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DISTRIBUTION ENGINEERING
System Design Department

EOP-5506
REVISION 0

Utility Process for Distributed Energy Resource Interconnections

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TARGET AUDIENCE:	EXTERNAL CUSTOMERS REGIONAL, CUSTOMER, AND DISTRIBUTION ENGINEERING ENERGY SERVICES
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1.0 Purpose

- 1.1** This guide has been prepared by Con Edison Company of New York, Inc. (“Con Edison”, the Company/Utility) for customers who are planning to install Distributed Energy Resources (DER) within the Con Edison territory and the project is outside the purview of the Standardized Interconnection Requirement (SIR) process; or seeking to participate in the New York Independent System Operator (NYISO) Market; operating in parallel with and/or desiring backup supply from the Company’s electric distribution system.
- 1.2** Interconnection of large generation may require a customer high tension substation or a 480V multibank installation. This guide provides a high-level, non-technical introduction to the sequence of events involved in the construction of a high-tension substation or 480V multibank installation, and the interconnection process for DER.
- 1.3** This guide is a companion to Con Edison’s Company specifications (see Section 9.0), which provides detailed technical requirements. This document is not intended as a design specification or an instruction manual.
- 1.4** This document is for informational, general guidance purposes only and Consolidated Edison Company of New York shall not be held liable for indirect, special, incidental, punitive, or consequential damages of any kind including loss of profits, arising under or in connection with the use of this information guide.
- 1.5** For tariff related concerns, please review the Con Edison Public Service Commission (PSC) approved tariff and Federal Energy Regulatory Commission Open Access Transmission Tariff (FERC-OATT) tariff (see Section 9.0).

2.0 Application

Customers seeking to interconnect DER in parallel to the Con Edison system and following the Utility Process shown in Exhibit E.

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3.0 DER Interconnection Design Options for Service

- 3.1** For most interconnections of DERs, the voltage level, configuration, and design will be dictated by the type of distribution system to which it is connected. Con Edison evaluates the design and construction of the substation or service so that it will not have an adverse impact on the electric distribution system. The Company typically extends, reinforces, adds and/or adjusts equipment as needed to safely and reliably provide service. The Company may extend service to a manhole, splice chamber, vault, or pole at the customer property line. The Company does not allow construction of dedicated distribution feeder lines for DER projects. The company will take into consideration the customer's request for high tension or low tension however the company will ultimately decide the interconnecting voltage class and whether the service will come from the underground network or non-network distribution.
- 3.2** Generally, for high tension service, the Company owns and maintains its feeders up to the property line manhole, splice chamber, vault, or pole, and the customer will design, install, own, operate, and maintain all equipment downstream from the property line termination point (ex: manhole or vault), including cables, circuit breakers, transformers, and associated equipment. For customers receiving low tension service, the company maintains ownership of company provided equipment. For more information, please refer to current approved [electric tariff](#).
- 3.3** The city of New York prevents non-emergency street excavations during the Winter holiday period to minimize traffic disruptions. The Company does not typically perform non-emergency work on primary feeders between May 15 and September 15. Customer property line manholes need to be completed before the ducts can be built for the extension of primary feeders to the customer. The customer should ensure construction of property line manholes are completed in time to allow the Company to build the necessary ducts before the aforementioned times.
- 3.4** The customer is expected to understand and comply with all applicable local, state, and federal requirements to build their facility. The Company cannot waive any requirements of governmental oversight entities. The Company works with the customer to select a convenient position for the Point of Entry (manhole, splice chamber, vault, or pole) to minimize the amount of street construction needed to extend service to the customer.

4.0 DER up to 10MW

Projects up to 10MW range may require 480V installations. The Company's customer engineering department determines if 480V service is required in accordance with the Company's specifications and tariff rate.

- 4.1** The customer will be required to design, procure, and install the 480V installation to meet all applicable codes, laws, and Company specifications.
- 4.2** Services requiring installation of transformers are complex and generally require 18-24 months from the New York City Department (NYCDOT) initial approval/reception of allocation drawings to completion. This time frame provides 8-10 months for design and 10-14 months for construction. The amount of time for installations may vary and the schedule is driven by the customer.
- 4.3** A 480V service installation consists of a collector bus that parallels the generating equipment and network protectors and associated relays that provide protection and isolation from faulted equipment. This allows loads to continue to be serve uninterrupted. Each takeoff supplies equipment that is independent of the other takeoffs. See **Exhibit A**.

5.0 Network High-Tension Service

For projects 10MW or greater, the Company may require High-Tension service. Con Edison provides 3-Phase, high tension service customers at a nominal voltage of 13kV, 27kV or 33kV depending on location. Con Edison does not typically allow projects of this size on the Company's 4kV system.

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- 5.1** High-tension services generally require 18-24 months from receipt of the application to completion. This time frame provides 8-10 months for design and 10-14 months for construction. The amount of time for installations may vary and the schedule is driven by the customer.
- 5.2** The customer will be required to design, procure, install and operate the high-tension installation to meet all applicable codes, laws, and Company specifications.
- 5.3** A parallel (4) feeder high tension service can be seen in **Exhibit B**. In this configuration, a customer collector bus parallels generating equipment. In the event of a feeder failure, relay protection isolates and protects the system from faulted equipment.
- 5.4** This configuration allows a large generator(s) and/or load to continue to be served uninterrupted. Depending on size of generation connected, between two and six feeders may be required.
- 5.5** Other considerations such as the “contingency design” and the paralleling and reliability requirements can impact the number of primary distribution feeders and the complexity of the design requirements. Refer to EO-2022 & EO-2115 for technical details.

6.0 Non-Network High Tension Service

For Non-network Projects, the Company may provide a service to High Tension Metering Equipment (HTME) under EO-10215.

- 6.1** The customer will be required to design, procure, install the HTME installation to meet all applicable codes, laws, and Company specifications.
- 6.2** For a typical High Tension metering equipment installation (EO-10215), see **Exhibit C**. Fault protection and isolation are provided by devices as shown.

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7.0 Project Management, Communication & Coordination

- 7.1** The Company will appoint a Customer Project Manager (CPM) who will function as the liaison between the customer and the Company. The CPM will work to clearly communicate the requirements of each department to the customer and to direct the customer's questions to the appropriate internal department that can provide the answer. In some cases customers may request the CPM provide regular updates with a Con Edison program manager when the project is being built to participate in that program.
- 7.2** While the customer may delegate the daily management of the project to a consultant, we encourage the customer to periodically meet with the CPM to discuss the progress of the project.
- 7.3** Several departments within the Company will be involved in the process of approving and energizing a new service with a DER project. Some departments will evaluate the customer's design while others will review system updates to provide service. Your CPM will guide you through Con Edison's internal process. For example, the CPM will work so that the customer is aware of important scheduling constraints. The company does not schedule planned or new business work during the summer season that requires medium voltage feeder (circuit) outages, as this is the period of peak electricity demand. Similarly, scheduled/planned work may be impacted by system emergencies that may delay necessary feeder outages for your project. Through the CPM, the customer and company will work together to ensure that tasks are scheduled and completed with minimal delays.

8.0 Process and Sequence

8.1 Initial Communication to Con Edison from Applicant If Seeking to Participate in the NYISO Market.

8.1.1 Applicant contacts Con Edison at dgexpert@coned.com

8.2 The Inquiry is reviewed by the Utility to determine if under FERC jurisdiction.

8.2.1 Technical staff from the Utility will contact the applicant to discuss the scope of the interconnection with the potential applicant and advise of next steps to determine if a project is FERC jurisdictional and where to submit an interconnection application.

8.3 Potential Applicant Files an application.

8.3.1 The potential applicant submits an application to the Utility via the [Utility Process Application Portal](#).

8.3.2 Utility shall review the application to determine whether it is complete in accordance with Utility requirements, and whether any additional information is required from the applicant. The Utility shall notify the applicant in writing within fifteen (15) Business Days following receipt of the application.

8.3.3 The applicant will be required to submit the following documents:

- a. One Line / 3 Line Diagram
- b. Proposed Grounding Scheme
- c. Site Plan Showing Service Ducts and Manholes
- d. Customer Letter of Authorization
- e. Site Control Agreement
- f. Spec Sheets (CPMS: Inverter Manufacturer Spec Equipment Cut Sheet - UL 1741)
- g. Additional Generator Specifications

- h. System Test Procedure (Inverter Verification Testing Procedure)
- i. System Disconnect Documentation Attachment.
- j. For Hybrid Systems with Energy Storage Systems:
 - (1) ESS Spec Sheets
 - (2) Utility Process System Operating Characteristics Attachment
 - (3) ESS Charge and Discharge Curve
 - (4) ESS Protection and Controls

8.3.4 If the application is not complete, the Utility shall provide a detailed explanation of the deficiencies and provide a list of additional information needed to the applicant. The Utility shall notify the applicant by email, fax, or other form of written communication.

8.3.5 If the applicant fails to submit all items required or to provide additional information identified by the Utility within forty-five (45) Business Days following the date of the Utility's notification, the application shall be deemed withdrawn and no further action on the part of the Utility is required.

8.3.6 A completed application shall be placed in the Utility's interconnection queue.

8.3.7 If the required documentation is presented in this step, it will allow the Utility to move to step 8.4 and perform the required reviews and allow the process to proceed as expeditiously as possible.

8.3.8 There is a non-refundable application fees of \$1500 due at the time of application submittal.

8.4 The Utility performs a cost estimate for the Utility System Impact Study (USIS)

8.4.1 The Utility shall provide the applicant with an estimate of costs associated with the completion of the USIS within ten (10) Business Days of notification from the applicant.

- a. The applicant may request an optional scoping meeting within fifteen (15) Business Days.

8.5 Applicant commits and pays cost for USIS

- 8.5.1** If the applicant fails to provide the Utility authorization to proceed, USIS fee, and information requested within thirty (30) Business Days of the request, the application shall be removed from the queue and no further action on the part of the Utility is required.

8.6 The Utility completes the USIS

- 8.6.1** The Utility shall complete the USIS within one hundred and twenty (120) Business Days, absent extraordinary circumstances, following a signed USIS agreement, receipt of the USIS fee, and complete information set to complete the study.

- 8.6.2** If the applicant fails to provide the signed USIS agreement, USIS fee, and information requested within thirty (30) Business Days, the interconnection request shall be removed from the queue and no further action on the part of the Utility is required. Upon completion of the USIS, the Utility will provide the following, in writing, to the applicant:

- a. Notification of whether the proposed system meets the applicable criteria considered in the USIS process.
- b. The Utility system impacts, if any.
- c. A description of where the proposed system is not in compliance with these requirements.
- d. Detailed description of reasoning and justification for any system upgrades and associated equipment deemed necessary for interconnection of the project.
- e. A good faith, detailed estimate of the total cost of completion of the interconnection of the proposed system, which is valid for ninety (90) Business Days.

8.7 Applicant Commits to the Utility Construction of Utility's System Modifications.

- 8.7.1** The applicant will provide the Utility with full payment of the Utility's estimated costs within ninety (90) Business Days of receipt. The Utility is not required to procure any equipment or materials associated with the project or begin construction until full payment has been received.
- 8.7.2** If the applicant fails to provide payment within ninety (90) Business Days, the interconnection request shall be removed from the queue and no further action on the part of the Utility is required.
- 8.7.3** Interconnection Construction Kick-Off meeting is scheduled after the applicant makes upgrade payments to discuss and review the following respective specifications:
- a. For 480V Designs, begin Space Allocation Process
 - b. For EO-10215 HTME Designs, Receipt of Signed Con Edison specification (EO-10215)
 - c. For EO-2022 HTV Designs, Receipt of Signed Con Edison specifications (EO-2022 AND EO-2115)

8.8 Interconnection/Agreement Review

- 8.8.1** The Utility and applicant will begin work with the Utility to execute an Interconnection Agreement for the project.

8.9 Project Construction

- 8.9.1** The applicant and the Utility shall collaborate to identify an in-service date and develop a project schedule. The applicant shall build the facility in accordance with the Utility-accepted design and the project schedule. The Utility shall commence construction/installation of system modifications in accordance with the project schedule.
- 8.9.2** For 480V service, construction will follow the signed space allocation drawings and associated specifications.

8.9.3 If the customer is receiving EO-10215 or EO-2022 high tension service, the project will enter an iterative 30%, 60%, and final (90%) design package review. During each milestone the subsequent steps outline the documents required for review and approval.

8.9.4 30% construction documents review/acceptance and site-specific technical design specification sign-off:

- a. One Line Diagram/3-Line Diagram
- b. Signed Copy of EO-2022
- c. Signed Copy of EO-4035
- d. Detailed Design Documents and Specifications
- e. Substation Floor Plan with Room Layouts
- f. Transformer Vault Design
- g. Cable / Conduit Routing
- h. Grounding Plan and Calculations

8.9.5 60% construction documents review/acceptance:

- a. Updated/Revised One-Line Diagram/Three-Line Diagram
- b. AC/DC Control System Schematic
- c. Emergency Generator Details
- d. Battery & Charger Sizing
- e. Grounding System / Grounding Grid Design
- f. Bill of Materials
- g. Short Circuit / Relay Coordination Studies & Protective Relay Settings
- h. Metering Compartment Equipment Details
- i. Equipment Manufacturer Data Sheets

- j. Step and Touch Potential Study
- k. Detailed Design Documents and Specifications
- l. Environmental Report
- m. Geotechnical Report
- n. Builder's Pavement Plan
- o. Flood Elevation
- p. Site Survey

8.9.6 90% design review/acceptance (prior to inspection):

- a. As-Built Diagrams
- b. Updated Protective Relay Settings
- c. Certified Relay Test Reports
- d. Certified Equipment Test Reports
- e. Operating Specifications
- f. Final Design Documents and Specifications

8.9.7 Please note these installations (High Tension and Low tension) are subject to in-progress inspections throughout the construction of the project to ensure compliance to Utility specifications. These inspections will be coordinated by your CPM as needed and will be in consultation with Con Edison's Distribution and Customer Engineering departments.

8.9.8 After the Utility receives, reviews, and accepts the applicant's As-built electrical diagrams and site-specific applicable testing procedures, the applicant can request the Utility to schedule the witness test.

8.10 The Applicant's Facility is Tested in Accordance with the Utility Interconnection Requirements

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- 8.10.1** For EO-2022 HTV interconnections, Pre-Energization Site Inspection & Witness Testing – a multi-day event requiring applicant’s coordination with NETA qualified testing representatives, manufacturers’ field service techs, and the customer’s commissioning agents to demonstrate protection circuits, interlocking, breaker operations, DC control power, and grounding features of the customer’s substation before feeder energization. Utility representatives will witness the testing.
- 8.10.2** Pre-Energization Checklist, including resolution of all punch list items resulting from Utility’s inspections and/or Pre-Energization Witness Testing
- 8.10.3** For EO-10215, EO-2022 HTV and 480V DER interconnections - Outage Scheduling & Facility Energization, Post-Energization Site inspection, and Verification Testing for permission to operate in parallel to the Con Edison electric system.
- 8.10.4** The verification testing shall be performed by the applicant in accordance with the written test procedure(s) provided by the applicant and any site-specific requirements identified by the Utility in step 6 of the Utility Process shown in Exhibit E. The final Verification Testing shall be performed within thirty (30) Business Days of notification to the Utility by the applicant of complete installation at a mutually agreeable time, and the Utility shall witness the test.
- 8.10.5** Final revisions to As-Built drawings, Verification Testing procedure (if applicable), resolution of all punch list items, and mutual acceptance of a site-specific operating & maintenance specification (if applicable)

8.11 Final Acceptance NYISO/FERC Review and Utility Cost Reconciliation

- 8.11.1** Within fifteen (15) Business Days of the completion of the verification testing, the Utility will issue to the applicant either a formal letter of acceptance for interconnection and permission to operate or a detailed explanation of the deficiencies in the system.

- 8.11.2** Within ninety (90) Business Days after issuance of the Utility's formal letter of acceptance, submittal of final as-built drawings to the Utility, or the Project's withdrawal from the queue whichever occurs last, the Utility shall prepare and submit to the applicant a final reconciliation statement of its actual costs less any USIS and construction advance payments made by the applicant.
- 8.11.3** Within thirty (30) Business Days after delivery of the reconciliation statement, the applicant will receive either a bill for any balance due or a reimbursement for overpayment from the Utility as determined by the Utility's reconciliation. The applicant may contest the reconciliation with the Utility. If the Utility's final reconciliation invoice states a balance due from the applicant, unless it is challenged by a formal complaint interposed by the applicant, it shall be paid to the Utility within thirty (30) Business Days or the Utility reserves the right to lock the generating system offline. If the Utility's final reconciliation invoice states a reimbursement for overpayment to be paid by the Utility, unless the reimbursement amount is challenged by a formal complaint interposed by the applicant, it shall be paid to the applicant within thirty (30) Business Days.

9.0 References

EO-2022	General Specification for High Tension service
EO-5051	Design and Construction of 265/480V Transformer Vault and Network Compartments by Contractors
EO-10215	Interconnection Requirements for Distributed Energy Resources (DER) To High Tension Non-Network Distribution
EO-2115	Handbook of General Requirements for Electrical Service to Dispersed Generation Customers
Rates & Tariffs	Rates & Tariffs Con Edison
FERC-OATT	Federal Energy Regulatory Commission Open Access Transmission Tariff

10.0 Exhibits

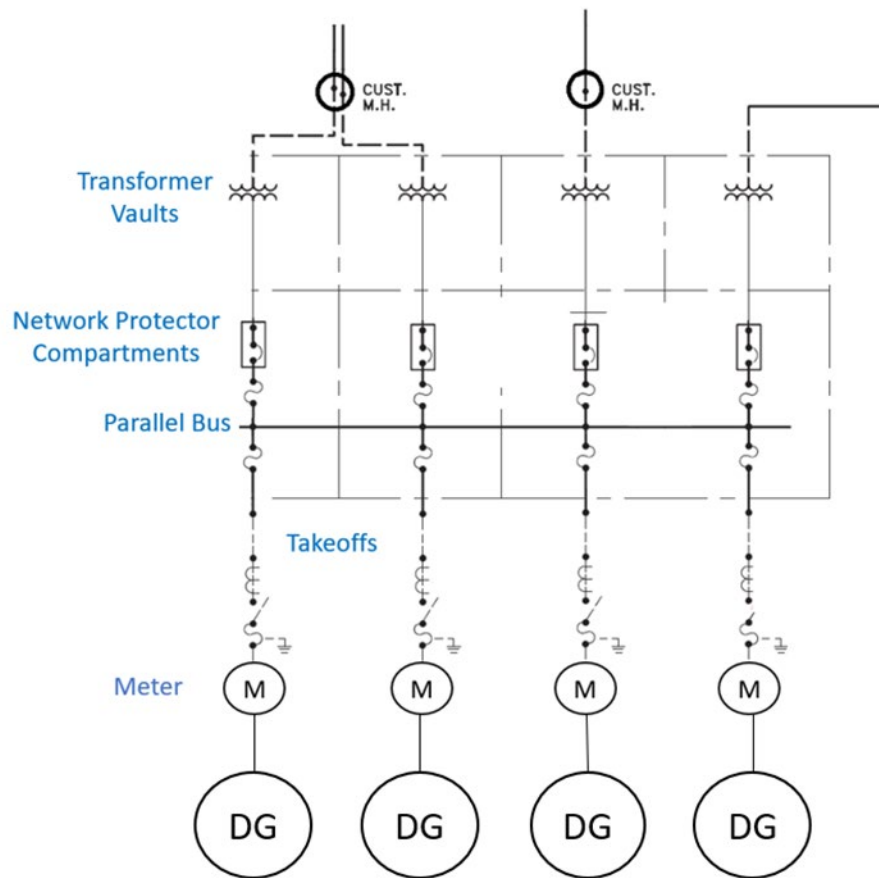
- Exhibit A - Example of a 480V Installation Cover Page
- Exhibit B - Example of a parallel (4) Feeder High Tension Service
- Exhibit C - Example of a High-Tension Non-Network Distribution (EO-10215)
- Exhibit D - Example of interactions between a CPM internal to Con Edison
- Exhibit E – Utility Process

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Exhibit A - Example of a 480V Installation Cover Page

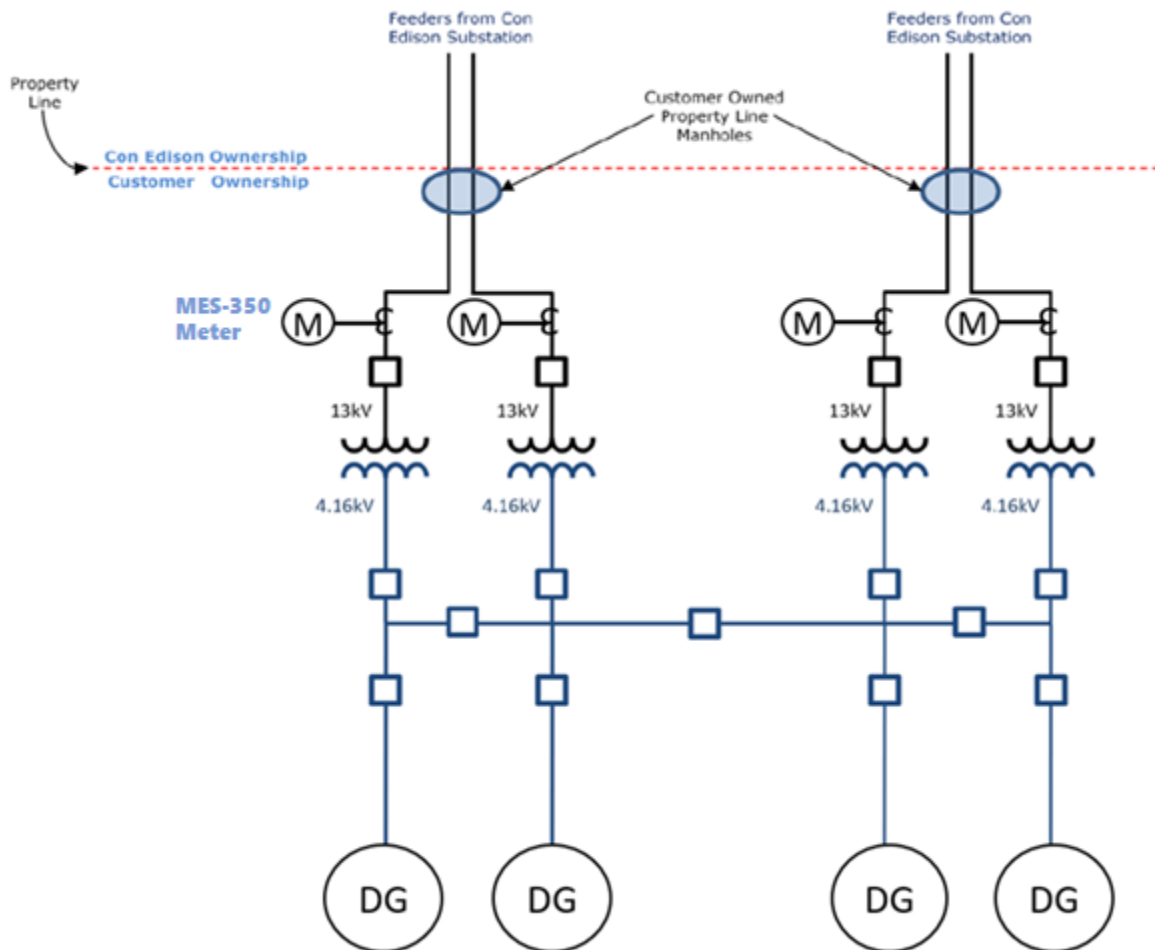


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Exhibit B - Example of a parallel (4) Feeder High Tension Service

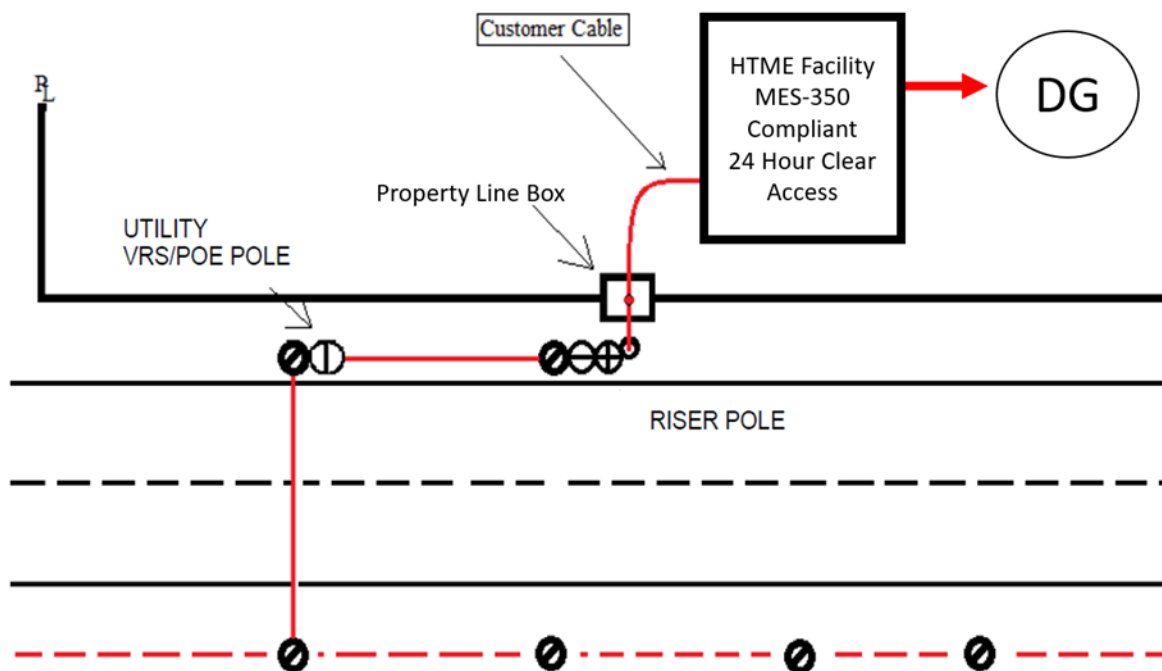


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Exhibit C - Example of a High-Tension Non-Network Distribution (EO-10215)



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Exhibit D - Example of interactions between a CPM internal to Con Edison

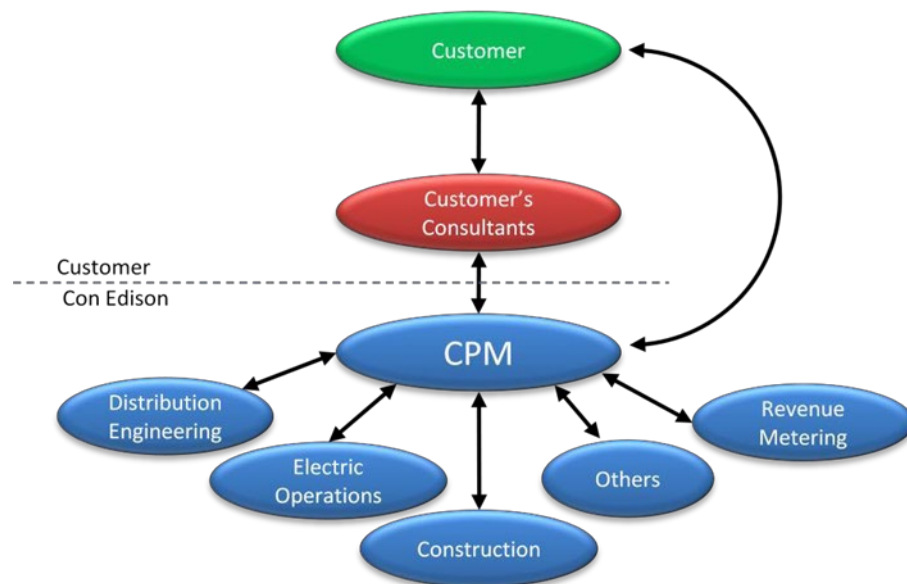


Exhibit E – Utility Process Flow Chart

