.000	0.000	2.355
OpEx	0.094	0.001	0.000	0.000	0.000	0.000	0.000	0.095
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.810	1.640	0.000	0.000	0.000	0.000	0.000	2.450

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
CapEx	0.000	(0.000)	(0.041)	0.000	0.000	0.000	0.000	(0.041)
OpEx	(0.000)	0.000	(0.044)	0.000	0.000	0.000	0.000	(0.044)
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	(0.085)	0.000	0.000	0.000	0.000	(0.085)



US Sanction Paper

3.11.3 Cost Assumptions

This estimate was developed in 2018 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

3.11.4.1 NPV Summary Table

N/A

3.11.4.2 NPV Assumptions and Calculations

N/A

3.11.5 Additional Impacts

N/A

3.12 Statements of Support

3.12.1 Supporters

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

Department	Individual	Responsibilities
Revenue Cycle Management	Jody Allison	Business Representative
Program Delivery Management	Deborah Rollins	Head of PDM
Business Relationship Management	Joel Semel	Relationship Manager
Program Delivery Management	Riziel Cruz-Bower	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Dan DeMauro	Director
Digital Risk & Security	Elaine Wilson	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joseph Clinchot	Director



US Sanction Paper

3.12.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - FERC	Hill, Terron
Procurement	Chevere, Diego



US Sanction Paper

4 Appendices

4.1 Sanction Request Breakdown by Project

\$M	INVP 4555	Total
CapEx	2.135	2.135
OpEx	0.095	0.095
Removal		0.000
Total	2.230	2.230

4.2 Other Appendices

4.2.1 Project Cost Breakdown

Project Cost Breakdown \$ (millions)					
Cost Category	sub-category	VOWD	FTC	FAC=VOWD+FTC	Name of Firm(s) providing
Personnel	NG Resources	0.121	0.007	0.128	
	SDC Time & Materials	1.090	0.552	1.642	IBM
		0.000	-	-	WiPro
		0.000	-	-	DXC
		0.000	-	-	Verizon
	SDC Fixed-Price	0.000	-	-	IBM
		0.000	-	-	WiPro
		0.000	-	-	DXC
		0.000	-	-	Verizon
	All other personnel	0.162	0.273	0.435	
TOTAL Personnel Costs	1.373	0.832	2.205		
Hardware	Purchase	0.000	-	-	
	Lease	0.000	-	-	
Software		0.000	-	-	
Risk Margin			0.149	0.149	
AFUDC		0.030	0.123	0.153	
Other		0.015	0.012	0.027	
TOTAL Costs		1.418	1.117	2.535	Should match Financial Summary Total

4.2.2 Benefiting Operating Companies

The following is the benefiting operating company:

Operating Company Name	Business Area	State
The Narragansett Electric Company	Electric Retail	RI



US Sanction Paper

4.2.3 Operational Costs (RTB)

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

all figures in \$ thousands						
INV ID:	INVP 4555				Forecast Date:	
Investment Name:	RI Renewable				Go-Live Date:	
Project Manager:	Rick Malek			PDM:	Deborah Rollins	
All figures in \$ thousands	Yr. 1 FY 18/19	Yr. 2 FY 19/20	Yr. 3 FY 20/21	Yr. 4 FY 21/22	Yr. 5 FY 22/23	Total
Last Sanctioned Net Impact to RTB						
Last Sanction IS Net Impact to RTB						-
Last Sanction Business Net Impact to RTB						-
Last Sanction Total Net Impact to RTB	-	-	-	-	-	-
Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB						-
Business Budgeted Net Impact to RTB						-
Currently Forecasted Net Impact to RTB						
IS Funded Net Impact to RTB Forecasted at Go-Live	0.5	2.0	2.0	2.0	2.0	8.5
Business Funded Net Impact to RTB Forecasted at Go-Live	-	-	-	-	-	-
Variance to Planned/Budgeted Net Impact to RTB						
IS Investment Plan Net Impact to RTB Variance	(0.5)	(2.0)	(2.0)	(2.0)	(2.0)	(8.5)
Business Budgeted Net Impact to RTB Variance	-	-	-	-	-	-

4.3 NPV Summary (if applicable)

N/A

4.4 Customer Outreach Plan

N/A



US Sanction Paper

Title:	US SAP: FERC on HANA upgrade	Sanction Paper #:	USSC-18-247 v2
Project #:	INVP 4563 Capex: S007900	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/5/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Alejandro.Mango, VP Finance Excellence
Utility Service:	IT	Project Manager:	Samir Parikh

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of INVP 4563 in the amount of \$3.878M with a tolerance of +/- 10% for the purposes of Development and Implementation.

This sanction amount is \$3.878M broken down into:

\$2.993M Capex
\$0.885M Opex
\$0.000M Removal

1.2 Project Summary

This project delivers an upgrade for National Grid’s FERC on HANA (FOH) tool. Electric and gas utilities must comply with the Uniform System of Accounts from the Federal Energy Regulatory Commissions (FERC) or the National Association of Regulatory Utility Commissioners (NARUC). National Grid uses FERC on HANA to meet compliance requirements, such as filing reports and responding to data requests. To maintain compliance and remain current, National Grid must upgrade the FERC on HANA application.

1.3 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
INVP 4563 Capex: S007900		US SAP: FERC on HANA upgrade	3.878
Total			3.878



US Sanction Paper

1.4 Associated Projects

N/A

1.5 Prior Sanctioning History

Date	Governance Body	Sanctioned Amount	Potential Project Investment	Sanction Type	Potential Investment Tolerance
7/26/18	USSC	\$0.724M	\$2.839M	Partial Sanction	+/- 25%

1.6 Next Planned Sanction Review

Date (Month/Year)	Purpose of Sanction Review
January 2020	Project Closure Sanction

1.7 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input checked="" type="radio"/> Other	This project will ensure that FERC on HANA is in compliance with required level of updates provided by SAP to stay in support from the vendor to ensure that National Grid will leverage latest SAP corrections and notes that have been released in the past. In addition, as per contract FR-RTR-23-HANA-SAP-202, National Grid has an obligation to keep the solution up-to-date so that SAP can provide the required level of support of our custom solution.

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



US Sanction Paper

1.9 Complexity Level

High Complexity Medium Complexity Low Complexity N/A

Complexity Score: 19

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 (\$)
IT Investment Plan FY20 – 24	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	1.691M

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

Re-allocation of budget within the IT business has been managed to meet jurisdictional budgetary, statutory and regulatory requirements.

1.13 Current Planning Horizon

\$M	Prior Yrs	Current Planning Horizon						Total
		Yr. 1 2019/20	Yr. 2 2020/21	Yr. 3 2021/22	Yr. 4 2022/23	Yr. 5 2023/24	Yr. 6 + 2024/25	
CapEx	1.492	1.501	0.000	0.000	0.000	0.000	0.000	2.993
OpEx	0.695	0.190	0.000	0.000	0.000	0.000	0.000	0.885
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	2.187	1.691	0.000	0.000	0.000	0.000	0.000	3.878



US Sanction Paper

1.14 Key Milestones

Milestone	Target Date: (Month/Year)
Partial Sanction	June 2018
Begin Requirements and Design (including RFP)	June 2018
Project Sanction	March 2019
Begin Development and Implementation	March 2019
Move to Production / Last Go Live	August 2019
Project Closure	January 2020

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

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



US Sanction Paper

1.18 List References

N/A



US Sanction Paper

2 Decisions

I:

- (a) APPROVE this paper and the investment of \$ 3.878M and a tolerance of +/-10% for the purposes of Development and Implementation.

- (c) NOTE that Sameer Parikh is the Project Manager and has the approved financial delegation.

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

David H. Campbell, Vice President ServCo Business Partnering, USSC Chair



US Sanction Paper

3 Sanction Paper Detail

Title:	US SAP: FERC on HANA upgrade	Sanction Paper #:	USSC-18-247 v2
Project #:	INVP 4563 Capex: S007900	Sanction Type:	Sanction
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/5/2019
Author / NG Representative:	Anil Garg / Ella Weisbord	Sponsor:	Alejandro.Mango, VP Finance Excellence
Utility Service:	IT	Project Manager:	Samir Parikh

3.1 Background

This project delivers an upgrade for National Grid’s FERC on HANA (FOH) application. National Grid’s FOH Solution is a fully customized module that was implemented in National Grid by SAP in the SIMPLE Finance Application (SFin), Version 15.03. The supporting database is HANA1 on SPS11 Rev 112.07. The FOH is receiving data from SAP ERP Central Component (ECC) via SLT (SAP Landscape Transformation Replication Server) in SAP HANA.

National Grid uses FERC on HANA to meet compliance requirements, such as filing reports and responding to data requests. To maintain compliance and remain current, National Grid must upgrade the FERC on HANA application.

The team will review SAP HANA maintenance strategy and National Grid business priorities and will decide what would be the efficient delivery strategy to upgrade and enhance the FERC on Hana solution. The proposed delivery should leverage the most up-to-date upgrades, apply all known SAP’s notes and corrections and keep the version of the application in the right level.

3.2 Drivers

The primary driver is to ensure the FERC on HANA tool is compliant with the latest FERC requirements and with the vendor’s (SAP) support policies. This project will also address known replication issues with existing FOH version.



US Sanction Paper

3.3 Project Description

As part of this project, the following activities will be implemented:

- Successfully build, configure, test and deploy new FERC on HANA project environment as per the approved design
- Successfully upgrade National Grid's FERC on HANA (FOH) application
- Testing of the interfaces in scope
- Testing of end-to-end system connectivity and solution setup
- Perform End to End Testing before go-live
- Change Management & Training support
- Roll out the upgraded FERC on HANA solution
- Complete Service Transition into production

3.4 Benefits Summary

This project will ensure National Grid's compliance with FERC requirements, leverage available changes from SAP, address existing replication issues and allow the module to stay in support with vendor.

3.5 Business and Customer Issues

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

3.6 Alternatives

Alternative 1: Defer project / Do Nothing

Rejected: This option will not address the need to stay in compliance with FERC requirements and address existing issues.

Indicative Cost: N/A

3.7 Safety, Environmental and Project Planning Issues

There are no significant issues beyond what has been described in this paper.



US Sanction Paper

3.8 Execution Risk Appraisal

Risk Breakdown Structure Category	Qualitative Assessment / Risk Response Strategy				Risk Score	
	Risk ID + Title	IF Statement	THEN Statement	Risk Response Strategy		
18. Specific Risk	R1 - Solution Complexity	Complexity of Solution with 3 major components to be addressed - FERC Software module with data implication - FERC Platform and dependencies - BI Platform and dependencies	The Project Schedule may be impacted negatively	Accept	Project Manager, with the support of Business Leads, will monitor and manage the situation.	20
18. Specific Risk	R2 - Limited SME Availability	Limited availability of SME on FERC Module and new functionality on SFIN upgrade (Documentation not available) - FERC was 100% custom module developed for NG - Detailed analysis of existing module and SFIN Version 1709 is required - Detailed analysis of data flow and reporting model is required	The Project Schedule may be impacted negatively	Reduce	Project Manager will address during RFP process	16
18. Specific Risk	R3 - Co-ordination with Other Projects / Initiatives	Lack of coordination among different initiatives in IT a. Move the DATA Center b. Building new Environments c. Data Loads in Sync d. Data Enhancements in Sync e. Regression Test	The completion of project activities may be delayed	Share	Project Manager will coordinate with all involved parties	10
13. Project Management	R4 - Co-ordination with Multiple Project Vendors	Lack of coordination between multiple vendors on the preparedness of the platform(s) and Software / Data Flow Enhancements	The completion of project activities may be delayed	Accept	This is an expected situation, Project Manager will work with vendors involved	8

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

3.11 Financial Impact to National Grid



US Sanction Paper

3.11.1 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend (\$M)	Prior Yrs	Current Planning Horizon						Total		
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +			
					2019/20	2020/21	2021/22	2022/23	2023/24	2024/25			
INVP 4563 Capex: S007900	US SAP: FERC on HANA upgrade	+/- 10%	CapEx	1.492	1.501	0.000	0.000	0.000	0.000	0.000	0.000	2.993	
			OpEx	0.695	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.885
			Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			Total	2.187	1.691	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.878

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 +	
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
CapEx	1.492	0.000	0.000	0.000	0.000	0.000	0.000	1.492
OpEx	0.695	0.000	0.000	0.000	0.000	0.000	0.000	0.695
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	2.187	0.000	0.000	0.000	0.000	0.000	0.000	2.187

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 +	
		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	
CapEx	0.000	(1.501)	0.000	0.000	0.000	0.000	0.000	(1.501)
OpEx	0.000	(0.190)	0.000	0.000	0.000	0.000	0.000	(0.190)
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	(1.691)	0.000	0.000	0.000	0.000	0.000	(1.691)

3.11.3 Cost Assumptions

This estimate was developed using the standard IT estimating methodology which includes an assessment of project resource needs, including hardware, software, internal and contract labor required to deliver the project. The accuracy level of estimate for the project is identified in table 3.11.1.

3.11.4 Net Present Value / Cost Benefit Analysis

3.11.4.1 NPV Summary Table

This is not an NPV project.



US Sanction Paper

3.11.4.2 NPV Assumptions and Calculations

N/A

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.

Department	Individual	Responsibilities
Finance Technology Enablement	William Donoghue	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Samir Parikh	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Daniel DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Director
Enterprise Architecture	Joe Clinchot	Director

3.12.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
Jurisdictional Delegate - Electric NE	Easterly, Patricia
Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



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 \$ (millions)					
Cost Category	sub-category	Value of Work to Date (VOWD)	Forecast to Complete (FTC)	Forecast At Completion (FAC=VOWD+FTC)	Name of Firm(s) providing resources
Personnel	NG Resources		0.375	0.375	
	SDC Time & Materials		-	-	IBM
			0.100	0.100	WiPro
			-	-	DXC
			-	-	Verizon
	SDC Fixed-Price		-	-	IBM
			-	-	WiPro
			-	-	DXC
			-	-	Verizon
		All other personnel		2.753	2.753
	TOTAL Personnel Costs	-	3.229	3.229	
Hardware	Purchase		-	-	
	Lease		-	-	
Software			-	-	
Risk Margin			0.328	0.328	
AFUDC			0.094	0.094	
Other			0.227	0.227	
	TOTAL Costs	-	3.878	3.878	



US Sanction Paper

4.2.2 Benefiting Operating 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
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
New England Electric Trans Corp	InterConnector	MA

4.2.3 IS Ongoing Operational Costs (RTB):

This project will not change IT ongoing operations support costs. These are also known as Run the Business (RTB) costs.

4.3 NPV Summary (if applicable)

N/A



US Sanction Paper

4.4 Customer Outreach Plan

N/A



Closure Paper

Title:	Software Defined Networking Enablement F&A	Sanction Paper #:	
Project #:	INVP 4575 Capex: S007577	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	10/25/2018
Author:	Ginelle Davidson	Sponsor:	John Gilbert Global Head ID Service Delivery
Utility Service:	IS	Project Manager:	Ginelle Davidson

1 Executive Summary

This paper is presented to close INVP 4575. The total spend was \$0.256M. The original sanctioned amount for this project was \$0.487M at +/- 10%.

2 Project Summary

This project was part of the Technology Improvement Program under INVP 4665 System Communications and Upgrade. Software Defined Networking Enablement (SD WAN) is an approach to computer networking that offers several benefits compared to traditional router-based networks. This project was to the SD WAN strategy and design, the initial hard ware purchase for four US locations as well as the implementation and completion of the Proof of Concept at four US locations.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over)/ Under
Software Defined Networking Enablement F&A	Capex	0.000	0.486	0.486
	Opex	0.256	0.001	(0.255)
	Removal	0.000	0.000	0.000
	Total	0.256	0.487	0.231

3.2 Cost Variance Analysis

The project cost variance is due to the cancellation of the project after the completion of the strategy and design phase only.



Closure Paper

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	9/30/2017
Actual Ready for Use Date	N/A
Schedule Variance	Project Cancelled

3.4 Schedule Variance Explanation

The schedule variance is N/A as the project was cancelled and not completed.

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over)/ Under
4575	Capex	0.000	0.486	0.486
	Opex	0.256	0.001	(0.255)
	Removal	0.000	0.000	0.000
	Total	0.256	0.487	0.231

5 Improvements / Lessons Learned/Root Cause

1. 2018-LL-521 Significant delay in closure due to supplier invoices being significantly delayed.



Closure Paper

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IS Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IS Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	Doug Page	Business Representative
PDM	Helen Smith	Head of PDM
BRM	Brian Detota	Relationship Manager
PDM	Chris Granata	Program Delivery Director
IS Finance	Michelle Harris	Manager
IS Regulatory	Dan Demauro	Director (if Dan Demauro) Manager (if Tom Gill)
DR&S	Elaine Wilson	Director (if Elaine Wilson) Manager (if other)
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director (if Joe Clinchot) Manager (if other)



Closure Paper

7.2 Reviewers
N/A



Closure Template

8 Decisions

The US ISSC Sanctioning Committee and Executive Sponsor has reviewed and approved this paper.

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

Premjith Singh
VP IS Tower Lead, Ops & Network



Closure Paper

Title:	Data Visualization Expansion	Sanction Paper #:	USSC-17-299C
Project #:	INVP 4606 CapEx: S007728	Sanction Type:	Closure
Operating Company:	National Grid USA Svc. Co.	Date of Request:	3/26/2019
Author / NG Representative:	Anil Garg / Suresh Muthiravilayil	Sponsor:	John Gilbert, Global Head IS Service Delivery
Utility Service:	IT	Project Manager:	Jeffrey Dailey

1 Executive Summary

This paper is presented to close INVP 4606. The total spend was \$3.200M. The original sanctioned amount for this project was \$3.815M at +/- 10%.

2 Project Summary

Building upon the success of the Data Visualization (Tableau) core implementation in 2017, this investment expanded the use of Tableau with additional data and analytics capabilities. Data Visualization was extended with the build out of dashboards across more business areas in support of their reporting, data retention and regulatory obligations. In addition to enhanced data access, this investment provided more advanced analytics through the use of new tools and longer term storage of information within the environment for audit and trending. The investment introduced additional dashboards within Finance, Customer and Operations to support reporting requirements.

3 Variance Analysis

3.1 Cost Summary Table

Project Sanction Summary (\$M)				
Title	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
Data Visualization Expansion	Capex	3.170	3.585	0.415
	Opex	0.030	0.230	0.200
	Removal	0.000	0.000	0.000
	Total	3.200	3.815	0.615

3.2 Cost Variance Analysis

Following factors contributed to favorable variance:



Closure Paper

- a. Overall reduced license costs - Project negotiated and procured licenses at discounted rates.
- b. Overall reduced # of licenses procured - Licenses were managed efficiently within the project team and business users.
- c. Lower than anticipated internal resource costs.

3.3 Schedule Variance Table

Schedule Variance	
Project Grade - Ready for Use Date	6/29/2018
Actual Ready for Use Date	7/11/2018
Schedule Variance	0 years, 0 months, 12 days

3.4 Schedule Variance Explanation

N/A

4 Final Cost by Project

Actual Spending (\$M) vs. Sanction (\$M)				
Project	Breakdown	Total Actual Spend	Original Project Sanction Approval	Variance (Over) / Under
INVP 4606 Capex: S007728	Capex	3.170	3.585	0.415
	Opex	0.030	0.230	0.200
	Removal	0.000	0.000	0.000
	Total	3.200	3.815	0.615

5 Lessons Learned

- 2019-LL-647: Lack of complete knowledge of reliable data flows across applications and business groups leading to multiple iterations of data validation. Engage early to capture, validate and document dataflows across applications and business groups.



Closure Paper

6 Closeout Activities

The following closeout activities have been completed.

Activity	Completed
All work has been completed in accordance with all National Grid policies	<input checked="" type="radio"/> Yes <input type="radio"/> No
Gate E checklist completed (appl. only to CCD)	<input type="radio"/> Yes <input checked="" type="radio"/> N/A
All relevant costs have been charged to project	<input checked="" type="radio"/> Yes <input type="radio"/> No
All work orders and funding projects have been closed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All unused materials have been returned	<input checked="" type="radio"/> Yes <input type="radio"/> No
All IT Service Transition activities have been completed	<input checked="" type="radio"/> Yes <input type="radio"/> No
All lessons learned have been entered appropriately into the IT Knowledge Management Tool (KMT) lesson learned database	<input checked="" type="radio"/> Yes <input type="radio"/> No

7 Statements of Support

7.1 Supporters

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

Department	Individual	Responsibilities
Business Department	John Gilbert	Business Representative
Business Partner (BP)	Joel Semel	Relationship Manager
Program Delivery Management (PDM)	Jeffrey Dailey	Program Delivery Director
IT Finance	Michelle Harris	Manager
IT Regulatory	Dan DeMauro	Director
Digital Risk and Security (DR&S)	Peter Shattuck	Director
Service Delivery	Mark Mirizio	Manager
Enterprise Architecture	Joe Clinchot	Director



Closure Paper

7.2 Reviewers

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

Function	Individual
Regulatory	Harvey, Maria
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Jurisdictional Delegate - Electric NY	Harbaugh, Mark A.
Jurisdictional Delegate - FERC	Hill, Terron
Jurisdictional Delegate - Gas NE	Currie, John
Jurisdictional Delegate - Gas NY	Wolf, Don
Procurement	Chevere, Diego



Closure Paper

8 Decisions

I approve this paper.	
Signature.....	Date.....
David H. Campbell, Vice President ServCo Business Partnering, USSC Chair	