**Susan Vercheak***
Assistant General Counsel

May 8, 2017

Hon. Kathleen H. Burgess
Secretary to the Commission
New York State Public Service Commission
Agency Building 3
Albany, New York 12223-1350

Re: Case 16-M-0411 – In the Matter of the Value of Distributed System Implementation Plans, and

Case 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision

Dear Secretary Burgess:

Pursuant to the Public Service Commission's *Order on Distributed System Implementation Plan Filings* in the above matter, attached is the Joint Utilities' Supplemental Information on the Non-Wires Alternatives Identification and Sourcing Process and Notification Practices.

Please let me know if you have any questions.

Very truly yours,

Susan Vercheak

Attachment

*Admitted only in New Jersey
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**STATE OF NEW YORK**
**PUBLIC SERVICE COMMISSION**

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|---|---|---|
| In the Matter of Distributed System Implementation Plans | ) | Case 16-M-0411 |
| | ) | |
| Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision | ) | Case 14-M-0101 |
| | ) | |

# JOINT UTILITIES' SUPPLEMENTAL INFORMATION ON THE NON-WIRES ALTERNATIVES IDENTIFICATION AND SOURCING PROCESS AND NOTIFICATION PRACTICES

## I. INTRODUCTION

On March 9, 2017, the Public Service Commission ("Commission") issued its *Order on Distributed System Implementation Plan Filings*, which requires five filings related to the development of distributed system platform ("DSP") capabilities to achieve Reforming the Energy Vision ("REV") goals.[1] The Joint Utilities[2] submit this filing in compliance with the Commission's requirement that the Utilities describe how the Suitability Criteria for non-wires alternatives ("NWA") will be "incorporated into utility planning procedures, and how and when the Suitability Criteria will be applied to projects in their current capital plans."[3]

After filing individual Distributed System Implementation Plans ("Initial DSIPs") on June 30, 2016,[4] the Joint Utilities filed the Supplemental DSIP ("Supplemental DSIP") on

[1] Case 16-M-0411, *In the Matter of Distributed System Implementation Plans* ("DSIP Proceeding"), Order on Distributed System Implementation Plan Filings (issued March 9, 2017)("DSIP Order").
[2] The Joint Utilities are Central Hudson Gas & Electric Corporation ("Central Hudson"), Consolidated Edison Company of New York, Inc. ("Con Edison"), New York State Electric & Gas Corporation ("NYSEG"), Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid"), Orange and Rockland Utilities, Inc. ("O&R"), and Rochester Gas and Electric Corporation ("RG&E").
[3] DSIP Proceeding, DSIP Order, p. 32.
[4] Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, ("REV Proceeding"), Central Hudson Initial Distribution Implementation Plan ("Central Hudson DSIP"), Con Edison Initial Distribution System Implementation Plan ("Con Edison DSIP"), Niagara Mohawk Power Corporation d/b/a National Grid Initial Distribution Implementation Plan ("National Grid DSIP"), NYSEG/RG&E Distributed System

November 1, 2016,[5] pursuant to the Commission's *Order Adopting Distributed System Implementation Plan Guidance*.[6] The Supplemental DSIP included a common framework to identify projects that are most likely to be suitable for NWA solutions. The framework was intended to provide greater clarity, certainty, and long-term visibility to the market and help streamline the broader NWA procurement process going forward. To advance this development, each utility committed to provide a matrix of utility-specific NWA Suitability Criteria within four months of the Supplemental DSIP filing.[7] The Joint Utilities filed these utility-specific NWA Suitability Criteria matrices on March 1, 2017 ("March 1 Filing").[8]

As noted in the March 1 Filing, the Joint Utilities worked together to further refine the processes used for NWA opportunity identification and subsequent solution procurement, striving for consistency wherever practical.[9] Additionally, the Joint Utilities hosted a stakeholder engagement meeting on April 20, 2017 in New York City to review outcomes of the 2016 stakeholder engagement process on NWA Suitability Criteria and distributed energy resources ("DER") sourcing and present the Joint Utilities' implementation efforts in 2017 based on the commitments in the Supplemental DSIP. The engagement session included the Joint Utilities' presentation and discussion of the NWA sourcing process, which provided stakeholders with greater insight into the process and an opportunity to ask questions and provide input. The NWA sourcing process overview started with a brief review of the typical utility planning

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Implementation Plan ("NYSEG/RG&E DSIP"), Orange & Rockland Initial Distributed System Implementation Plan ("O&R DSIP")(all filed June 30, 2016). National Grid made an errata filing on July 1, 2016 to correct a number of format issues which replaced the June 30, 2016 National Grid DSIP in its entirety.

[5] DSIP Proceeding, Joint Utilities Supplemental Distributed System Implementation Plan (filed November 1, 2016) ("Supplemental DSIP").

[6] DSIP Proceeding, Order Adopting Distributed System Implementation Plan Guidance (issued April 20, 2016)("DSIP Guidance Order").

[7] DSIP Proceeding, Supplemental DSIP, p. 47.

[8] DSIP Proceeding, Joint Utilities Utility-Specific Implementation Matrices For Non-Wires Alternatives Suitability Criteria (filed March 1, 2017)("March 1 Filing").

[9] *Id.*, p. 2.

process that identifies distribution system needs to accommodate growth, increase reliability, or improve system resiliency, as well as those infrastructure projects traditionally developed to address those needs. The Joint Utilities described the application of the utility-specific NWA Suitability Criteria to the identified traditional infrastructure projects to meet the above needs, continued through the steps that further develop identified NWA opportunities for competitive solicitation, and concluded with the approach used for reviewing NWA proposals and, if appropriate, awarding contracts for DER solutions. The Joint Utilities recognized where there was existing alignment in the understanding of the process and took into consideration points raised by stakeholders.

As requested by stakeholders and directed by the Commission, this filing provides greater transparency into the NWA identification and sourcing processes through descriptions of how the NWA Suitability Criteria are applied as an integral part of capital planning and budgeting processes to identify NWA opportunities, and how the utilities will further develop those opportunities as the basis for a market solicitation, typically via Requests for Proposals ("RFPs"). The Joint Utilities also provide, as attached Appendices 1 through 5, utility-specific information on NWA Suitability Criteria, timing of the development of each utility's capital plan, identification of NWA opportunities, a description of project needs, and the expected timing of solicitations tied to those opportunities.

## II. CAPITAL PLANNING PROCESS

Each utility conducts transmission and distribution ("T&D") planning on an annual basis and manages its capital plan throughout the year. A primary objective of this process is to identify system needs and the traditional project solutions that address those needs, in order to maintain (and/or enhance) the safety and reliability of the system. This annual process assesses

current and future operating conditions relative to each utility's design standard and methodology to determine operating risks and identify corrective solutions to mitigate those risks. It also reassesses previously identified system needs and project solutions to confirm their continuing need and timing if the projects have not yet been initiated. This process includes the review of available data, including load forecasts, DER forecasts, asset condition, system reliability, and load serving capability.

Potential options for resolving system needs are developed and assessed for: (1) effectiveness in meeting the need, (2) cost, (3) implementation timing, and (4) risks associated with each option. Within this capital planning process, system needs are identified and the corresponding traditional solutions are prioritized based on balancing available capital and available resources against the risk of not addressing the system need within the timeframe of the capital plan. Each utility's capital planning process includes the selected T&D solutions as part of the annual capital budget and a multi-year (typically five-year) capital forecast; with the capital work plan updated annually and ultimately submitted to the Commission. As described below, the Joint Utilities will routinely update their capital plans and while capital budgets are developed on an annual cycle, the utilities will also manage and make adjustments to components of capital plans throughout the year. The utilities will apply the utility-specific NWA Suitability Criteria, and include NWA opportunities in the list of capital projects.

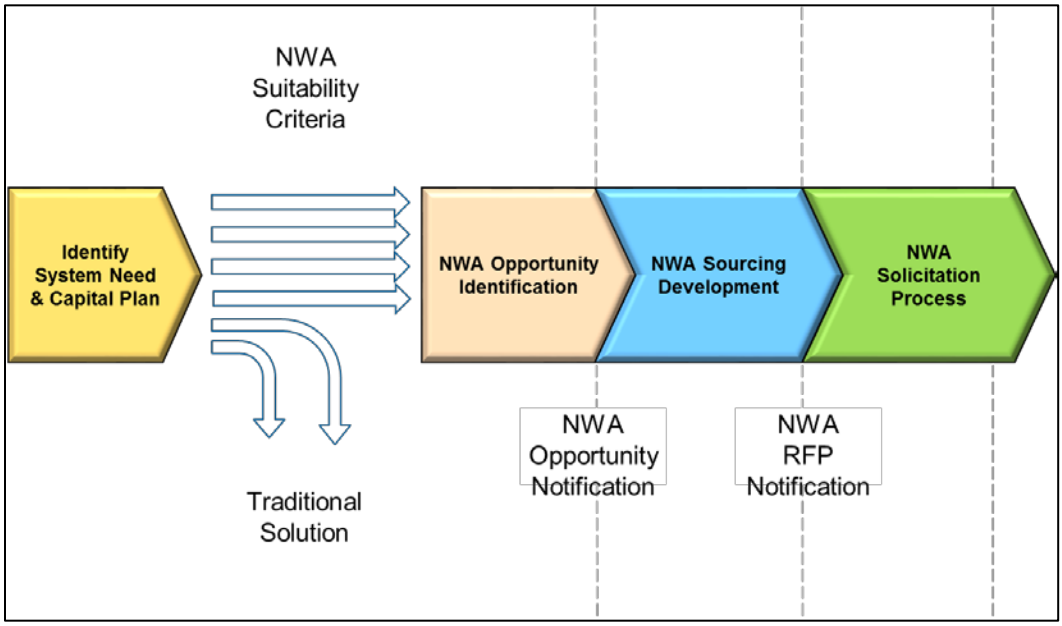
## III. NWA IDENTIFICATION AND SOURCING PROCESS

The identification of NWA opportunities and sourcing of NWA solutions is an iterative and interactive process that begins with the development of system needs within the capital

planning process. The process, shown in **Figure 1** below, incorporates the following steps generally spanning multiple business functions within a utility:[10]

1) *NWA Opportunity Identification* - Identification and quantification of system needs driving specific capital projects, including timing and location.
2) *NWA Sourcing Development* - Development of data for inclusion in solicitations (*i.e.*, RFPs);
3) *NWA Solicitation* - Procurement of NWA solution(s), including solicitation, bid/proposal review, negotiation, and contract award.

**Figure 1: NWA Identification and Sourcing Process**




This process is similar across each of the Joint Utilities. While each utility follows this basic process, there are minor differences among them in terms of time during the year that: (1) the T&D system planning is performed, (2) the annual capital plan is developed, and (3) the NWA Suitability Criteria are applied in the capital planning process. Utilities also differ in current use of internal resources to manage this process. However, each utility fundamentally follows the overall process illustrated in **Figure 1**, described in more detail below.

[10] For some utilities, these functions may be part of a single team or work group.

The Joint Utilities expect this process to continue to evolve. Currently, the Joint Utilities appropriately consider and treat non-wires opportunities as "alternatives" to traditional investments and evaluate them in that context. Upon more experience being gained and the development of more advanced and appropriate tools, processes and systems, DER are expected to become one of many options available to T&D planners when scoping solutions to meet system needs, thus reducing or eliminating the need for a distinctly separate process to identify NWA opportunities. As a result, incorporating the consideration and adoption of DER solutions is expected to become a more routine step in the annual capital planning process. Separately, as noted by stakeholders, price signals are expected to play a greater role in bringing DER onto the grid, and in turn, are expected to mitigate some of the system needs that otherwise would require a specific capital project or NWA solution.

### A. Application of NWA Suitability Criteria and Identification of NWA Opportunities

A central goal of REV is to maximize DER as cost-effective alternatives to traditional infrastructure investments, using market means to develop and finance projects wherever possible. To that end, in 2016, the Joint Utilities, in consultation with stakeholders, developed NWA Suitability Criteria and processes for applying these criteria, so that infrastructure projects that presented viable opportunities for DER solutions to replace or defer traditional solutions would be transparently identified. These processes are intended to identify and direct developers[11] to the opportunities that have the highest potential of success for DER development and to improve the efficiency of the procurement process for all parties.

[11] The term "developers" herein is intended to broadly reflect any participants in NWA solutions.

As discussed in the Supplemental DSIP and the March 1 Filing, the NWA framework and NWA Suitability Criteria incorporate utility-specific criteria for project type, timeline, and cost. Annually, the utilities' planning engineers or NWA sourcing groups apply these criteria to the identified traditional solutions in the current capital plan. A detailed analysis evaluates all aspects of a project with respect to the project applicability, timing, and cost portions of the suitability matrix.

The distribution system is dynamic and typically there are multiple drivers for a project need. These drivers could include expected local load growth, ability to meet design standards and/or mitigate operational risks, reliability needs due to lack of operational flexibility, or equipment obsolescence, operational requirements to satisfy voltage, protection, or power quality issues, and/or ability to satisfactorily address potential safety concerns. All of these, as well as other potential drivers, such as new business or responding to mandatory facilities relocation work, must be evaluated to determine if the location or project solution provides an opportunity for an NWA solution to economically and operationally address the same needs as the traditional solution. Timing is also a key consideration in a solutions evaluation. An adequate amount of time must be available for both the potential implementation of an NWA solution and, in the event that the proposed NWA solution is of limited duration or ineffective, there must be sufficient time to implement a traditional infrastructure solution, including time for detailed design, permitting, and construction. Finally, projects must be capable of demonstrating substantial value, particularly the likelihood of overcoming the transaction costs associated with NWA solutions.

The outcome of applying the NWA Suitability Criteria to the capital plan is a list of traditional infrastructure projects that are candidates for NWA solutions. This list will serve as

an early indication to the market of the scale and scope of potential NWA opportunities from this current planning cycle. As part of their individual DSIPs, the utilities informed stakeholders of NWA opportunities identified in 2016. Starting in mid-May 2017, the Joint Utilities will post on their respective websites the list of potential NWA opportunities along with preliminary descriptions and expected timing for potential solicitations associated with the identified NWA opportunities. Additionally, the Joint Utilities will leverage the New York State Research Energy Research and Development Authority ("NYSERDA")-sponsored REV Connect statewide portal once it becomes available by posting announcements and descriptions of the NWA opportunities that exist across the State. Until the REV Connect portal is available, the utilities will host a webpage on the Joint Utilities' website directing developers, vendors, and other third parties to the individual utility websites for more complete utility-specific information.

As noted in the March 1 Filing, the Joint Utilities will continue to evaluate, reassess, and update as necessary the Suitability Criteria as experience is gained and lessons are learned.[12]

### B. Development and Refinement of Specific NWA Opportunities

Each utility has a sourcing team who works with planning engineers and other utility staff to more precisely define the system needs and further develop the NWA opportunities. This includes prioritizing the identified NWA opportunities consistent with the prioritization approaches included in the capital planning process and further developing the timing of the issuance of an RFP to address these opportunities. Such an RFP must include sufficient information to effectively and efficiently inform potential bidders of the specific operational

[12] DSIP Proceeding, DSIP Order, p. 2.

requirements and relevant operating and aggregated customer demographic information.[13] A utility's sourcing team may act as a bridge to its procurement group[14] to facilitate inclusion of this information into the solicitation, with the goal of providing valuable information to developers. These developers can then use that information to propose cost-effective solutions that align well with system needs.

Viable NWA opportunities are prioritized based on the timing of the system need, with near-term opportunities tied to more urgent needs moving to the RFP stage ahead of those opportunities with needs further out in the planning horizon. The level of operational and execution risk assigned to a single solution, or portfolio of solutions, is correlated to the designated timeline to meet the planning need. Projects that target critical needs with high operational risks are more likely to require more stringent performance requirements and contract terms for NWA solutions. NWA opportunities identified through the planning and NWA Suitability Criteria processes that are prioritized for solicitation to occur within the current twelve-month planning process are typically advanced to an RFP by the sourcing team.

The NWA solicitation is intended to provide as complete a picture as possible of the system need and the commercial and operational performance required of solutions in order for the NWA solicitation to provide successful market results. In support of this goal, the sourcing team, again in conjunction primarily with distribution system planners, engineers, and other utility staff, works to develop supporting operating information and data to best inform developers of the potential for DER development in the area of identified need. For example, the sourcing team may develop relevant customer demographic data, historical and forecast loads,

[13] To date, RFPs have been the primary solicitation vehicle for NWAs, although some utilities have initiated auction methods.

[14] This characterization of the NWA sourcing group acting as a bridge with the procurement group applies to the case in which procurements are conducted outside of the NWA sourcing group. In the case of some utility NWA procurement processes, the NWA sourcing group conducts the entire procurement process.

and other geographic data to clarify and potentially quantify the load reduction potential at a particular substation or region of the grid associated with a system need. With a clearer definition of the specific system need, coupled with their knowledge of the market, developers can advance their proposals for DER solutions to meet those system needs. This information will be incorporated into an RFP in as much detail as possible, while still allowing the flexibility for developers to propose new and innovative products and services. The Joint Utilities typically take a technology agnostic approach in this data development and situational evaluation.

In some cases, a NWA opportunity identified in the planning process may be associated with a system need that does not require that a RFP be issued within twelve months because the need is further out in time and thus has the potential of changing due to system conditions or potential changes in net load forecasts or other planning parameters. In this situation, the system need will be considered in future capital plans and may be subject to reevaluation if the drivers (*e.g.*, load growth and/or new business block loads) that prompted the system need have changed. As a consequence, during the next annual planning process, an NWA opportunity previously identified may change. Similarly, it is possible that traditional projects identified during a previous planning assessment that were not identified as candidates for NWA opportunities may, due to changes in drivers, be identified as new NWA opportunities by applying the NWA Suitability Criteria in the future. In summary, either the size of the need could be smaller or larger, or the timing of the need could be accelerated, delayed, or eliminated, depending on changed circumstances that occur from one planning cycle to the next.

### C. NWA Procurement

The Joint Utilities each currently follow their prescribed process for procurements, including pre-bid conference calls or webinars, question and answer sessions, bid package

submittal requirements, and schedules. Upon receipt of bids, each utility follows a company-specific bid review process for verifying completeness of bids submitted and bidder qualifications. Bids that successfully meet the RFP requirements are further evaluated to formulate a portfolio(s) of solutions to satisfy the need. These portfolio(s) are evaluated using the methodology outlined in the applicable version of each utility's most recent Benefit-Cost Analysis Handbook to determine the most cost-effective bid or combination of bids.[15] The utility conducts negotiations around operational and commercial terms to determine final contract awards.

The time provided to respond to RFPs depends on several factors, including but not limited to, the timing and size of the need, as well as the expected complexity of the solution. As raised by stakeholders, bid respondents require sufficient time to develop robust and responsive proposals. The Joint Utilities support providing adequate response time; however, given that system needs are dynamic, releasing solicitations too early increases the possibility that the initial information provided may change materially and considerably impact both the proposal development and final award. It is also important to note that extending the response time for RFPs could extend the timeline criteria, resulting in a longer lead time for procuring NWA solutions. In short, the time to formulate and submit a bid package will vary across individual RFPs and across utilities.

### D. NWA Opportunities Notification Practices

The Joint Utilities support the goal of improving the transparency of the NWA identification and solicitation process, including what NWA opportunities exist, which ones are

[15] *See* REV Proceeding, Order Establishing the Benefit Cost Analysis Framework (issued January 21, 2016) ("BCA Order"), pp. 11-13, requiring the utilities to perform a Societal Cost Test ("SCT"), a Utility Cost Test, and a Ratepayer Impact Measure for comparison purposes; however, the SCT is the primary test to evaluate the cost-effectiveness of DER.

being solicited, and when RFPs are expected to be released. Currently, the application of NWA Suitability Criteria and development of the NWA opportunity list are internal processes, performed as an integral part of the annual capital planning and budgeting process. The first iteration of this process occurred as part of the development of each utility's individual DSIP filing,[16] which identified those projects in the capital plan that satisfied the utility-specific screens in place at that time.

Each of the utilities currently uses various avenues to publicize, announce, and distribute their RFPs to prospective bidders. As discussed in the Supplemental DSIP, the utilities currently post NWA opportunities and solicitations under the applicable docket on the Commission's website.[17] By late May, each of the utilities will post on their respective websites their utility-specific list of current potential NWA opportunities, along with preliminary descriptions and expected timing for potential solicitations associated with the identified NWA opportunities. As noted above, when the NYSERDA's REV Connect product and service portal becomes available, the utilities will use it to post a description and status of all NWA opportunities that exist across the State. In the interim, the Joint Utilities will host a centralized webpage on the Joint Utilities' website directing developers, vendors, and other third parties to their individual utility websites for more complete utility-specific information. In addition, each of the utilities will conduct information sessions describing RFP opportunities, either prior to the release of RFPs, or during the initial process following the RFP release. These sessions will outline the upcoming bidding and award process and parameters. The Joint Utilities will post the notices on their own websites, as well as with the Commission under this DSIP docket. Further, as suggested by stakeholders, some utilities are exploring social media, such as Twitter, to expand

[16] *See* Note 4, *supra*.
[17] DSIP Proceeding, Supplemental DSIP, p. 101.

notification, as well as posting on industry association websites and announcements at relevant industry conferences.

## IV. CONCLUSION

The Joint Utilities have been working together to improve the transparency of the NWA identification and sourcing process, with an emphasis on providing greater visibility into the application of NWA Suitability Criteria and preliminary identification of NWA opportunities, the process of sourcing NWA solutions, and the timing of potential RFPs. The Appendices supplement the information provided in the utilities' individual DSIPs[18] with additional details on the status of identified NWA opportunities, including the estimated timeline for RFP release, as applicable. The utilities will post information on NWA opportunities and potential RFP timing on their respective websites and are committed to the integration and expansion of DER on their respective electric delivery systems.

Dated: May 8, 2017

Respectfully submitted,

**CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. and ORANGE AND ROCKLAND UTILITIES, INC.**

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[18] *See* Note 4, *supra*.

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# Appendix 1

## APPENDIX 1: Central Hudson

### Central Hudson Integrated Planning Process with NWA Suitability Analysis

Central Hudson's Capital Planning Process and NWA Identification And Sourcing Process is accurately reflected in the main body of this filing and is not repeated in this Appendix, other than details on timing of the process specific to Central Hudson, as discussed below.

### NWA Suitability Criteria

| Criteria | Potential Elements Addressed | |
|---|---|---|
| **Project Type Suitability** | • Project types include Load Relief and Reliability*. Other categories currently have minimal suitability and will be reviewed as suitability changes due to State policy or technological changes. | |
| **Timeline Suitability** | **Large Project** | • 36 to 60 months |
| | **Small Project** | • 18 to 24 months |
| **Cost Suitability** | **Large Project** | • ≥ $1M |
| | **Small Project** | • ≥ $300k |

*Reliability projects entail projects for remote single source regions or customer requested enhanced reliability projects (*i.e.*, redundant supplies).

### Current Capital Investment Plan

Central Hudson's annual CIP is filed each year on July 1st. The most current publicly available CIP, 2017-2021, was filed as Appendix H of Central Hudson's DSIP filing and can be viewed at the following link:

http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={924DC812-D086-41F3-8FA0-3C96756F5ABB}

**Current NWA Opportunities**

Central Hudson has four NWA projects currently underway. Three projects have already been implemented and one is in the procurement phase.

| Project Name/Description | Project Type | Need Timing | Project Size | Procurement & Development Timeline | Estimated RFP Timing |
|---|---|---|---|---|---|
| Coldenham / Distribution Feeder Upgrade | Load Relief | Dec 2019 | Small | 34 months | Mar 2017 (NWA Currently Underway) |
| Philips Road / Substation | Load Relief | May 2018 | Large | 42 months | Nov 2014 (NWA Currently Underway) |
| Northwest Corridor / Transmission Upgrade | Load Relief | May 2019 | Large | 54 months | Nov 2014 (NWA Currently Underway) |
| Merritt Park / (2) Distribution Feeder Upgrades | Load Relief | May 2019 | Small | 54 months | Nov 2014 (NWA Currently Underway) |

**Additional Details about Near-term NWA Opportunities**

*Coldenham*: This project was identified in the 2017-2021 CIP. To successfully defer a distribution feeder upgrade, 1 MW of load relief is needed by 2019. Solicitation occurred in March and April 2017. Solutions are currently being evaluated.

*Philips Road*: This system need and project was identified during the 2015 planning process. To successfully defer a new substation, 5 MW of load relief is needed by 2018. Solicitation occurred in the fourth quarter of 2014, leading to the implementation of a targeted demand management

program, which is currently underway.

*Northwest Corridor*: This system need and project was identified in the 2015 planning process. To successfully defer a transmission upgrade, 10 MW of load relief is needed by 2019. Solicitation occurred in the fourth quarter of 2014, leading to the implementation of a targeted demand management program, which is currently underway.

*Merritt Park*: This system need and project was identified in the 2015 planning process. To successfully defer the upgrade of two distribution feeders, 1 MW of load relief is needed by 2019. Solicitation occurred in the fourth quarter of 2014, leading to the implementation of a targeted demand management program, which is currently underway.

# Appendix 2

## APPENDIX 2: Con Edison

### Con Edison Integrated Planning Process

On an annual basis, the distribution planning process starts to determine how best to serve forecast load, net of load growth and distributed energy resources ("DER")-related load reductions. Distribution planning is a complex and iterative process and is described in detail in the Con Edison Initial Distributed System Implementation Plan ("DSIP").[1] During this process, an assessment of the current capability of Con Edison assets, based on the design criteria, type of asset, thermal ratings, and local power factors is performed. One type of analysis performed compares the capability of assets to the forecast loads to determine if the asset might become overloaded during system peak conditions and under various contingencies. Multiple options are then considered to optimally relieve the overloads. These types of projects are defined as load relief, a subcategory of system expansion that reflects the organic load growth of existing customers. In addition to the areas of need above, Con Edison also budgets for emergency response and replacement, information technology ("IT") solutions to meet strategic business needs, reliability work (which includes inspection and targeted replacement), and public works projects to re-route Con Edison equipment due to municipal right-of-way.

Over the past several years, Con Edison has increasingly utilized energy efficiency and demand reduction programs to help meet system expansion or load relief needs in the most cost-effective means possible. As part of the capital work plan optimization and consistent with Reforming the Energy Vision ("REV"),[2] Con Edison expanded the types of DER that it would utilize to meet load relief needs. The Brooklyn Queens Demand Management Project

[1] Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision (*"REV Proceeding"), Con Edison Initial Distribution System Implementation Plan (filed June 30, 2016)("Con Edison DSIP"), pp. 7-13, 137-141.
[2] REV Proceeding, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015), pp. 66-72.

("BQDM") tested this concept to defer a $1 billion substation.[3] Subsequently, Con Edison's Initial DSIP presented several additional system expansion or load relief projects that might benefit from a portfolio of DER and/or traditional solutions.[4] These DER technologies now include energy efficiency, demand reduction, renewable energy, and combined heat and power, many of which are located at the customers' facility.

**Capital Work Plan**

Con Edison's capital budget approach is to balance system needs to meet customer expectations for safe and reliable service while managing costs to reduce customer bill impact. Con Edison achieves this through several planning and analytical processes and by leveraging its significant technical experience to create an optimized capital work plan.

Con Edison initiates its annual planning cycle immediately following the summer operating period each year, and completes its capital planning and optimization process by the following April/May timeframe. Initially system needs and options for resolving those needs are identified and evaluated for project effectiveness, cost, timing, and risk. Once the initial assessment is completed in April/May, the results of the planning and optimization process become the proposed capital work plan for the five-year period beginning the prompt year. The proposed capital work plan will continue to undergo an iterative review process lasting up to six months before receiving formal corporate approval and becoming the final Capital Investment Plan ("CIP") in November. This final CIP includes the following year's annual capital budget as the initial year of a five-year capital forecast.

[3] Case 14-E-0302, *Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn/Queens Demand Management Program*, Order Establishing Brooklyn/Queens Demand Management Program (issued December 14, 2014).
[4] *E.g.*, REV Proceeding, Con Edison DSIP, pp. 129-141.

As part of the capital work plan review process, Con Edison is committed to assessing the proposed traditional capital infrastructure projects for potential non-wires alternative opportunities and communicating those opportunities to interested parties. For the non-wires alternative opportunities identified in this Appendix, Con Edison utilized the proposed capital work plan results most recently completed after the summer of 2016 operating period.

**Non-Wires Alternative Suitability Criteria**

In an effort to incorporate non-wires alternatives identification into the planning process and help identify non-wires alternative opportunities with the best chance of success in a competitive procurement process, Con Edison provided its utility-specific guidance in the March 1, 2017 filing for the three criteria included in the common Non-Wires Alternative Criteria Framework.[5] These criteria represent an early assessment and indication of whether DER solutions should be considered as potential alternatives to traditional infrastructure projects.

[5] Case 16-M-0411, *In the Matter of Distributed System Implementation Plans*, Joint Utilities Utility-Specific Implementation Matrices for Non-Wires Alternatives Suitability Criteria (filed March 1, 2017), Appendix 1.

| Criteria | Potential Elements Addressed | |
|---|---|---|
| **Project Type Suitability** | • Project types include Load Relief or Load Relief in combination with Reliability. Other categories have minimal suitability and will be periodically reviewed for potential modifications due to State policy or technological changes. | |
| **Timeline Suitability** | **Large Project** (Projects that are on a major circuit or substation and | • 36 to 60 months |
| | **Small Project** (Projects that are feeder level and below) | • 18 to 24 months |
| **Cost Suitability** | **Large Project** (Projects that are on a major circuit or substation and | • No cost floor |
| | **Small Project** (Projects that are feeder level and below) | • Greater than or equal to $450k |

Con Edison applied its suitability criteria to its 2017 capital work plan to determine the non-wires alternative opportunities. The table below shows the projects that were selected from the capital work plan by first applying the project type category of the Suitability Criteria. Because Con Edison does not have a cost floor for the large projects, all the large projects that had sufficient time to be implemented were selected as potential opportunities and shown in the table below. For small projects, the $450K cost floor was used in addition to the need date to determine the non-wires alternative opportunities.

The table below presents the non-wires alternative opportunities in order of "need date" and also describes the project type, project size and estimated Request for Proposal ("RFP") timing.

| NWA Opportunity Listing | Project Type | Need Date | Project Size | Estimated RFP Timing |
|---|---|---|---|---|
| Water Street - Install Cooling on all Area Substation Transformers | Load relief | 2019 | Large | Project is under engineering review; Solicitation expected prior to Aug. 1, 2017 |
| Water Street - Install additional Cooling on Farragut 345/135kV Transformers | Load relief | 2019 | Large | Project is under engineering review; Solicitation expected prior to Aug. 1, 2017 |
| Cable Crossings (Flushing, Yorkville) | Load relief | 2019 | Small | Solicitation for Flushing are expected by Jul. 1, 2017 |
| Plymouth Street - Install additional Cooling on Farragut 345/135kV Transformers | Load relief | 2020 | Large | Project is under engineering review; Solicitation expected prior to Aug. 1, 2017 |
| Plymouth Street - Uprate Feeders 32072, 32076, 32078 and 32710 | Load relief | 2020 | Large | Project is under engineering review; Solicitation expected prior to Aug. 2017 |
| Part of Ridgewood/Brownsville to Glendale (60 MW) BQDM Traditional Solution | Load relief | 2019 | Large | Solicitation timeline to be determined pending BQDM Extension[6] |
| Vernon to Glendale - Replace Limiting Sections of Cable | Load relief | 2021 | Large | Solicitation timeline to be determined pending BQDM Extension |
| New 138kV Feeder Vernon-Glendale and Newtown and Install 5th transformer at Glendale | Load relief | 2021 | Large | Solicitation timeline to be determined pending BQDM Extension |
| Load Transfer W. 42st No. 1 To Astor | Load relief | 2022 | Large | Solicitations expected by Aug. 2017 |
| Uprate Syn Bus Sections at W. 65th Street | Load relief | 2026 | Large | Project deferred due to decrease in the projected load |

Additionally, there are some projects that were presented as non-wires alternative candidates in Con Edison's 2016 DSIP filing and were selected prior to the determination of the Suitability Criteria. Nonetheless, Con Edison has decided to continue to pursue these projects to

[6]See Note 3, *supra*.

determine where the next set of non-wires alternative opportunities may exist. The details of these projects have been included in the table below.

| Additional NWA Solicitations identified in 2016 DSIP (i.e. prior to current suitability matrix) | Project Type | Need Date | Project Size | Estimated RFP Timing |
|---|---|---|---|---|
| Primary Feeder Relief - Williamsburg | Load relief | 2020 | Small | Solicitations expected by Jul. 2017 |
| Primary Feeder Relief - Columbus Circle | Load relief | 2021 | Small | Solicitation released Apr. 25, 2017 |
| Primary Feeder Relief - Hudson | Load relief | 2021 | Small | Solicitation released Apr. 25, 2017 |

A short description and high level details of the projects listed in the above table are provided below.

***Water Street***

Two projects listed in the table above are associated with the Water Street Substation in Brooklyn. Per Con Edison's analysis, Water Street will need approximately 4 MW of load relief in the year 2019. Water Street substation supplies power to the Williamsburg and Prospect Park networks of the Con Edison system. The details of the network maps can be found on Con Edison's website.[7] The traditional load relief solution involves installing cooling systems on the transformers at Water Street Substation as well as its supply station, Farragut Substation. Currently, Con Edison is performing an engineering review of the project and finalizing the project scope needed to develop the RFP.

[7] https://www.coned.com/en/business-partners/become-a-local-generation-facility

***Cable Crossings: Flushing and Yorkville***

*Flushing Crossing Project*:

The traditional project addresses capacity constraints at six feeder crossings in the Flushing load pocket located in Queens. A map for the Flushing Network can be found on Con Edison's website.[8] The feeders cross multiple geographical obstructions, including the Grand Central Parkway and the Flushing River. Some of the crossing work is underway such that the latter stages of the project will be the focus of the non-traditional solution. This includes six distribution feeders in the Flushing network that are projected to experience a combined peak overload of approximately 7 MW by the summer of 2019. Targeting specific customers supplied by these feeders will allow for load reductions through DER. The heat map representing the area with the greatest impact on these six feeders is currently under development.

*Yorkville Crossing Project*:

This project involves bifurcating feeders at Hellgate Area Station in the Bronx and serving Yorkville Network in Manhattan. These additional feeders emanating from the same station breakers will be routed to Manhattan's Yorkville Network via a new duct system in order to decrease duct occupancy and increase network reliability and feeder ratings. As part of this plan, two new crossings will be created from the Bronx to Manhattan. While the project was classified as system expansion, this project is more importantly needed for risk reduction to enable Con Edison to continue to meet its second contingency reliability design criteria for Manhattan networks and is not a candidate for a non-traditional solution.

***Plymouth Street***

There are two projects listed in the table above associated with Plymouth Street Substation that supplies power to Borough Hall network in Brooklyn. A network level map of

[8] www.coned.com/en/business-partners/become-a-local-generation-facility

Borough Hall network can be seen on Con Edison's website. Per Con Edison's analysis, Plymouth Street will need approximately 6 MW of load relief in Borough Hall Network in the year 2020. The traditional solution involves installing cooling systems on the transformers at Plymouth Street Substation's supply station, Farragut Substation. The first phase of this Plymouth Street project involved transformer dual-speed fan and bus installations to provide additional cooling to the transformer's dielectric fluid to increase the rating of each bank. This work began in 2016 and the upgrade will be completed prior to the summer of 2017. Currently, Con Edison is performing an engineering review of the second phase of the work, listed in the table above, and working on gathering the information needed to develop the RFP.

***Vernon-Glendale Related Projects (BQDM traditional)***

The table shows three projects under review that have customer-sided solutions. All of these are Vernon- and Glendale-related projects and are part of the BQDM portfolio. These traditional projects target the same BQDM area. These projects were originally forecasted to be needed in 2017. However, the expected load demand growth in the Brownsville area decreased due to a combination of factors, including the success of BQDM load reduction initiatives, traditional load transfers, and a decrease in forecast load growth. As a result, the required service date for these traditional infrastructure upgrades has moved back to pre-summer 2021 and the need has changed to 60 MW. This has allowed Con Edison to concurrently examine an alternative option that would permanently displace the planned traditional infrastructure upgrades, potentially at lower cost.

***Primary Feeder Relief***

Traditionally, distribution load relief programs are defined based on a combination of historical experience and forecast load growth and only identify overloaded feeders and

transformers one year in advance to obtain the most accurate forecast and optimize capital spend. Con Edison is taking steps to lengthen the primary feeder relief planning cycle and is interested in testing the deferral concept in areas where feeder loading outlooks indicate potential candidates. The networks of interest for proving this concept were identified in Con Edison's Initial DSIP at Columbus Circle, Williamsburg, and Hudson. Con Edison still considers testing the applicability of the feeder deferral concept in networked systems to be both valuable and informative, and intends to pursue these non-wires alternative solicitations.

***Williamsburg***

Two feeders in the Williamsburg network are projected to experience overloads of approximately 4 MW, operating at emergency ratings, by the summer of 2020. The traditional alternative for this solution would be to build additional conduit systems to accommodate the load growth. Because Williamsburg is a network, there is no one-for-one correlation of impact on the overload due to network configurations.[9] The heat map outlining the impacted area is under development.

***Columbus Circle***

Con Edison's analysis determined that the Columbus Circle network will see overloads in the year 2021. Hence, a reduction of 4 MW from the network by summer 2021 will potentially help address these overloads. The traditional solution is to perform feeder upgrades to help address this need. Alternatively, reducing load at customer locations in the network through implementation of DER could allow for potential load relief in the network. The network overload is expected between 2pm and 7pm with the peak at 6pm.

[9] https://www.epri.com/#/pages/product/000000003002008410/

The map below outlining the network in blue denotes the area where implementation of DER would provide load relief.


The RFP for this project is available on Con Edison's website.

***Hudson***

Con Edison's analysis determined that the Hudson network will see overloads on some of its feeders in the year 2021. Hence, a reduction of 7.1 MWs from the network by summer 2021 will potentially help address the overload. The traditional solution is to perform feeder upgrades to help address this need. Alternatively, reducing load at customer locations in the network through implementation of DERs could allow for potential load relief in the network. The network overload is expected between 1pm and 8pm with the peak at 5pm. The map below outlining the network in blue denotes the area where implementation of DER would provide load relief.


The RFP for this project is available on Con Edison's website.

***Load Transfer W42st No. 1 to Astor Substation***

To avoid overloading the W.42nd St. No. 1 Substation that supplies the Pennsylvania network in Manhattan, 50 MW of load is to be transferred from W.42nd St. No. 1 Substation to Astor Substation prior to the summer of 2022. The traditional solution is to establish a new network that will be supplied from Astor Substation. The new network would be created by carving out the northwest portion of the Pennsylvania network. The main driver of this project is the significant new business load growth in the Pennsylvania Network. This project will be done subsequent to the Pennsylvania Network feeder installation project, which is in progress. This project is currently under engineering review and is a candidate for non-traditional solution. Con Edison is currently working on gathering the relevant information to develop the RFP.

***Uprate Syn Bus Sections at W. 65th Street***

The bus upgrades at 65th street involve either upgrading synchronous bus sections or installing cooling for both synchronous busses to provide greater capacity. This project was originally needed in 2020; however, due to a decrease in the load forecast in the area, the project has been delayed beyond 2021 and Con Edison will not solicit customer-sided solutions for the project at this time but will re-evaluate in the 2018 capital investment review.

**Presentation of Solicitations**

In response to stakeholder requests and to be more transparent in working with the DER community as partners in responding to operational needs, Con Edison will post on its website updated information about its non-wires alternative opportunities, including the size and timing of the need and the status of solicitations. Additionally, the Con Edison 2018 DSIP will also update the non-wires alternative opportunities listings. Stakeholders can find Con Edison's current non-wires alternative offerings as well as active RFP solicitations at this following website: www.coned.com/nonwires

# Appendix 3

## APPENDIX 3: National Grid

### Integrated Planning Process

National Grid updates its Capital Investment Plan ("CIP") annually and files that plan with the Commission. National Grid's most recent CIP was filed January 31, 2017. Embedded within the transmission and distribution ("T&D") planning process that drives the project plans in the CIP is the consideration of non-wires alternatives ("NWAs") solutions for those traditional infrastructure projects. National Grid's current CIP includes a description of NWA considerations used in the development of the 2017 plan. As the NWA process continues to mature, new projects added to future CIP filings will reflect any process changes implemented within that year's planning cycle.

The current process for screening NWA opportunities is presented below and was discussed in detail in a Joint Utilities' document filed with the Commission on March 1, 2017.[1] In consideration of the revised NWA screening criteria, National Grid has reviewed the projects in its current CIP and the remainder of this appendix discusses present NWA opportunities. National Grid has implemented a NWA solution in the Village of Kenmore, located just north of the City of Buffalo, and is currently processing Requests for Proposals ("RFPs") for seven (7) additional NWA projects located throughout National Grid's service territory. National Grid has preliminarily identified seventeen (17) additional projects as having the potential for NWA solutions and they are currently being further reviewed by National Grid's Planning Department to confirm suitability for NWA opportunities. These additional projects, if deemed suitable for

[1] Case 16-M-0411, *In the Matter of Distributed System Implementation Plans* ("DSIP Proceeding"), Joint Utilities Utility-Specific Implementation Matrices for Non-Wires Alternatives Suitability Criteria (filed March 1, 2017).

NWA solicitation, will progress through the NWA sourcing process following the initial seven projects.

**NWA Suitability Criteria**

The table below presents National Grid's current NWA suitability criteria:

| Criteria | Potential Elements Addressed | |
|---|---|---|
| Project Type Suitability | Project types include Load Relief and Reliability. Other types have minimal suitability and will be reviewed as suitability changes due to State policy or technological changes. | |
| Timeline Suitability | Large Project | 36-60 months |
| | Small Project | 18-24 months |
| Cost Suitability | Large Project | Greater than or equal to $1M |
| | Small Project | Greater than or equal to $500K |

National Grid, in conjunction with the other utilities, expects that the suitability criteria will continue to evolve as NWA experience is gained and the process informed by lessons learned.

The following table lists the next seven projects for which National Grid plans to issue RFP solicitations. An eighth project, referred to as Mohawk Drive, was previously identified as a project for a potential NWA solution but that project has been removed from NWA consideration as discussed later herein. The seven projects being progressed are in various phases of National Grid's NWA process and the status of each is presented in the table below with additional detail in the paragraphs that follow the table.

| Project Name/Description | Project Type | Status | Loading Relief Needed | Voltage Type | Project Size | Estimated RFP Timing | Need Timing |
|---|---|---|---|---|---|---|---|
| Baldwinsville | Load Relief | Proposal Review | 4-6 MW | Distribution | Large | N/A | 2023+ |
| Old Forge | Reliability | RFP Posted | 13 MW | Distribution/ Sub-Transmission | Large | RFP Posted | 2023+ |
| Brooklea Dr. | Load Relief | RFP Development | 140 kW | Distribution | Small | May-2017 | 2020 |
| Gilbert Mills | Load Relief | RFP Development | 1.7 MW | Distribution | Small | May-2017 | 2023+ |
| Van Dyke | Load Relief | RFP Development | 6 MW | Distribution | Large | Jun-2017 | 2020 |
| Golah-Avon | Load Relief | RFP Development | 6 MW | Sub-Transmission | Large | Jul-2017 | 2021 |
| Buffalo 53 | Load Relief | RFP Development | 1 MW+ | Distribution / Sub-Transmission | Large | Aug-2017 | 2020 |

***Baldwinsville***

Loading in this area exceeds National Grid's risk threshold for load at risk under contingency scenarios. The area includes two substations and 5-6 overloaded feeders. The Sorrell Hill Substation currently exceeds the National Grid Distribution Planning Guidelines for load at risk and the Lysander Substation is nearing the point at which it will exceed this guideline as well.

At the Sorrell Hill Substation there are up to 827 hours scattered over 113 days during the course of the year when load on the substation transformer may exceed the rating of feeder ties for post-contingency restoration. During the peak load period in the July timeframe there may be as many as 20 continuous hours with some level of load at risk with 24 straight days having at least one hour with some load at risk.

National Grid issued a RFP in January 2017 seeking market solutions for the problem at Sorrell Hill in Baldwinsville. Eleven (11) proposals were received in response to the RFP and National Grid is currently reviewing those proposals.

***Old Forge***

The Old Forge area, including towns located on Route 28 between the Hamlets of Alder Creek and Raquette Lake in the Adirondack Region, is served from a 60 mile radial sub-transmission 46kV line (46kV/13.2kV/4.8kV) and is prone to outages. Last year there were five outages in a two-month span. This sub-transmission line is located in the Adirondack State Park and is of radial design without a back-up source. Based on a fault location, all customers located downstream of the faulted area may experience a long duration interruption. DER solutions are being considered to provide for resiliency in order to bridge the time it takes to repair damage and reenergize the line.

***Brooklea Dr. (Fayetteville)***

This proposed project will address loading on a portion of a distribution feeder due to overloads of the step-down ratio transformer bank serving portions of the Village of Fayetteville, located just east of the City of Syracuse. Loading has increased to a level that the step-down ratio transformer bank is overloaded during peak loading days. Due to the location of the step-down ratio transformer bank there is no physical space to install a larger transformer and

therefore an area voltage conversion is planned as the traditional solution. National Grid will solicit NWA proposals to reduce loading in the area and specifically on an overloaded step-down ratio transformer bank on a Duguid distribution feeder. The ratio transformer configuration is 13.2kV WYE to 4.16kV WYE.

***Gilbert Mills***

Loading on the Gilbert Mills Substation serving the Towns of Schroeppel and Palermo and a portion of the Town of Hastings, located east of the City of Oswego and north of the City of Syracuse, has increased to a level at which it is projected to be loaded to 100% of its normal rating. A single T&D contingency results in approximately 1.7MVA load at risk. National Grid will solicit NWA solutions to reduce the area load in order to maintain or improve reliability performance.

***Van Dyke***

Loading on the substations (*i.e.*, Delmar Substation and New Krumkill Substation) serving portions of the Towns of Bethlehem and New Scotland and portions of the City of Albany has increased to a level at which the load at risk for a single T&D contingency exceeds the risk threshold established in National Grid's Distribution Planning Criteria. Additionally, 11.5MW of expected new commercial and industrial load in the Town of Bethlehem will cause feeder loading beyond normal ratings. National Grid is evaluating alternatives to serve this new load and to reduce the area load at risk to maintain or improve reliability performance. A NWA solution could be a hybrid solution in conjunction with a rebuild of the existing Delmar Substation.

***Golah-Avon***

Sub-transmission lines Golah-North Lakeville #216 and #217 have potential reliability issues. The reliability concerns are low voltage exposures during outages on the 115kV circuits. The area in need is located in a rural area south of the City of Rochester along and to the east of Interstate 390 in Livingston County. There are 4.8kV and 13.2kV distribution stations and circuits supplied from the 34.5kV system. National Grid is seeking NWA solutions to defer reconductoring lines 216 and 217 so that the area loads would not need to be shed for outages on the 115kV network.

***Buffalo 53***

Loading on indoor Station 53 located in the City of Buffalo has increased to a level at which the capacity of the transformers and cables feeding the substation exceed the threshold established in the National Grid Distribution Planning Criteria. The traditional project solution would involve reconductoring and or upgrading the substation with an additional transformer bank. National Grid will be soliciting NWA solutions to reduce loading on existing cables and transformers to prevent overload conditions.

**Other Potential NWA Opportunities**

In addition to the projects listed and described above, the projects below were screened in accordance with National Grid's NWA Suitability Criteria and determined to be appropriate for further NWA consideration. These projects are currently being reviewed by National Grid's Planning Department in more detail to confirm suitability for NWA opportunities. NWA solicitations for these additional projects would follow the seven projects discussed above.

| Project Name/Description | Project Type | Description of Need | Voltage Type | Project Size | Estimated RFP Timing | Need Timing |
|---|---|---|---|---|---|---|
| BEECH AVE CONVERSION NIAGARA FALLS | Load Relief | Distribution feeder projected to be over 100% of summer normal rating. Load Relief needed on distribution feeder. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. | Distribution | Small | Q2 - 2017 | 2019 |
| RAQUETTE LAKE TRANSFORMER UPGRADE | Load Relief | Loading on the Raquette Lake substation transformer serving the Town of Arietta in Hamilton County NY has increased to a level at which that is projected to be overloaded to 100% of its normal rating. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. | Distribution | Small | Q2 - 2017 | 2019 |
| FAIRDALE DSUB | Load Relief | Loading on the Fairdale substation serving the Town of Hannibal has increased to a level at which that is projected to be overloaded to 100% of its normal rating. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. | Distribution | Large | Q2 - 2017 | 2020 |
| NEW CICERO SUBSTATION DSUB & D-LINE | Reliability | In the North Syracuse area, there are significant capacity and outage exposure issues that need to be resolved. Two major substations that need to be relieved are the Pine Grove Substation and the Bartell Road Substation. In addition to the relief needed at these two existing substations, there are existing distribution feeders with thermal overloads that need to be addressed. | Distribution | Large | Q2 - 2017 | 2020 |
| BYRON F1863 - REBUILD /RECONDUCTOR | Reliability | Looking to Increase capacity on existing feeder in the Town of Byron, Genesee County, NY to enable stronger tie capabilities with neighboring feeder. Also, improve voltage conditions on the input side of several regulators which will improve their performance and reduce operational wear. | Distribution | Small | Q4 - 2017 | 2020 |
| CHURCH ST 53 - CNTY HWY 132 CONVRT | Reliability | Loading on the step-down ratio transformer bank serving portions of the Town of Fultonville in Montgomery County NY has increased to a level that the step-down ratio transformer bank is projected to be overloaded during peak loading days. The area being considered for a NWA solution is located in Eastern NY. Load relief downstream of the 13.2kV WYE to 4.8kV Delta step-down ratio transformer. | Distribution | Small | Q4 - 2017 | 2020 |
| NORTH BANGOR CONVERSION (D-LINE) | Reliability | North Bangor is a single ended 34.5/4.8kV distribution substation located in Franklin County, NY. MWh[2] violations are the main driver for this project. There are limited ties in the area and upon failure at North Bangor sub it would be difficult to carry the load long term. | Distribution | Small | Q4 - 2017 | 2020 |
| BUFFALO 23KV RECONDUCTOR - HUNTLEY2 | Load Relief | Load Relief for underground sub-transmission cables located in the City of Buffalo beyond summer emergency ratings based on load projections. | Sub-Transmission | Large | Q1 - 2018 | 2021 |
| CENTER ST 52 - ROUTE 5 REBUILD/CONV | Load Relief | Loading on the step-down ratio transformer bank serving portions of the Town of Fonda, NY has increased to a level that the step-down ratio transformer bank is projected to be overloaded during peak loading days. The area being considered for a NWA solution is located in National Grid's Eastern Division. Load relief downstream of the 13.2kV WYE to 4.8kV Delta step-down ratio transformer. | Distribution | Small | Q1 - 2018 | 2021 |

[2] "MWh violation" as used in this table quantifies contingency risk with a megawatt hour ("MWh") metric calculated by determining the duration that the load is expected to be out of service during peak loading conditions while considering switching and before full restoration.

| Project Name/Description | Project Type | Description of Need | Voltage Type | Project Size | Estimated RFP Timing | Need Timing |
|---|---|---|---|---|---|---|
| EAST PULASKI TRANSFORMER UPGRADE | Load Relief | Loading on the East Pulaski substation serving the Town of Richland in Oswego County NY has increased to a level at which that is projected to be overloaded to 100% of its normal rating. A single transmission or distribution ("T&D") contingency results in approximately 1.5MW load at risk. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. | Distribution | Large | Q1 - 2018 | 2021 |
| LHH - MALLORY 34.5 KV 22 LINE REG. | Reliability | Sub-Transmission (34.5kV) voltage criteria violation during N-1 contingency events. In the area of Oswego County. Low voltage on stations on this Sub-T line during contingency events. Load relief and voltage support required. | Sub-Transmission | Small | Q1 - 2018 | 2021 |
| WATERTOWN NEW 115/13.2 KV SUBSTATION | Reliability | Substation MWh violation -- Includes one substation with two transformer banks in violation of the MWh violation, as well as 2 feeders approaching thermal limits. The Coffeen Substation, located in the City of Watertown in Jefferson County NY, currently exceeds the National Grid Distribution Planning Guidelines for Load at Risk. | Distribution | Large | Q1 - 2018 | 2021 |
| FORBES AVE - NEW SUBSTATION & D-LINE | Load Relief | Loading on the substation and Sub-transmission lines serving the City of Rensselaer has increased. The Rensselaer station is a single bank station, with limited 13.2kV feeder ties. Additionally, 18MW of expected new commercial load in the City of Rensselaer will cause distribution feeder / sub-tranmssion, and station transformer loading beyond normal ratings. National Grid is evaluating alternatives to serve this new load and to reduce the area load at risk to maintain or improve reliability performance. | Distribution / Sub-Transmission | Large | Q4- 2017 | 2021 |
| BAKER ST - INSTALL 2ND XFMR | Reliability | Substation MWh violation The Baker St. Substation, located near the City of Jamestown in Chautauqua County NY, currently exceeds the National Grid Distribution Planning Guidelines for Load at Risk. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. | Distribution | Large | Q2 - 2018 | 2022 |
| BFLO STA 139 - REPLACE TRANSFORMERS | Reliability | Load relief needed on station transformers in Buffalo NY - during N-1 contingency (One Transformer bank out of service). | Distribution | Large | Q2 - 2018 | 2022 |
| WEST SWEDEN - INSTALL NEW STATION & D-LINE | Reliability | Substation MWh violation -- Includes three substations and one feeder approaching its thermal limit. The Brockport, Mumford, and West Hamlin Substations currently exceed the National Grid Distribution Planning Guidelines for Load at Risk. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. These stations are in National Grid's Western Division. | Distribution | Large | Q2 - 2018 | 2022 |
| WHITAKER DSUB | Reliability | Substation MWh violation -- The Whitaker Substation, located in the Town of Volney in Oswego County NY, currently exceeds the National Grid Distribution Planning Guidelines for Load at Risk. National Grid is evaluating alternatives to reduce the area load in order to maintain or improve reliability performance. | Distribution | Large | Q2 - 2018 | 2022 |

In addition to the projects set out in the above table that National Grid continues to evaluate for suitability for NWA solutions, a number of other projects that passed an initial

NWA screening review have been removed from consideration as the result of further analysis. NWA solutions will not be pursued on the following projects for the reasons described below.

***Mohawk Dr. Ratio, Firehouse Rd. New Feeder, Pawling Ave. Conversion, Haque Rd. 52 Conversion, Weibel 56 Rebuild, Central Region - Convert 29351, and Galeville Station Rebuild and Galeville Line Conversion***

It has been determined that the scope of the traditional project solution will address needs beyond load relief. To achieve the reliability desired, infrastructure enhancements and/or line extensions are required to create a distribution feeder tie to improve post-contingency service restoration.

***Buffalo 23 Reconductor Underground Cables 1, 2, 3, 19 and 315***

The timing of this project has been accelerated, and due to the near-term need date, it fails the Timeline Suitability screen of National Grid's NWA Suitability Criteria. The project is needed in 2018.

***McCrea Station – Expand Station and Add Four Feeders***

This project will utilize increased capacity at one substation to address several asset condition issues through the retirement of four neighboring substations. The asset condition issues are too significant to defer by addressing loading concerns alone. In that this project addresses asset condition issues, it fails the Project Type Suitability screen of National Grid's NWA Suitability Criteria.

***Pottersville 51- Rebuild and Convert East Shore Dr.***

The driver for this project is relay/fuse coordination rather than load relief. A large portion of this feeder section (East Shore Dr.) is already built to 15kV standards therefore the majority of the project scope is voltage. An NWA solution is unlikely to address the system protection needs to ensure safety and reliability.

***W. MILTON TAP – 34.5KV NEW LINE***

After further assessment, this project fails the Project Type Suitability screen of National Grid's NWA Suitability Criteria. This is an asset condition project.

**Additional Information**

Information regarding these NWA opportunities will continue to be enhanced as project reviews progress. The list of National Grid's potential NWA opportunities will be maintained and available on National Grid's System Data Portal which is available at: http://ngrid.maps.arcgis.com/apps/MapSeries/index.html?appid=4c8cfd75800b469abb8febca4d5dab59

Monthly meetings/conference calls are held for stakeholders to provide status updates on the listed projects and to introduce any newly added projects.

**Procurement**

RFPs will be posted in National Grid's Ariba system, on the Commission's website, and in the near future, a Joint Utilities' website. Parties interested in bidding on National Grid NWA opportunities should contact Derek Salisbury at **derek.salisbury@nationalgrid.com**. NWA projects, status, location, and other applicable information will be maintained on National Grid's System Data Portal for which the link is provided above.

# Appendix 4

## APPENDIX 4: NYSEG & RG&E

### NWA Suitability Criteria

| Criteria | Potential Elements Addressed |
|---|---|
| **Project Type Suitability** | • Load Relief projects that do not involve a customer contribution or have a specific customer in-service date that is sooner than the timeline suitability criteria of 36 months.<br>• Reliability projects and/or a combination of reliability and load relief projects. |
| **Timeline Suitability** | • Minimum of 36 months to time of need. |
| **Cost Suitability** | • Projects with construction cost greater than $1,000,000. |

### Current Capital Investment Plan

The NYSEG/RG&E NWA Group utilizes the Companies' CIP as the basis for developing the list of potential NWA projects. Distribution and Transmission projects that represent electric Load Relief and/or Reliability needs are selected from the CIP, and the Company-specific Suitability Criteria listed above are applied to the list to select those projects that meet all three criteria (type of project – load relief and/or reliability; 36 months or more until time to need; and $1,000,000 or greater cost to implement). The result of the application of the Suitability Criteria is a list of projects that may be amenable to NWA projects. That list is ranked based on time of need, with the projects closest to the time of need placed at the beginning of the list. The NWA Group schedules RFPs for the projects at the beginning of the list, based on time of need and resources available to complete the RFPs.

For 2017, the CIP which was filed at the NY PSC may be found on the search page at the following URL: NYSPSC - NYSEG - RG&E 2017 CIP Filing. The list of projects that utilized this CIP and passed the 2017 Screening Criteria is included below.

**Current NWA Opportunities**

| Project Name/Description | Project Type (Load Relief/Reliability) | Need Timing (>=36 Months) | Cost* (>=$1,000,000) | Estimated RFP Timing/Status |
|---|---|---|---|---|
| Java 2nd Transformer and 12kV Conversion** | Load Relief & Reliability | 2019 | $ 489,115* | RFP Complete; Performing Final Analysis |
| Station 43 - Replace #3 and #4 Transformer Banks | Load Relief & Reliability | 2019 | $4,500,000 | RFP Complete; NWA Solutions Determined Not to be Cost-Effective (see description below) |
| Gardenville, Add 3rd 230/115 kV Transformer | Load Relief | 2021 | $14,342,962 | Q3 2017 |
| Stillwater Substation - Upgrade Transformer to 14MVA | Load Relief | 2022 | $ 3,000,000 | Q3 – Q4 2017 |
| Station 51 transformer/facilities upgrade and secondary source addition | Load Relief | 2022 | $ 9,316,000 | 2018 |
| Hilldale 115kV source, transformer bank upgrade, 2nd 12kV dist circuit | Load Relief | 2024 | $18,708,000 | 2018 |
| Station 46 - Replace #1 and #3 Transformer Banks | Load Relief | 2025 | $12,920,000 | 2018 |
| Orchard Park - Add a 2nd Transformer Bank | Load Relief | 2025 | $ 8,677,927 | 2018 |
| Old Fall substation - Install 2nd LTC Transformer | Load Relief | 2026 | $ 3,500,000 | 2019 |
| Station 192 transformer/facilities | Load Relief | 2026 | $ 3,440,000 | 2019 |

| | | | | |
|---|---|---|---|---|
| upgrade | | | | |
| Holland Transformer Replacement | Load Relief | 2026 | $ 115,306* | 2019 |
| Crafts - Add 2nd Transformer and 4th 13.2kV Circuit Position | Load Relief | 2027 | $ 1,666,009 | TBD |
| West Davenport Sub - Replace sub transformer with non-LTC 7.5/10.5MVA unit | Load Relief | 2037 | $ 6,503,549 | TBD |
| Sackett Lake Sub - Replace Transformer with 7.5MVA Unit & Convert Distribution to 12.5KV | Load Relief | 2032 | $ 500,000* | TBD |
| Station 117 - Replace #1 Transformer Bank and convert 3 circuits to 12kV operation | Load Relief | 2030 | $19,100,000 | TBD |

*The costs shown here are only those dollars from the filed CIP for calendar years 2017 - 2021. Capital Plan dollars do not in all cases include the full project cost if additional project expenditures are expected in years 6+. For example, the Sackett Lake Sub - Replace Transformer project and the Holland Transformer Replacement project total costs are expected to exceed the $1,000,000 Suitability Criteria cost threshold.

**Because the Java Substation project is already in process of securing an NWA, the full project cost is not included in the filed Capital Plan.

**Additional Details about Near-term NWA Opportunities**

***Java Substation – Add 2nd Transformer and 12kV Conversion***

Java Substation, located in NYSEG's Lancaster Division, is a 34.5-4.8 kV substation with two distribution feeder circuits that serve approximately 1,665 customers. The existing 5 MVA bank has exceeded the nameplate rating and one circuit has significant load growth. The NWA project to postpone the transformer replacement was initiated with an RFP in 2016. If a cost-effective solution is developed, NWA resources to defer the transformer replacement project are expected be in service by January 2019.

***Station 43 Substation - Replace Transformer Banks***

Station 43 Substation, located in the Rochester RG&E distribution area, consists of two 6.25 MVA transformer banks, each of which feed three circuits and a total of 6,356 residential and commercial customers. The older transformers have been near or over their nameplate ratings and loss of either transformer places the remaining transformer in an overload situation. The NWA project to postpone the traditional transformer project was initiated with an RFP in June 2016. However, after receipt and study of developer proposals, and recognizing the continued increasing load growth at the substation, the Company determined that the traditional solution was more cost- and time-effective, and a NWA solution was no longer pursued.

***Gardenville Substation – Add Transformer***

The Gardenville Substation, located in NYSEG's Lancaster Division is composed of two 230/115 kV transformers serving 1,517 customers. The transformers have experienced low bus voltages and thermal overload. The traditional wires project is to install a third 230/115 kV transformer at the Gardenville Substation and operate it in parallel with the two existing transformers. NYSEG plans to release an RFP requesting NWA solutions for this project in Q3 2017.

***Stillwater Substation - Transformer Upgrade and Voltage Conversion***

Stillwater Substation, located in NYSEG's Mechanicville Division, is a 2.8 MVA substation transformer that has been near or over its nameplate rating. Approximately 1,270 customers are served by this substation. The traditional wires project is to upgrade the Stillwater Substation with a new 34.5-4.8 X 12.5 kV, 10/12.5 (14) MVA, LTC transformer and convert approximately two miles of distribution circuit to 12.5 kV from the substation to Colonial Drive. NYSEG plans to release an RFP requesting NWA solutions for this project, in late 2017.

***Station 51 Substation - Transformer Upgrade and Secondary Source Addition***

Station 51 Substation, located north of Rochester in RG&E's distribution area, is a reliability improvement project. The station provides service to customers with significant loading. If the station transformer were lost the area distribution would not be able to support the load during the summer peak. This project will increase station capacity and develop second source contingency. RG&E plans to release an RFP requesting NWA solutions for this project in 2018.

***Hilldale Substation – Transformer Bank Upgrade and Addition of Distribution Circuit***

Hilldale Substation, located in the NYSEG's Liberty Division, is composed of three 34.5/12.5kV 10.5MVA substation transformers loaded to near their nameplate rating. The substation now serves approximately 2,608 customers and significant building and load growth is planned for the area. The substation has experienced many outages on the 34.5 kV sub transmission line. The traditional wires project is proposed to relieve transformer loading by upgrading the existing substation transformer to a 115/12.5kV 1-12/16/20MVA LTC unit, converting the existing 4.8 kV circuit to 12 kV operation and adding a 2nd 12.5 kV feeder. This transformer will be served off the 115 kV rather than the 34.5 kV transmission system. NYSEG plans to release an RFP requesting NWA solutions for this project in 2018.

***Station 46 Substation – Transformer Bank Replacement***

Station 46 Substation located in an urban area of Rochester in RG&E's distribution service area, contains two 6.25 MVA transformer banks on which the loading has reached the upper limits of their nameplate ratings. The station's six distribution circuits serve approximately 6,356 residential and commercial customers. Presently, loss of either transformer places the

other in a situation where it is loaded well above its rating. The traditional wires project is to replace transformer banks #1 and #3 at Station 46 with two new 34.5-4.16x12.5 kV, 13.4/17.9/22.4 MVA transformer banks. RG&E plans to release an RFP for NWA solutions in 2018.

***Orchard Park Substation – Transformer Bank Upgrade***

Orchard Park Substation, located in NYSEG's Lancaster Division, is a 34.5-4.8 kV station with three 4.8 kV distribution circuit feeders, serving approximately 3,326 customers. The existing 9.38 MVA transformer bank has been near to or over its peak nameplate rating. The traditional wires project is to replace the existing 34.5-4.8 kV, 9.38 MVA transformer bank with two new 34.5-4.8x12.5kV, 12/16/20 MVA LTC Transformer Banks, convert the three existing 4.8 kV distribution feeder circuits 285,286,287 to 12 kV operation and establish a fourth 12 kV circuit. NYSEG plans to release an RFP for NWA solutions in 2018.

**Additional Information**

NYSEG and RG&E will provide additional information regarding NWA potential projects for which NWA RFPs will be released in future NWA informational filings and postings.

# Appendix 5

## APPENDIX 5: O&R

O&R's annual electric delivery system planning process is generally consistent with the Joint Utilities' process as described above.

With respect to system load forecasting, in addition to the system level forecast O&R produces a bottom-up forecast analysis for each substation and circuit, which considers numerous inputs and load modifiers, reflecting a more granular analysis of growth and projected local area operating conditions.

O&R identifies current and future projected capability deficiencies through the application of O&R's electric delivery system design standards and reliability risk assessment methodologies (*e.g.*, "design standards"). The design standards guide the assessment and determination of acceptable system operating performance with respect to risk for both ability to serve load, and for attendant customer hours of outage exposure. Projects identified with deficiencies that are primarily load growth driven, and/or load growth with certain reliability deficient aspects, are the most likely to pass O&R's NWA Suitability Criteria.

**Capital Investment Plan**

O&R starts its planning process immediately following the summer operating period each year, and completes its capital planning and optimization process by the following April/May timeframe. Initially, O&R identifies and evaluates system needs and options for resolving the needs for project effectiveness, cost, timing and risk. Once this initial assessment is completed by April/May, the results of the planning and optimization process become the proposed capital work plan. This proposed capital work plan undergoes a lengthy and iterative review process, typically lasting up to six months, before it receives corporate approval in November, and is

deemed the final Capital Investment Plan ("CIP"). This final CIP includes the following year's annual capital budget as the initial year of a five-year capital forecast.

Moving forward, and in an effort to provide additional advanced notice to the marketplace of upcoming potential NWA opportunities, O&R will modify its planning process. Specifically, O&R will extend its planning horizon to include a ten-year outlook; this will start with the planning cycle that initiates after the 2017 summer operating period. As part of its capital work plan review process, O&R is committed to assessing the proposed traditional capital infrastructure projects for potential NWA opportunities in order to provide timely identification and communication of the results. For the NWA opportunities identified in this appendix, O&R used the planning process work plan results most recently completed after the summer of 2016 operating period.

**NWA Suitability Criteria**

On March 1, 2017, O&R provided utility-specific guidance for the criteria establishing its NWA Suitability Criteria framework.[1] These criteria represent an early assessment and indication of whether DER solutions will have the highest chance for success and should be considered as potential alternatives to traditional infrastructure projects. O&R's NWA suitability matrix is provided below.

[1] Case 16-M-0411 – *In the Matter of Distributed System Implementation Plan*, Joint Utilities Utility-Specific Implementation Matrices For Non-Wires Alternatives Suitability Criteria (filed March 1, 2017).

| Criteria | Potential Elements Addressed | |
|---|---|---|
| **Project Type Suitability** | • Project types include Load Relief or Load Relief in combination with Reliability. Other categories have minimal suitability and will be periodically reviewed for potential modifications due to State policy or technological changes. | |
| **Timeline Suitability** | **Large Project** (Projects that are on a major circuit or substation and above) | • 36 to 60 months |
| | **Small Project** (Projects that are feeder level and below) | • 18 to 24 months |
| **Cost Suitability** | **Large Project** (Projects that are on a major circuit or substation and above) | • No cost floor |
| | **Small Project** (Projects that are feeder level and below) | • Greater than or equal to $450k |

O&R applied the above criteria to its capital work plan to determine the NWA opportunities represented in the table below.

**Identified NWA Opportunities**

| Project Name/Description | Project Type | Project Size | Estimated RFP Timing[2] |
|---|---|---|---|
| Monsey | Load Relief & Reliability | Large | Q3 2017 |
| Pomona | Load Relief | Large | Q4 2017 |
| West Haverstraw 27-3-13/27-4-13 | Reliability | Large | Q2 2018 |
| Blooming Grove | Load Relief & Reliability | Large | Q4 2018 |
| Sterling Forest 67-1-13 (Tuxedo Park) | Load Relief & Reliability | Small | Q3 2019 |
| West Warwick | Load Relief & Reliability | Large | Q3 2019 |
| Mountain Lodge Park 76-4-13 (Blooming Grove) | Load Relief & Reliability | Small | Q4201920 |

A short description and high level details of these potential NWA projects and areas are provided below.

***Monsey***

The Monsey Substation (#44) is located in the hamlet of Monsey in the town of Ramapo in Rockland County. The area is experiencing significant residential growth that has led to highly loaded circuits and substation transformer banks, resulting in an expected violation of O&R's distribution design standards under normal and contingency conditions. O&R's traditional solution is to construct a new substation with the larger capacity of two 50 MVA transformer banks and additional circuits to serve the growing load, provide for contingency needs, and meet design standards. Substation improvements are needed beginning in 2019, with capacity relief for approximately 0.5 MW to be implemented annually during 2017 to 2019. To

[2] This indicates the estimated timeframe for the first RFP. Depending on the geographical area, MW need, and/or timing of the need, O&R could issue more than one RFP for an NWA opportunity. If O&R determines that an opportunity requires more than one RFP as more information becomes available, and/or it analyzes submissions responsive to previous RFP(s), O&R will update expected RFPs timing through appropriate mechanisms (*i.e.*, O&R website, REV Connect, and/or the Joint Utilities website).

further defer the substation upgrade, approximately 2.5 to 3.0 MW would be needed by 2021, depending on actual future growth. These capacity requirements will be increased by a reliability factor to provide equivalent reliability of the traditional solution. O&R conducts an annual planning cycle to monitor substation needs and will adjust capacity requirements based on actual growth, block load additions and other factors. O&R expects to release the first RFP requesting load reduction solutions in the third quarter of 2017. The specific Monsey distribution circuits approximated by the geographical area, are defined to be north of Airmont, east of Viola, west of Spring Valley and south of New Hempstead. The details of the system maps are available on O&R's website.[3]

***Pomona***

The Pomona area includes customers who are served by circuits originating from the New Hempstead, West Haverstraw, Stony Point and Tallman Substations, as well as the Mobile Transformer in service at the future Little Tor Substation site. This area has experienced load growth that has caused existing circuits to failO&R's design standards.[4] There is potential for significant new business load growth in this area in the next few years that will continue to exacerbate operating risk. There are several large new business projects being proposed in this Pomona load pocket area that could add well over 2,000 housing units and other block load growth.

In order to meet the distribution planning criteria and significantly improve the electric delivery system reliability, O&R has identified the new Pomona Substation project as the traditional infrastructure solution. This project proposes the installation of two 50 MVA – 138/13.2kV transformer banks with Load Tap Changers ("LTC"), which will provide sufficient

[3] https://www.org.oru.com/en/business-partners/vendors-service/supply-chain
[4] Case 14-M-0101 *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Orange & Rockland Initial Distributed System Implementation Plan (filed June 30, 2016), pp. 52-68.

capacity for already developed and future load growth in the Pomona area, and provide relief and improved backup to the New Hempstead, Tallman, West Haverstraw, and Stony Point Substations.

O&R has determined that 1.2 MW of load reduction by 2019 will satisfy current circuit contingencies. The present schedule for the projected new business load, in addition to the native load growth in the Pomona area, is expected to require approximately 6.0 MW of load reduction by 2025. These capacity requirements will be increased by a reliability factor to provide equivalent reliability of the traditional solution. O&R conducts an annual planning cycle to monitor local area needs and will adjust capacity requirements based on actual growth, block load additions and other factors, as necessary. O&R expects to release an RFP in the fourth quarter of 2017,[5] requesting load reduction on specific area distribution circuits approximated by the geographical area defined to be from the Palisades Parkway west to South Route 202, Viola Rd to Grand View Avenue, and New Hempstead Road North. As noted above, the details of the system maps are available on O&R's website.

***West Haverstraw Area – Distribution Circuit Relief***

The West Haverstraw Substation (#27) is located in the Village of West Haverstraw, in the Town of Haverstraw in Rockland County. A portion of the area served from this substation is experiencing both commercial and residential load growth due to a recent multi-million dollar revitalization project that is currently underway in the Village of Haverstraw.

The Village of Haverstraw is served from three 13.2 kV distribution circuits. Two of these distribution feeders are constructed as a double circuit spacer construction pole line for

[5] O&R conducted a Request for Information ("RFI") for the Pomona Distributed Energy Resources program in Q2 of 2015 (*i.e.*, prior to stakeholder engagement on DER Sourcing and the refinement of the NWA procurement processes).

approximately one mile exiting the substation. An interruption event occurring on this portion of the double circuit feeder can require the de-energization of both feeders in order to expedite the repairs. For this described contingency, and during peak summer loading periods, the remaining area circuit cannot support the entire Village of Haverstraw load.

O&R's traditional solution is to construct a new underground circuit from the West Haverstraw Substation into the load area. The scope of the NWA will be to reduce the loading on three area circuits to improve transfer capability during contingency scenarios. To defer the capital project, O&R determined that it will need to implement approximately 5.0 MW of capacity reduction by the summer of 2021. These capacity requirements will be increased by a reliability factor to provide equivalent reliability of the traditional solution. O&R conducts an annual planning cycle to monitor local area needs and will adjust capacity requirements based on actual growth, block load additions and other factors, as necessary. O&R expects to release an RFP in the second quarter of 2018, requesting load reduction on specific area distribution circuits approximated by the geographical area defined to be from south of Railroad Avenue in the Village of West Haverstraw to the Hudson River and the entire Village of Haverstraw. As noted above, the details of the system maps are available on O&R's website.

***Blooming Grove***

The Blooming Grove Substation is a single bank substation with a 25 MVA, 69/13.2 kV transformer. This substation serves an area at an extremity of O&R's service territory, serving 6,505 customers. Due to already realized load growth and limited backup, the area distribution circuits are approaching the point of failing design standards and were included in O&R's top 20 worst performing circuits during 2016. This single-bank station only has two high-exposure limited capacity distribution ties to adjacent stations. In the event of a transformer bank

contingency, a large portion of the load of the existing substation would be out of service until installation of a mobile transformer. The resulting customer-hours of interruption exceed risk exposure, and fail O&R's Distribution Design Standards.

O&R's traditional solution is to retire the existing substation and construct a new substation consisting of two (2) 35 MVA transformer banks and additional distribution circuits by 2023. In order to defer this traditional infrastructure project, O&R had determined that approximately 15.5 MW of capacity reduction is needed by 2021. These capacity requirements will be increased by a reliability factor to provide equivalent reliability of the traditional solution. O&R conducts an annual planning cycle to monitor station needs and will adjust capacity requirements based on actual growth, block load additions and other factors, as necessary. O&R expects to release an RFP in the fourth quarter of 2018, requesting load reduction on all of the Blooming Grove circuits served from the substation that would be the geographic area east of Craigville Road to Clove Road, and South Route 94 to Clove Road. As noted above, the details of the system maps are available on O&R's website.

***Sterling Forest 67-1-13(Tuxedo Park)***

The Village of Tuxedo Park is a gated community of approximately 420 customers located in southern Orange County. The majority of the distribution system inside the park is 2.4 kV and is supplied from (4) – 1500kVA, 13.2/2.4 kV step transformer banks. The step transformer bank at the main gate and the south gate are capable of providing 100 percent backup for each other (with assistance from the north gate (Warwick Brook Road) step transformer bank). The west gate step transformer bank (Mountain Farm Road) and north gate step transformer bank also tie, but are unable to provide 100 percent backup at peak time due to

thermal and voltage issues. In the event of a failure of the Mountain Farm Road step transformer banks, the Warwick Brook Road step transformer bank can only provide 32.8 percent backup. For a loss of the Warwick Brook Road step transformer bank, Mountain Farm step transformer bank can only provide approximately 22.0 percent backup at peak time. Because the area is 2.4 kV, the current rating of the devices and primary conductor limit the rating of the step transformers.

The traditional solution for the area is to install a 13.2 kV tie through the park. This would be a Hendrix spacer cable system to reduce the impact of tree trimming and decrease the probability of tree-related outages from the higher voltage. The 13.2 kV "backbone" will allow the area described above to have 100 percent backup with smaller 2.4 kV areas fed radially from step transformers. In the area of Tower Hill Road, a new 13.2/2.4 kV step transformer bank will be installed that will provide relief/backup to the main gate step. Due to the costs of these projects, an NWA is being considered. The goal of the NWA is to reduce the load in the targeted areas by 746 kW at peak time. This reduction would allow the Warwick Brook Road and Mountain Farm Road steps to provide 100 percent backup at peak time.

NWAs to be implemented in the Tuxedo Park area will seek to provide capacity reductions of 746 kW by 2021. Acceptable DER/NWA plans must include appropriate diversity to reliably achieve the required capacity/demand offsets. O&R expects to release an RFP in the first quarter of 2019.

***West Warwick***

The Wisner Substation (#80) is located in Warwick, in Orange County. The substation serves the majority of the load west of Ball Road toward the New Jersey border, Pine Island, Village of Warwick and parts of Florida in New York. In total, the substation serves 7,624

customers. The substation is a two transformer bank substation with five 13.2 kV distribution circuits that feed the area. The substation has multiple operating limitations, such as non-LTC banks, bus rating limitations (1200 amps), no transmission breakers, and both substation transformer banks are served from the same 69 kV bus. In the event of a transformer bank or bus failure, the entire Wisner load pocket cannot be restored by surrounding feeders without one of the transformer banks being in service and a mobile transformer installed. Additionally, one of the five distribution circuit feeders served from the substation fails the distribution design standard.

O&R's traditional solution is to construct a new substation with two 50 MVA transformer banks, and additional distribution circuits to serve the growing load in West Warwick, Pine Island and Florida areas to be in-service by 2025. The traditional solution would solve the load relief and meet substation contingency and distribution design standards. Additional benefits of the substation include load relief and improved reliability and contingency back up for Westtown, South Goshen and Chester Substations, as well as the retirement of Pine Island Substation.

To defer the capital project, O&R determined that approximately 7.0 MW of capacity reduction will need to be implemented by the summer of 2022. These capacity requirements will be increased by a reliability factor to provide equivalent reliability of the traditional solution. O&R conducts an annual planning cycle to monitor local area needs and will adjust capacity requirements based on actual growth, block load additions and other factors as necessary. O&R expects to release an RFP in third quarter of 2019 requesting load reduction on the Wisner distribution circuits serving load predominantly west of the existing substation.

***Mountain Lodge***

Mountain Lodge Park is a community of 772 customers located near Clove Road in the Town of Monroe, in Orange County. The distribution system into Mountain Lodge Park is supplied from two separate 3 – 500 kVA, 13.2/4.8 kV step transformer banks located at each entrance. There are no other paths into Mountain Lodge Park to establish additional circuit ties. In 2017, for a loss of one step transformer bank at peak loads, the remaining step transformer bank can only pick up approximately 81.9 percent of the Park load (approximately 139 customers out of service). By 2022, the percent backup decreases to 81.1 percent (approximately 153 customers out of service).

O&R is currently considering projects that will convert sections of the supply voltage of Mountain Lodge Park in order to establish a 13.2 kV tie that will provide 100 percent backup in the event of a contingency on one feed. Due to the costs of these projects, O&R is also considering an NWA. The goal of the NWA is to reduce the load in Mountain Lodge Park by approximately 280 kW at peak time. This reduction would allow the remaining step bank to support the entire Mountain Lodge Park load and provide 100 percent contingency.

NWAs to be implemented in Mountain Lodge Park will seek capacity reductions on the two 13.2/4.8 kV step transformer banks of 280 kW by 2022 to meet the expected load growth and defer traditional infrastructure investment. This amount of reduction will allow 100 percent of the load area to be supplied from one step transformer bank while remaining under the transformer nameplate rating. Acceptable DER/NWA plans must include appropriate diversity to reliably achieve the required capacity/demand offsets. O&R expects to release an RFP in the fourth quarter of 2019.