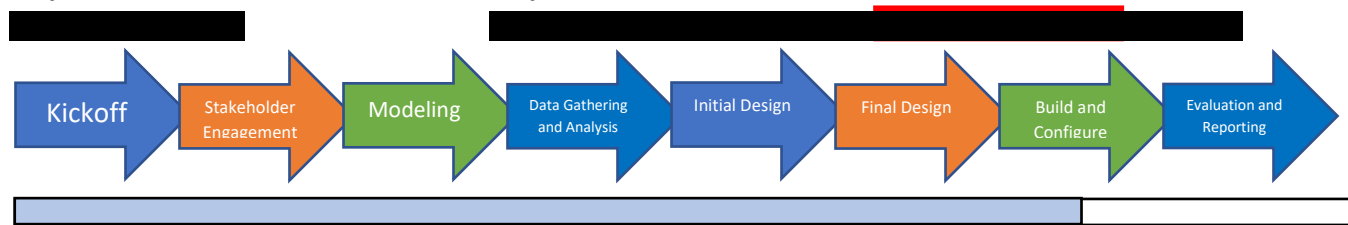


**Project Start Date:** 10/01/2015

**Project End Date:** 12/31/2020



**Project Summary:** The FICS demonstration project aims to test a new model for interconnection of DERs to the utilities' distribution systems. The new model uses Active Network Management to interconnect DERs to the grid using "flexible" capacity instead of using conventional firm capacity reinforcement. The flexible capacity model aims to reduce DER interconnection costs and aid economic viability. The companies are currently pursuing two ANM schemes in the NYSEG and RG&E service territories.

**Recent Lessons learned:**

- **The Customer**
  - It can take a developer years to complete construction, testing, commissioning of a project site after being approved for interconnection
- **The Market**
  - Developers are very willing to reduce the interconnection costs of a project in exchange for minimal projected curtailment

**Application of lessons learned:** NYSEG and RG&E plans to pursue integration of FICS solutions into its business-as-usual interconnection process following the completion of this demo project.

**Explanation for over budget:** This project has exceeded its originally forecasted budget due to the significant delays in permitting with DER #1 and the cancellation of other DERs that we have pursued as FICS candidates. These delays and cancellations have led to increased expenditures on external services for managing the project and identifying additional FICS sites.

**Recent Issues Identified:**

**Solutions Identified:**

**Recent Milestones/Targets Met:**

- Detailed design of the FICS field communication architecture was completed for DERs #1,5,6 and 7
- Design for the communications pathway from Companies' SCADA system to the ANM Strata servers was completed

**Upcoming Milestones/Targets:**

- Develop Operator Training and Operating Instructions for DERs #5-7
- Perform FAT and Pre-Production Testing on ANM Strata system
- Build and configure communications pathway from ANM Strata system to the Companies' SCADA system
- Configure ANM Elements for DERs #5-7
- Finalize contract language for FICS solution for DERs #5-7
- Execute contract between RG&E and the Developer/Owner of DERs #5-7
- Finalize quote and bill the developer for the cost of the FICS solution for DERs #5-7

## **Reforming the Energy Vision**

Demonstration Project Q2 2020 Report

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# **Flexible Interconnect Capacity Solution**



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## 1.0 Executive Summary

New York State Electric & Gas Corporation (NYSEG) and Rochester Gas and Electric Corporation (RG&E) (and together, the Companies) submits this quarterly report on the progress of the Flexible Interconnect Capacity Solutions (FICS) demonstration project. The FICS demonstration project tests a new model for interconnecting Distributed Energy Resources (DERs) to the distribution grid using Active Network Management (ANM) rather than firm capacity. ANM technology allows the utility to manage DER within grid constraints (e.g., voltage, thermal, etc.) using real-time sensing and controls rather than performing more expensive system modifications. This model provides the potential to save on the time to interconnect and interconnection costs with minimal curtailment of the DER, aiding economic viability. In addition, ANM provides the potential to allow for greater levels of DER penetration.

Two proposed ANM schemes in the NYSEG and RG&E service territory have been targeted as the demonstration sites for the initial FICS scope. Using ANM, a portion of the interconnection costs for each DER will be deferred by managing network constraints identified in NYSEG's interconnection analysis. The DERs include one (1) - 2 MW (hereafter DER #1) and three (3) - 5 MW solar photovoltaic (PV) farms (hereafter DER#5-7).

During Q2 2020, the detailed design of the FICS field communication architecture for DERs #1, 5, 6, and 7 was completed. The design for the communications pathway from the Companies' SCADA system to the ANM Strata servers was also completed. Negotiations of contract language in the ANM Agreements for DERs #5-7 were continued during Q2 2020 and are ongoing. Detailed design regarding communications backhaul, cybersecurity, and integration of the ANM head-end system with NYSEG's Supervisory Control and Data Acquisition (SCADA) system continued for implementation at DER #1.

The Companies also continued working to formulate the appropriate contract language (operation, ownership, and maintenance responsibilities) as well as developing a quote for the incremental cost for the FICS solution for DERs #5-7.

Assuming the COVID-19 pandemic will not negatively impact the progress, plans for Q3 2020 include:

- Develop Operator Training and Operating Instructions for DERs #5-7
- Perform FAT and Pre-Production Testing on ANM Strata system
- Build and Configure communications pathway from ANM Strata system to the Companies' SCADA system
- Configure ANM Elements for DERs #5-7
- Finalize contract language for FICS solution for DERs #5-7
- Execute contract between RG&E and the Developer/Owner of DERs #5-7
- Finalize quote and bill the developer for the cost of the FICS solution for DERs #5-7

The following report provides a progress update on the tasks, milestones, checkpoints, and lessons learned to date.

## 2.0 Demonstration Highlights

### 2.1 Activity Overview

As of the end of Q2 2020, nine proposed interconnection projects have been formally considered for implementation of a FICS solution. The projects along with their size, type, interconnecting utility, and their current FICS status have been identified in Table 1 below.

Project #	Size (MW)	Type	Interconnecting Utility	Current Status
DER #1	2.00	Solar PV Generator	NYSEG	FICS chosen (Under Construction); Final Acceptance Received 12/23/2019
DER #2	0.45	Farm Waste Generator	NYSEG	Removed due to inactivity.
DER #3	1.70	Solar PV Generator	NYSEG	Project withdrawn by developer
DER #4	2.00	Solar PV Generator	NYSEG	Removed due to inactivity.
DER #5	5.00	Solar PV Generator	RG&E	FICS chosen
DER #6	5.00	Solar PV Generator	RG&E	FICS chosen
DER #7	5.00	Solar PV Generator	RG&E	FICS chosen
DER #8	5.00	Solar PV Generator	RG&E	Project withdrawn by developer; Developer has not reapplied
DER #9	5.00	Solar PV Generator	RG&E	Standard Interconnection Chosen

Table 1 Summary of Prospective FICS Projects

The background, along with progress through Q2 – 2020, of each project is provided below.

#### 2.1.1 FICS DER #1

On June 28, 2016, the developer of the 2 MW PV DER executed a FICS agreement with NYSEG. On July 21, 2016, NYSEG was informed that the 2 MW PV farm project was on hold pending a grasslands bird study. As the agreement has been executed for this project, NYSEG continued to progress the project factory acceptance test (FAT) and a modified site acceptance test (SAT) in preparation for resumed field activities. The grassland bird study was complete and the developer removed the hold from the project in April 2018.

NYSEG completed installation of much of the substation equipment for DER #1 in November 2017. The communications tower at the substation for DER #1 was installed as of Q3 2018. In June 2019, NYSEG and its ANM solution vendor, Smarter Grid Solutions (SGS), re-initiated discussions with the developer for DER #1 in order to coordinate the requirements of the ANM solution with the design and construction of the PV farm. These discussions have continued through Q3 and into Q4 2019. The ANM solution has experienced some delays due to concerns related to cybersecurity related to the solution's architecture and interfaces with NYSEG systems. In Q4 2019, NYSEG commenced exploration of several possible architectures for the ANM solution. These architectures were unable to move forward because

of cybersecurity concerns. On December 23, 2019, NYSEG sent the developer the Final Acceptance Letter for the project. In Q1 2020, NYSEG held an in-depth discussion with internal cybersecurity stakeholders to evaluate potential architectures for the ANM solution for DER#1. The chosen architecture, leverages NYSEG's corporate network to provide telecommunications between the DER site and the Energy Control Center (ECC). In Q2 2020, NYSEG plans to deploy a communications cabinet to the DER site to provide the required communications back to the ECC. NYSEG will also continue working with the DER developer to perform the necessary site work to integrate the ANM Element located at the DER site with the NYSEG communications cabinet and the developers Data Acquisition System (DAS). DER #1 is scheduled for ANM Element deployment and Site Acceptance Testing (SAT) around the same time as DERs #5-7 in Q4 2020.

### **2.1.2 FICS DER #2**

On June 29, 2016, NYSEG issued a proposed FICS agreement for a 450 kW farm waste generator. NYSEG offered three options to interconnect the generator:

1. Do not participate in FICS and upgrade the Aurora substation transformer bank;
2. Participate in FICS, with the generator managed by ANM to address the thermal capacity constraint at the Aurora substation transformer bank. Install new distribution line regulation to prevent high-voltage conditions; or
3. Participate in FICS, with the generator managed by ANM to address the thermal and voltage constraints.

On September 12, 2016, the developer for DER #2 stated that the go-forward decision on this project was on hold pending the interpretation of the \$5k maximum interconnection fee for farm waste generators as described on Page 49 of the New York State Standardized Interconnection Requirements and Application Process For New Distributed Generators 5 MW or Less Connected in Parallel with Utility Distribution Systems. As the customer had not executed the agreement on this project, NYSEG deferred construction, configuration, and testing the ANM platform for this project pending execution of the FICS agreement.

On January 24, 2017, the developer for DER #2 resumed interconnection discussions with NYSEG. On June 2, 2017, NYSEG provided an updated analysis and cost estimate to address the changes in the interconnection queue and projects subsequently placed into service. On December 1, 2017, the developer again resumed interconnection discussions and was informed that the project had been removed from the interconnection queue due to failure to meet PSC mandated time constraints. The developer will have to reapply for interconnection if still interested in moving forward with the project. The developer expressed a desire to reapply, but NYSEG has yet to receive an interconnection request for the project.

#### **2.1.2.1 FICS + Energy Storage**

NYSEG/AVANGRID worked with Smarter Grid Solutions to evaluate an Energy Storage System in the NYSEG Aurora Substation that would have eliminated the need for voltage regulators for DER #2. The energy storage system would have been used to reduce the amount of curtailment of the DERs at this

location. SGS presented their analysis on November 13<sup>th</sup>, 2017. The combined project would have required a 350 kW/1 MWh battery with a 1 MVA inverter. The preliminary analysis indicated that a battery storage system had the potential to increase the hosting capacity of the circuits involved, however, the NYSEG/AVANGRID team did not pursue this proposal based on the additional project costs associated with the battery storage system.

### **2.1.3 FICS DER #3**

FICS DER #3 is a 1.7 MW PV installation in Peruville. The ANM analysis and cost estimate were nearing completion when the developer notified NYSEG that the landowner had passed away without providing land rights. Since the project is deferred indefinitely, development of the FICS project has stopped.

### **2.1.4 FICS DER #4**

The developer of a 2 MW PV installation in Richfield expressed interest in pursuing a flexible interconnection option. As this installation was voltage flicker limited, it was a new use case for a FICS solution requiring a faster control response. Further analysis and testing was required to prove the solution would provide the requisite power quality. The developer was notified on May 24<sup>th</sup>, 2017 that the project had been removed from the NYSEG Interconnection Queue due to inactivity.

### **2.1.5 FICS DER #5 - 7**

FICS DERs #5-7 are three proposed 5 MW solar PV DG systems to be interconnected to RG&E's Station 113 by the same developer. The interconnection of the three 5 MW solar PV DG systems are projected to exceed the thermal capacity of the existing substation. As an alternative to the cost of upgrading the existing substation transformer capacity, SGS was consulted to determine the feasibility of ANM as a solution. In July 2018, SGS began evaluating if the sites were potential candidates for a FICS solution. SGS subsequently determined that the three sites were a strong candidate for FICS. In September 2018, RG&E in collaboration with SGS began to develop an ANM solution to defer the infrastructure modifications identified in the original CESIRs. RG&E also requested a technical or financial backstop in the event of loss of life to the substation transformer due to thermal loading from the DG interconnection. On December 6, 2018, RG&E held discussions with SGS and the Developer to clarify the backstop requirement. The Developer decided to design a protection scheme to trip off the sites if the ANM Scheme malfunctions and the transformer thermal rating is breached to meet the backstop requirement. RG&E agreed to the protection scheme concept as a backstop to the FICS ANM Scheme in Q1 – 2019. RG&E is currently working with the developer to agree to a corresponding ANM agreement for each of the three DER sites. RG&E is leveraging lessons learned from the ANM Scheme for DER #1 for DERs #5-7 and plans to utilize similar communications architecture for communications back to the ECC. As of this report, the three projects are scheduled for mechanical completion at the end of Q3 2020 and testing and commissioning of the ANM Element field devices at each DER site is scheduled for the beginning of Q4 2020.

### **2.1.6 FICS DER #8**

During Q3 2019, a developer of a 5 MW PV site contacted NYSEG wishing to explore the possibility of utilizing a FICS solution to address constraints identified in the CESIR. The project was originally cancelled by the developer in April 2019, but the developer wished to explore opportunities to revive the project by exploring the possibility to addressing the feeder regulation for reverse power constraint violation with FICS. RG&E worked with SGS to determine that the site showed potential to be addressed by FICS. Because the original project had been cancelled by the developer prior to the developer notifying RG&E of its interest in FICS, RG&E advised the developer to reapply if it wished to pursue an ANM solution. At the time of this report, the developer has not reapplied. RG&E will reinitiate FICS discussions for DER #8 if the developer decides to reapply.

### **2.1.7 FICS DER #9**

FICS DER #9 is a proposed 5 MW PV DG site in RG&E service territory. The developer of this site expressed interest in pursuing a FICS solution to alleviate the flicker constraints determined in the project's CESIR. Further evaluation of the CESIR determined that FICS was a viable option to address the flicker constraint, but RG&E and the developer agreed to wait for the results of the Advanced Time-Series Analysis before deciding whether or not to pursue an ANM solution. The Advanced Time-Series Analysis was completed in December 2019 and determined that the project did not violate flicker constraints at its full output of 5 MW. With the flicker constraint removed, the developer chose to move forward with a standard interconnection.

### **2.1.8 Integrated Solution Proposal**

NYSEG/AVANGRID is participating in a NYSERDA PON3397 proposal to integrate interconnection functionality between Smarter Grid Solutions, Clean Power Research, and CYME.

At the end of the demonstration project, the plan is to integrate FICS into a business-as-usual process. AVANGRID, CYME, Clean Power Research and SGS held a CYME process meeting on September 25, 2017. The parties held another meeting on December 20, 2018 to review the changes to the interconnection application process flow in this proof-of-concept. AVANGRID, CYME, Clean Power Research, and SGS held another meeting on March 2, 2018 to demonstrate the PoC solution to AVANGRID's Interconnections and Distribution System Planners. On May 25, 2018 SGS provided a narrative video describing the IOAP integration tool to AVANGRID and on June 18, 2018 a meeting was held with members of AVANGRID's Interconnection and Distribution System Planning teams to review the demo video and discuss future plans and improvements to the interconnection process. The meeting yielded many fruitful discussions that will be used to drive the future plans for AVANGRID's interconnection portal and SIR review process.



## 2.2 Metrics and Checkpoints

Table 1: Checkpoints

Checkpoint	Description
Selection of the FICS Option	<p>Measure: The number and percentage of FICS-qualified projects that elect the FICS option expressed as both the number of projects and MWs.</p> <p>When: Execution of interconnection contracts with participating developers is targeted for Q2 2016, therefore progress updates will be provided in the Q4 2015 and Q1 2016 reports.</p> <p>How: FICS qualification is based on preliminary screening of DER interconnection applications, where ANM can enable incremental DER generation capacity that would otherwise require network reinforcement to accommodate the full proposed capacity.</p> <p>Expected Target: At least two DER developers in the NYSEG and/or RG&amp;E territory will elect the FICS option during the demonstration term.</p> <p>Strategy if Results are Below Expectation: If less than two developers provide a show of interest in the FICS option during initial outreach to be conducted in Q4 2015, AVANGRID will review options for next steps in site selection with Staff.</p> <p>Results: FICS DER #1 has elected the FICS option and FICS DER #2 has not proceeded. Pursuing FICS option with DER #5-7</p>
Interconnection Cost	<p>Measure: The total utility infrastructure cost per MW interconnected and the avoided cost of network reinforcement that would otherwise be required. The original project metric proposed included Interconnection Timeframe, but comparing the interconnection period during the demonstration term to that of a firm interconnection may be misleading since the timeline to deliver the ANM system does not accurately represent the timing of deploying ANM at additional DERs following the demonstration term.</p> <p>When: ANM system go live is targeted for Q4 2016, therefore a review of the final interconnection cost for participating sites will be included in the Q4 2016 report.</p> <p>How: The total cost per MW interconnected will be available following completion of the interconnection. The avoided cost of network reinforcement will be determined in the CESIR process based on an estimate developed by AVANGRID.</p> <p>Expected Target: ANM projects in the U.K. have reduced interconnection costs by up to 90 percent. Interconnection costs for current and historical DER projects governed by the New York Standardized Interconnection Requirements vary by location depending on a number of factors, including size of the project, existing network topology, and required network reinforcement. Therefore, it is challenging to project expected cost avoided through FICS at this time. AVANGRID will propose reasonable comparative</p>

	<p>assumptions for Staff review.</p> <p>Strategy if Results are Below Expectation: Developers will likely not participate in FICS unless there is a cost savings in completing their interconnection. Avangrid will identify scenarios/opportunities where FICS could provide a more economical solution.</p> <p>Results: FICS DER #1 results in an estimated deferral of 57% of the interconnection costs. FICS DER #2 results in an estimated 98% reduction in interconnection costs compared to an interconnection for firm capacity. FICS estimates are still in development for DER #5-7, but AVANGRID expects a 70-80% deferral of interconnection costs</p>
Additional MW Exported and Share of Generation Curtailed	<p>Measure: The additional generation exported by participating DER installations (versus projected generation of the baseline firm interconnection capacity offered) and the share of generation curtailed expressed as a comparison between actual curtailment and forecasted curtailment.</p> <p>Timeline: ANM system go live is targeted for Q4 2016, therefore generation and operational curtailment levels will be included in the Q4 2016 report.</p> <p>How: Additional DER generation exported will be measured starting during operations in Q4 2016 and compared to participating developers' generation projections. The share of generation curtailed due to constraint management will be measured during operations in Q4 2016 and compared to Smarter Grid Solutions' forecasted curtailment (as an annualized percentage). Curtailment due to communications failures and network outages will be highlighted and differentiated from curtailment due to constraint management.</p> <p>Expected Target: Additional DER generation exported will vary by project and site. The average DER project curtailment has been approximately five percent annually in the U.K.</p> <p>Strategy if Results are Below Expectation: If actual curtailment in Q4 2016 exceeds the forecasted level on an annualized basis, AVANGRID and Smarter Grid Solutions will reexamine modeling results to refine the curtailment forecast.</p> <p>Results: FICS DER #1 is a 2 MW rated photovoltaic generator. FICS DER #2 is a 450 kW farm waste generator. DER #5-7 are each 5 MW rated photovoltaic generators for a total of 15 MW. These sites are not yet operational.</p>
Total FICS Utility Revenue	<p>Measure: Utility revenues from platform-as-a service fees in the aggregate and on a per-MW basis for participating projects.</p> <p>When: Execution of FICS-based interconnection contracts with participating developers is targeted for Q2 2016, therefore progress updates will be provided in the Q4 2015 and Q1 2016 reports.</p> <p>How: Platform-as-a-service fee included in interconnection contracts executed with participating developers, which may be based on a shared risk structure.</p> <p>Expected Target: The area of commercial development for the platform-as-a-</p>

	<p>service business model is a primary focus for testing. AVANGRID is aiming to obtain robust lessons learned on effective development of revenue opportunities from FICS. In the July 1 FICS proposal filing, AVANGRID examined various fee options that would cover the revenue requirements of adopting FICS capabilities, with analysis indicating that an annual fee charged to each DER would cover the revenue requirements of ANM at scale with DERs contracted.</p> <p>Strategy if Results are Below Expectation: Capture robust lessons learned on developing revenue opportunities from FICS should be the primary indicator of successful testing for the project. Avangrid will identify barriers preventing revenue generation and assess potential alternative revenue models.</p> <p>Results: The FICS DER #1 contract did not include platform service fees, but used a cost deferral calculation instead. The draft FICS DER #2 agreement options included a platform fee of \$23,000 or \$12,000, depending upon the option chosen. Avangrid is currently evaluating a couple different fee structures including both an annual and a one-time fee.</p>
Customer Satisfaction	<p>Measure: Key drivers and obstacles of FICS adoption among targeted DER developers.</p> <p>Timeline: Execution of FICS-based interconnection contracts with participating developers is targeted for Q2 2016, therefore surveying results of targeted developers that decided not to go forward with FICS will be presented in the Q2 2016 report and surveying results of participating projects will be presented in the Q4 2016 report.</p> <p>How: Post-interconnection survey of all targeted developers, including those that decided not to go forward.</p> <p>Expected Target: AVANGRID is aiming to obtain robust lessons learned from non-participating developers to inform future FICS site selection and outreach efforts and to gather lessons learned from participating developers to inform how ongoing ANM operations can meet developers' needs.</p> <p>Strategy if Results are Below Expectation: AVANGRID will evaluate how to improve engagement efforts to increase future participation in FICS and meet participating developers' needs.</p> <p>Results: Section 4.0 of this report discusses observations from discussions with targeted developers.</p>
External Engagement	<p>Measure: Lessons learned and opportunities for scaling FICS based on feedback from external, non-developer stakeholders with a role in DER development and interconnection in New York.</p> <p>Timeline: AVANGRID will provide updates in each quarterly report on engagement outcomes with the Joint Utilities, NYSERDA, etc.</p> <p>How: Description of stakeholder engagement lessons learned.</p> <p>Expected Target: AVANGRID will engage NYSERDA with the aim to gauge the statewide baseline interconnection record for funded DERs, to effectively develop the platform-as-a-service business model, and identify opportunities</p>

	<p>for other ANM applications to increase DER interconnections in New York. AVANGRID will engage the Joint Utilities to review current interconnection challenges and alternative interconnection solutions being developed in New York.</p> <p>Strategy if Results are Below Expectation: AVANGRID will utilize NYSEG and RG&amp;E interconnection records as its base data set for reviewing and comparing interconnection outcomes and challenges.</p> <p>Results: We continue to gain insights from the FICS demonstration project and we are investigating tools and options to facilitate FICS as a business-as-usual process. We evaluated Clean Power Research’s PowerClerk tool for interconnection administration and we were a partner to a NYSERDA PON proposal to integrate FICS, PowerClerk, and CYME.</p>
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## 2.3 Issues

Over the course of this project we have experienced several issues that have delayed the project considerably. An abbreviated list of some of the issues we encountered can be seen below.

- Changes in the queue require re-doing the FICS analysis and cost estimates.
- Flicker management is a new use case for FICS and requires additional analysis and testing to prove its effectiveness.
- Extended project delays leading to DER project cancellations and removal from the interconnection queue
- Identifying FICS candidates in current interconnection review process
- Establishing standards for the installation of standalone primary line voltage sensors
- Interfacing new technologies to utility control systems requires adherence to strict cybersecurity standards

## 3.0 Work Plan

### 3.1 Budget Review

Through Q2 2020, project spend is above the projections included in the FICS implementation plan. Much of this is due to timing with the delay and cancellation of many of the targeted projects leading to increased operational costs from additional site identification and as described above. Current projections show the overall project to be over budget. With incremental screenings for additional projects and potential scope expansions associated with NYSERDA PON proposals, the FICS project budget will require supplementing.

### 3.2 Updated Work Plan

Table 3: Work Plan

Activity	Q2 2020	Q3 2020	Q4 2020
Architecture Design and Approvals (DER #1 and 5-7)			
ANM Strata Factory Acceptance Testing (FAT)			
Site Acceptance Test (DER #1)			
Construction (DER #5-7)			
Communications Configuration (Strata ↔ Element)			
Communications Configuration (Strata ↔ SCADA)			
Deployment (DER #5-7)			
Site Acceptance Test (DER #5-7)			

### 3.3 Next Quarter Planned Activities

In Q3 2020 assuming the COVID-19 does not negatively impact the progress, the project team aims to complete the following tasks:

- Develop Operator Training and Operating Instructions for DERs #5-7
- Perform FAT and Pre-Production Testing on ANM Strata system
- Build and Configure communications pathway from ANM Strata system to the Companies' SCADA system
- Configure ANM Elements for DERs #5-7
- Finalize contract language for FICS solution for DERs #5-7
- Execute contract between RG&E and the Developer/Owner of DERs #5-7
- Finalize quote and bill the developer for the cost of the FICS solution for DERs #5-7

## 4.0 Conclusion / Lessons Learned

To date, the lessons learned from the Flexible Interconnect Capacity Solution Project have been extensive and broad regarding the potential for deploying ANM solutions as a business-as-usual part of our interconnection process. ANM has already been used elsewhere to defer expensive capacity upgrades and provide a more cost-effective interconnection solution to customers. Based on experience in this Demonstration Project, AVANGRID believes that ANM has the potential to bring the same value to customers in New York State. While unforeseen factors have delayed the implementation of our first FICS site, the developer reaction to a FICS solution has been positive as demonstrated by the continued interest in FICS from DER developers in NY State. AVANGRID believes that this is an indicator that FICS solutions would be attractive to developers if they were included as a business-as-usual part of our interconnection process. While developers have generally been eager to avoid static capacity reinforcement costs in exchange for a small amount of projected curtailment a year, to date, we have not been able to verify SGS's curtailment predictions with real-world performance data. To this end, we believe that it is important to continue with this demonstration project until we have had a chance to install and operate an ANM system for at least a year. This will allow us to gather all the appropriate data and lessons learned before we officially end the project.

### 4.1 Lessons Learned

Addressing flicker limitations with FICS will require additional analysis and testing, but it has the potential to increase DER capacity even further.

Changes in interconnection queues require revised analyses and cost estimates.

Lessons learned from the NYSERDA PON 3397 proposal have the potential to greatly increase the efficiency of processing and analyzing DER interconnection requests, including ANM analysis.

Combining Energy Storage with ANM technology has the potential to increase the hosting capacity of the circuit and allow for the interconnection of additional DERs, but energy storage is still a very costly solution and how that cost would be allocated to the DER projects is still unclear.

NYSEG and RG&E have little experience with actively controlling DER and therefore additional work must be done to develop policies and procedures when dealing with FICS sites for Operations personnel to follow to maintain situational awareness of the actions of the SGS ANM system at all times.

For large sites (>500 kW) that require a PCC recloser, the telecommunications package of the PCC recloser can be leveraged to provide communications between the ECC and the DER site for the ANM scheme to operate.