

RESOLUTION NO. 2017-66

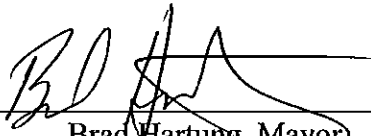
A RESOLUTION AUTHORIZING THE CITY MANAGER TO ENTER INTO A CONSTRUCTION AGREEMENT WITH AMERICAN TRANSMISSION SYSTEM, INCORPORATED (ATSI), SUBSIDIARY OF FIRST ENERGY CORPORATION, FOR THE PROVISION OF THE DESIGN AND INSTALLATION OF AN INTERCONNECTION POINT FOR HURON PUBLIC POWER, IN AN AMOUNT NOT TO EXCEED FIFTY TWO THOUSAND TWO HUNDRED AND 00/100 DOLLARS (\$52,200.00)

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF HURON, OHIO:

SECTION 1. That the Council of the City of Huron authorizes and directs the City Manager to enter into an agreement with ATSI, subsidiary of FirstEnergy Corp., for the provision of the design and installation of an interconnection point for Huron Public Power, in an amount not to exceed Fifty Two Thousand Two Hundred and 00/100 Dollars (\$52,200.00); which shall be in substantially the form of Exhibit "A" attached hereto and made a part hereof.

SECTION 2. That this Council hereby finds and determines that all formal actions relative to the adoption of this Resolution were taken in an open meeting of this Council and that all deliberations of this Council and of its Committees, if any, which resulted in formal action, were taken in meetings open to the public in full compliance with applicable legal requirements, including O.R.C. §121.22.

SECTION 3. That this Resolution shall be in full force and effect from and immediately after its adoption.



Brad Hartung, Mayor

ATTEST: 

Clerk of Council

ADOPTED: SEP 12 2017

**CONSTRUCTION AGREEMENT
BY AND AMONG
AMERICAN TRANSMISSION SYSTEM, INCORPORATED (“ATSI”)
AND
CITY OF HURON, OHIO (“HURON”)**

CONSTRUCTION AGREEMENT

This Construction Agreement (the "Agreement") is made this ____ day of September, 2017 by and among American Transmission System, Incorporated ("ATSI"), a wholly-owned subsidiary of FirstEnergy Corp., and City of Huron, Ohio ("Huron"), each a "Party" and together the "Parties."

WHEREAS, Huron desires to establish and/or modify a wholesale interconnection point with ATSI;

WHEREAS, ATSI has provided to Huron a Detailed Load Study, including an estimated cost for the work to be performed, for the design and installation of a new or modified interconnection point.

NOW, THEREFORE, in view of the mutual undertakings, considerations, and the specific circumstances addressed herein, the Parties hereto agree to the following terms and conditions:

ARTICLE I – DESIGN AND CONSTRUCTION

1.1 Detailed Load Study. The Detailed Load Study under which ATSI will design and install a transmission line tap and related interconnection facilities is attached hereto as Appendix 2.

ARTICLE II – RATES, BILLING AND PAYMENT

2.1 Effective Date. This Agreement shall be effective upon its execution by all the Parties.

2.2 Termination Date. This Agreement shall terminate:

- a) On such date as mutually agreed upon by the Parties; or
- b) Upon thirty (30) calendar days written notice by any Party; or
- c) Upon completion of the construction obligations outlined in this Agreement and the payment of all amounts owed under this Agreement.

2.3 Cost Responsibility. All costs shall be borne by the appropriate Party as identified in Article 1 above and Appendix 2 for the work described therein.

2.4 Cost Estimate. Huron shall reimburse ATSI for actual costs incurred by ATSI to perform the work described in Article 1 above and Appendix 2. These costs include, but are not limited to, all engineering work necessary to determine the design, construction, and operation requirement for the work. ATSI estimates that the cost (excluding taxes) of the work described in Article 1 above and Appendix 2 will be \$106,900, provided that this is a non-binding estimate and the actual costs may be higher.

2.5 Payment. Upon receipt of an invoice from ATSI, Huron shall remit payment to ATSI within thirty (30) days of receiving said invoice as specified in Appendix 1.

- a) Except as described in Section 2.5(b) below, amounts not paid on or before the due date will be payable with interest accrued daily, from the due date until the date upon which payment is made. Interest will be computed at the then current prime rate of interest per annum established by Chase Manhattan Bank, or its successor, on the last business day of the month in which the invoice was rendered, plus one and one-half percent per annum, but in no event greater than the maximum interest rate permitted by law.
- b) Huron reserves the right to dispute in good faith the amount or type of any such costs charged by ATSI. Disputes will be discussed using best efforts to amicably and promptly resolve the disputes. Upon determination of the correct invoice amount, the proper adjustment will be paid or refunded promptly.
- c) Requests for adjustments or refunds regarding any transaction must be made by the requesting Party in writing no later than six months after the date that the invoice was initially rendered.
- d) Within 120 days after either the completion of construction or termination of this Agreement as provided pursuant to Section 2.2 above, ATSI shall provide Huron with a final accounting report of all expenses incurred in performing this Agreement, or in the event of termination, all non-avoidable costs and expenses that ATSI incurred up to the date of termination.
- e) Huron shall have the right, at reasonable times and with ten (10) business days advance notice, to inspect and audit the records of ATSI relevant to all costs incurred by ATSI in connection with the project for two (2) years from the date on which the project was completed. During such two (2) year period, ATSI will maintain all necessary records, including back-up data, for such costs.

2.6 Reconciling Invoice. Within 120 days of completion of construction, in the event actual costs of the project exceed the original invoice payment, ATSI will submit an invoice for any unreimbursed costs. In the event actual costs of the project are less than the original invoice payment, ATSI will, within 120 days of completion of construction, remit a refund to Huron for all unused funds.

2.7 Construction Schedule Estimate. ATSI estimates that the time needed to complete this project is 12 months from the date this Agreement is fully executed, provided that this is a non-binding estimate and the actual time needed to complete this project may be longer.

2.8 In the event that ATSI determines that it is required to file this Agreement with the Federal Energy Regulatory Commission ("FERC") and/or the PJM Interconnection, LLC ("PJM"), Huron agrees to cooperate and support ATSI in obtaining approval of this filing.

ARTICLE III – GENERAL PROVISIONS

3.1 **Notices.** All written notices under this Agreement must be sent by certified mail, return receipt requested, to the persons specified below:

FirstEnergy Service Company
76 South Main Street
Akron, Ohio 44308
Attn: Michael J. Thorn, Agreements Support Manager

With a copy to: FirstEnergy Service Company
Legal Dept.
76 South Main Street
Akron, Ohio 44308
Attn: Attorney, Agreements Support

City of Huron, Ohio
417 Main Street
Huron, Ohio 44839
Attn: Andrew White, City Manager

With a copy to: _____

3.2 **Default.** Default shall mean the failure of a Party to perform any material obligation in the time and manner specified in this Agreement. The Party in Default shall have 30 days from the date of receipt of written notice of Default in which to cure the Default. If the Default is cured within this period, the Default specified in the notice shall cease to exist. A Default that is not so cured, or a Default which is not capable of being cured, shall entitle the Party not in Default to immediately terminate this Agreement.

3.3 **Allocation of Responsibility for Project Activity.**

- a) Each Party shall indemnify and hold harmless the other Party, and the other Party's officers, shareholders, stakeholders, members, managers, representatives, directors, agents and employees, and affiliates, from and

against any and all loss, liability, damage, cost or expense to third parties, including damage and liability for bodily injury to or death of persons, or damage to property or persons (including reasonable attorneys' fees and expenses, litigation costs, consultant fees, investigation fees, sums paid in settlements of claims, penalties or fines imposed under applicable laws and regulations, and any such fees and expenses incurred in enforcing this indemnity or collecting any sums due hereunder) (collectively, "Loss") to the extent arising out of, in connection with, or resulting from the indemnifying Party's breach of any of the representations or warranties made in, or failure of the indemnifying Party or any of its subcontractors to perform any of its obligations under this Agreement, or (ii) the negligence, wanton or willful misconduct of the indemnifying Party or its contractors; provided, however, that no Party shall have any indemnification obligations in respect of any Loss to the extent the Loss results from the negligence or willful misconduct of the Party seeking indemnity.

- b) **Liability.** Except as provided in Section 3.3(a), the liability of a Party for any damages arising out of or resulting from such Party's performance or non-performance of its obligations under this Agreement shall be limited to direct actual damages. No Party will be liable to any other for any indirect, incidental, consequential, punitive, exemplary, or other special damages under this Agreement.

3.4 Force Majeure.

- a) The term "Force Majeure" shall be deemed for the purpose of this Agreement to mean any cause or event beyond the control of the affected Party, including but not restricted to, acts of God, flood, drought, earthquake, storm, fire, lightning, epidemic, war, riot, civil disturbance or disobedience, labor dispute, labor or material shortage, sabotage, acts of public enemy, explosions, orders, regulations or restrictions imposed by governmental, military, or lawfully established civilian authorities, which, in any of the foregoing cases, by exercise of due diligence such party could not reasonably have been expected to avoid, and which, by the exercise of due diligence, it has been unable to overcome. Force Majeure does not include (i) a failure of performance that is due to an affected party's own negligence or intentional wrongdoing; (ii) any removable or remediable causes (other than settlement of a strike or labor dispute) which an affected party fails to remove or remedy within a reasonable time; or (iii) economic hardship of an affected party.
- b) The Party invoking Force Majeure must give prompt notice to the other Parties to this Agreement and shall specifically state the full particulars of the Force Majeure and the time and date when the Force Majeure occurred. Notices given by telephone shall be confirmed in writing as required by Section 3.1 as soon as reasonably possible. When the Force Majeure ceases,

the Party relying thereon must give prompt notice thereof to the other Parties.

- c) No Party is in default of any obligation hereunder, or is liable to the other Parties for any damages, if prevented from fulfilling its obligation by reason of Force Majeure.

3.5 Non-Waiver of Defaults. Any waiver at any time by any Party of its rights with respect to a Default under this Agreement, or with respect to any other matters arising in connection with this Agreement, shall not be deemed a waiver or continuing waiver with respect to any other Default or other matter.

3.6 Written Amendments. This Agreement may be amended, modified, or supplemented only by written agreement of the Parties and, if necessary, acceptance by FERC. Notwithstanding the foregoing, this Agreement shall be amended, as mutually agreed by the Parties, to comply with changes or alterations made necessary by a valid applicable order of any governmental authority having jurisdiction hereof.

3.7 Choice of Laws. Except to the extent that this Agreement is subject to the Federal Power Act, the Agreement shall be governed by and construed in accordance with the laws of the State of Ohio.

3.8 Assignment and Succession. Except as provided in Section 3.8(a) below, no Party shall assign this Agreement or its rights hereunder without the prior written consent of the other Parties, which consent shall not be unreasonably withheld, conditioned, or delayed.

- a) Notwithstanding the foregoing, any Party may, without the need for consent from the other Parties, and without relieving itself from liability hereunder: (a) transfer, pledge, or assign this Agreement as security for any financing with financial institutions; (b) transfer or assign this Agreement to an affiliate of such Party provided that all the persons obligated to fulfill the assigning Party's obligations under this Agreement after the assignment have substantially equivalent financial capability to that of all the persons obligated to fulfill the assigning Party's obligations under this Agreement before the assignment; or (c) transfer or assign this Agreement to any person or entity succeeding to all or substantially all of the assets of such Party; provided, however, that any such assignee shall agree to be bound by the terms and conditions hereof and shall have the financial capability to perform the same.
- b) Upon any assignment made in compliance with this Section 3.8, this Agreement and all its provisions shall inure to and be binding upon the successors and assigns of the assigning Parties.

3.9 If any provision of this Agreement is declared invalid or unenforceable by a court of competent jurisdiction, such declaration shall in no way affect the validity or effectiveness of the other provisions of this Agreement, which shall remain in full force and effect, and the Parties shall thereafter use their best efforts to modify or reform this Agreement so as to

effect the original intent of the Parties as closely as possible with respect to the provisions that were held to be invalid or unenforceable.

3.10 The titles and captions to each of the various sections in this Agreement are included for convenience or reference only and shall have no effect on, or be deemed as part of, the text of this Agreement.

3.11 This Agreement may be executed in any number of counterparts with the same effect as if all Parties had signed the same document. All counterparts shall be construed together and shall constitute one and the same instrument.

3.12 All appendices attached to this Agreement are incorporated into this Agreement as fully as if stated within the body of this Agreement. In the event of a conflict between this Agreement and any exhibits attached hereto, the terms of this Agreement shall control.

3.13 This Agreement, including any appendices and any written amendments expressly made part of this Agreement, shall constitute the entire agreement between the Parties with respect to the subject matter of this Agreement and all prior agreements, representations, and statements with respect to such subject matter are hereby superseded.

3.14 There are no third beneficiaries under this Agreement.

[remainder of page intentionally blank]

[signature page follows]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers as of the day and year above first written.

American Transmission System, Incorporated

City of Huron, Ohio

By: _____

By: _____

Title: _____

Title: City Manager

Date: _____

Date: _____

Approved as to Form:

By: _____

Title: LAW DIRECTOR

Date: _____

Appendix 1

PAYMENT SCHEDULE

<u>Payments</u>	<u>Est. Amount Due</u>	<u>Payment Due Date</u>
Payment #1	\$106,900	Within 30 days of invoice receipt from ATSI
Payment #2	“True-up-costs”	Within 30 days of invoice receipt from ATSI

FirstEnergy

Energy Delivery Transmission Planning and Protection Department

**REVISED
DETAILED LOAD STUDY
REPORT**

A 69kV Transmission Connection Point

For

**Huron Public Power
Huron Corporate Park, Rye Beach Road, Huron, Ohio
Substation Site**

Transmission Connection Request ID. No. 2995

Report Issued: August 23, 2017

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1.0 Executive Summary

This DLS study and report is a revision of the DLS report issued on November 08, 2016 under DLS ID# 2995 and will supersede any previous reports.

This project is to construct a 69kV tap and line extension to the new Huron Public Power Substation, located at Huron Corporate Park Rye Beach Road, Huron, Ohio 44839. The tap will start near or at Structure 200/201 on Greenfield-Shinrock 69kV line and extend approximately 0.1 miles south to the Customer substation.

See **Appendix B** for the geographic location of the connection point in relationship to the ATSI transmission system.

The proposed in-service date is September 01, 2018.

The DLS study and report identified no thermal and voltage criteria violations on ATSI transmission system caused by the addition of the Huron Public Power new connection point and its 22MVA load in 2018.

The DLS was performed by FE's Energy Delivery Planning & Protection (EDPP) group, with assistance from Substation Design, Transmission Line Design, Metering Technical Support, and Wholesale Agreement Support.

Please note that if Huron Public Power should significantly change their substation configuration or increase their required load above 1MVA after their in-service date for this interconnection, then additional study will need to be performed by FE.

The results of this study report are subject to change. This study is based upon the current configuration of the FE System and includes only those proposed Delivery Point projects with signed Delivery Point agreements. Delivery Point agreements executed subsequent to the completion of this study may impact the study results and cause the study to be performed again at the Applicant's cost. FE will use best efforts to inform Applicants should this occur.

2.0 Huron Public Power

2.1 Huron Public Power substation-Background

Huron Public Power proposed to build 69/12.47kV substation in Huron, OH 44839. The substation will be served from ATSI Greenfield-Shinrock 69kV line. The new substation will serve 22MVA load in 2018 and a forecasted 30MVA load in 2019/2020. The customer load is served by two 69/12.47kV transformers, each with a rating of 15MVA. The transformers will be connected in delta-grounded wye. Both transformers will have automatic load tap changers. Huron Public Power is solely responsible to build the proposed substation and the extension line from the agreed point of interconnection (POI) to proposed substation.

Note: See **Appendix C.3** of this report for the proposed Huron Public Power Substation one-line diagram, provided by Huron Public Power.

3.0 Scope of Study

This study and report fulfills the Detailed Load Study (DLS) Agreement between FirstEnergy (FE) and the Huron Public Power (Customer) that was made August 17, 2015. The results of the study are provided within this report and include a detailed cost estimate (+/- 20%) and engineering and construction schedule to complete the required FirstEnergy transmission system modifications needed to accommodate this transmission connection request.

The scope of this study includes:

1. A summary of the study performed of the FirstEnergy system to accommodate an initial 22MVA of load in 2018 served from the Greenfield-Shinrock 69kV line.
2. Requirements to facilitate the 69kV line extension and connecting the Huron Public Power facilities to the FE transmission system. This includes the standard equipment requirements and configuration on the FE and Customer side on the connection.
3. Short circuit level at the defined Point of Interconnection (POI).

The report provides a description of the system operating and protection requirements, revenue metering requirements, transmission switch specifications, and a statement regarding harmonics.

4.0 Methodology

4.1 Case Description

The power flow models used to perform load flow analysis were developed from the North American Electric Reliability Corporation (NERC) / Multi-regional Modeling Working Group (MMWG) model, and include the added detail of the FE transmission system. The new delivery point and load connection to the FE transmission system was modeled using the detailed FirstEnergy 2018 summer peak load flow base case (load plus losses at 13,089MW). This power flow model was derived from the 2015 SERIES ERAG/MMWG base cases.

4.2 Analysis performed / Tools Used

The power flow analysis was performed using GE's Positive Sequence Load Flow (PSLF) program. The power flow analysis that was completed evaluated the existing system capacities for all system elements intact (N-0), as well as select area contingencies that removed transmission line sections and transformers from service (N-1 and N-2 conditions). This analysis was done with and without the proposed Customer load addition. The results of the load flow analysis were compared against the FirstEnergy Transmission Planning Criteria. Any planning criteria thermal loading or voltage violations were reported.

The acceptable thermal and voltage criteria can be found in the FirstEnergy Transmission Planning Criteria document which is referenced in the 'Additional Resources' section in the **Appendix E** of this report.

4.3 Options Considered

There are two FE transmission lines within 2.5 miles of the proposed Customer substation. Greenfield-Shinrock 69kV line is approximately 0.1 miles south of the proposed Customer substation and the Beaver-Nasa 138kV line is approximately 2.2 miles west of the proposed Customer substation.

Huron public power requested an interconnection from the Greenfield-Shinrock 69kV line and was the only option considered to serve the Customer load.

5.0 Customer Load connection

The proposed Customer substation will be served from the Greenfield-Shinrock 69kV tap line. The Customer substation will be connected to the Greenfield-Shinrock 69V line by a line extension of approximately 705 feet of 336Kcmil ACSR conductor from a single pole tap structure. The line extension will terminate on a FirstEnergy approved, Customer owned, take-off structure just inside/outside of the Customer substation. There will be a motor operated switches at the line tap location on the Greenfield-Shinrock 69kV line and a gang operated switch at the POI on the Customer's take-off structure. The FE switch leading towards the Greenfield substation will be equipped with a vacuum bottle interrupting device for the purpose of breaking loop current and the FE switch leading towards the Shinrock substation will have whips.

The Customer has the option to request SCADA control for the FE line sectionalizing switches on the Greenfield-Shinrock 69kV line for the purpose of increased reliability. If the Customer chooses to do so, SCADA control will be added to the required switches at the Customer's expense. This addition would allow remote operation from the System Control Center (SCC).

See **Appendix C.1** of this report for the proposed Huron Public Power delivery point interconnection
See **Appendix C.2** of this report for the FE standard tap line load connection.

6.0 Results

6.1 Load Flow Study Results

Service to the proposed Customer delivery point was considered from the 69kV system via the Greenfield-Shinrock 69kV Line. Different load levels were modeled at the proposed site for varying study years. The analysis shows that neither the initial load level of 22MVA in 2018, nor the proposed forecasted load level of 30MVA in 2019/2020 results in any new thermal overloads or low voltage criteria violations for base or contingency conditions. This DLS report is for the initial load of 22MVA in 2018.

Please note that if Huron Public Power should significantly change their substation configuration or increase their requested load above the initial 22MVA load (greater than a 1MVA increase) after the in-service date for this interconnection, then an additional study will need to be performed by FE to evaluate the load increase and system conditions.

7.0 System Operation and Protection

7.1 Protection Requirements

The proposed Customer substation will be served from the Greenfield-Shinrock 69kV line. It is understood that the proposed Huron Public Power substation will consist of two (2) delta-wye grounded transformer tapped to the existing Greenfield-Shinrock 69kV line through a 69kV circuit breaker. The proposed substation will be protected by a 1200A continuous and 40kA momentary current rated circuit breaker. Under this proposal, the existing protection on the Greenfield-Shinrock 69kV line is adequate.

It is understood that there is no Customer generation to be installed at this location. Thus, it has been determined that generation inter-tie protection is not required. If generation facilities are installed at a future date, then an additional application, study, and revised direct connection requirements would be necessary.

It is required that Huron Public Power send the finalized substation one-line to FE for approval prior to the start of detailed engineering and at least 90 days prior to the planned in-service date to allow sufficient

review time. The 69kV metering **MUST** be within the local zone of protection, not before. For the new substation, a protective device will be required before the metering.

Upon completion of the installation, FE personnel will complete a substation checkout. The procedure will include verifying installation, ratings, and tests of the major power equipment connecting to the FE transmission line and connections and settings of the transformer-related protective relays. FE personnel will witness any functional testing performed, which will need to be coordinated in advance with FE by the Customer.

Huron Public Power is solely responsible for protecting its own equipment in such a manner that electrical faults or other disturbances on the FE system do not damage its equipment. All proposed load serving delivery points must comply with the technical requirements detailed in the document, "Requirements for Transmission Connected Facilities ", in which a link can be found in **Appendix E** of this report.

7.2 Short Circuit Data and Protective Device

The short circuit levels at the Customer 69kV bus are the following:

Short Circuit values at 69kV

Three phase fault = 8200A, 980MVA.
Single line to ground fault = 5840A.

System Impedances at 69kV, 100 MVA

Positive sequence $Z1 = (3.10 + j9.39) \%$
Zero sequence $Z0 = (7.76 + j20.48) \%$

The fault currents provided are bolted, symmetrical values for present, normal system conditions. Future increases in fault currents are possible and it is the Customer's responsibility to upgrade their equipment and/or protective equipment coordination when necessary.

7.3 Transmission Line Switches

The Customer 69kV delivery point will require three 1200A motor operated switches. A motor operated switch will be installed on each side of the tap and gang operated switch will be installed on the Customer tap side. The switch toward Greenfield Substation will be equipped with vacuum bottle interrupting device for the purpose of breaking loop current.

7.4 Metering Requirements

Revenue metering shall be installed on the primary side of the Customer's 69kV step-down transformer, on the load side of the fault-interrupting device, and within the local zone of fault protection of the facility. FE will provide the following equipment:

- Two (2) 69 kV CT's
- Two (2) 69 kV VT's two-bushing (no primary fuse)
- CT/VT secondary cable
- 5S meter socket enclosure with test switch
- Electronic interval meter with Ethernet port (for connection to AMP's satellite communication equipment)

FE will pull and terminate the secondary cable between the instrument transformers and the meter. The Customer is responsible for installing the CT's, VT's, and socket enclosure. The Customer must also

provide and install the associated steel conduits and VT secondary junction box with circuit breaker and disconnect switch. For detail see the *FirstEnergy Revenue Metering Installation Requirements for Transmission Connected Retail and Wholesale Load Customer Facilities* in the *FirstEnergy Requirements for Transmission Connected Facility* document.

7.5 Supervisory Control and Data Acquisition (SCADA)

Operational metering through the use of SCADA of the Customer's analog values (MW, MVAR and Voltage) is not required for the interconnection. If the Customer is installing an RTU (remote terminal unit) and wishes to have it monitored by the FE System Control Center, additional communications requirements would be mandated so as to adhere to FE standard engineering practices (frame relay, circuit, router, etc....). The Customer has an option to request SCADA for operational metering and FE line switches. The additional SCADA cost would be the Customer's responsibility.

7.6 Voltage Supply

The customer facility will be supplied from FE's 69kV sub-transmission system, which is designed to operate between 90.0% to 105.0% of the nominal 69kV voltage under normal and single transmission element outage conditions. If the customer supply voltage requirements are more restrictive than the voltage range between 90.0% to 105.0% of the nominal 69kV voltage, FE recommends that the customer consider the addition of voltage regulation equipment in its facility. Under certain emergency condition involving multiple system contingency, the FE transmission system may operate for a period time outside of this range.

7.7 Load Power Factor Requirement

The customer connected to the FE Transmission System should plan and design their systems to operate at close to unity power factor to minimize the reactive power burden on FE Transmission System. The FE requirement for close to unity power factor is that the power factor at the point of interconnection shall be controlled to be within the range of 0.97 lagging to 0.99 leading.

8.0 Power Quality Requirements

The customer confirmed that there will not be any non-confirming load (Harmonic or flicker producing loads) that may significantly impact the FirstEnergy system. FE doesn't expect power quality issue due to the customer loads. However, the customer shall adhere to the FE power quality criteria which can be found in the FirstEnergy Transmission Planning Criteria document which is referenced in the 'Additional Resources' section in the **Appendix E** of this report.

8.1 Harmonic Injection Levels

The Customer must ensure that harmonic injection levels are limited to levels specified in the most recent version of the IEEE 519 requirements. If required by FirstEnergy, harmonic measurements should be taken at the Customer substation after the facility is in service to assure compliance.

8.2 Voltage Flicker

Voltage flicker for infrequent events such as large motor starting will be evaluated based upon the resulting percent voltage dip per event (see Annex A of IEEE Std. 1453-2004). In no case shall the resulting percent voltage dip per motor starting event exceed 3% on the FE transmission system.

9.0 Siting/Licensing - OPSB LON

The 69kV tap connection point and line extension to the Customer substation does not require that a Letter of Notification (LON) filing be made with the Ohio Power Siting Board (OPSB). The LON Requirement do not apply since the design capacity of the new line is less than 125kV.

10.0 Scope of Direct Connection and Reinforcement Work

10.1 Scope of Direct connection

The proposed Customer substation will be served from the Greenfield-Shinrock 69kV line. A single-pole tap structure is required. The Customer substation will be connected to the Greenfield-Shinrock 69V line by approximately 705-foot 336kcmil ACSR conductor 69kV line extension from the Greenfield-Shinrock 69kv line. The line extension will terminate on a FirstEnergy approved, Customer owned, take-off structure just outside of the Customer substation. There will be a motor operated switches at the line tap location on the Greenfield-Shinrock 69kV line and a gang operated switch at the POI on the Customer's take-off structure. The FE switch leading towards the Greenfield substation will be equipped with a vacuum bottle interrupting device for the purpose of breaking loop current and the FE switch leading towards the Shinrock substation will have whips

The Customer has the option to request SCADA control for the FE line sectionalizing switches on the Greenfield-Shinrock 69kV line for the purpose of increased reliability. If the Customer chooses to do so, SCADA control will be added to the required switches at the Customer's expense. This addition would allow remote operation from the System Control Center (SCC).

10.2 Scope of Reinforcement work

There are no system reinforcements beyond the direct connection facilities (69kV line extension, switches and single pole structure) required on the FirstEnergy transmission system to accommodate this load connection request.

11.0 Schedule

The anticipated schedule for the design and construction of the connection facilities and system modifications is estimated to be 12 months after the signing of the agreement. This schedule assumes no outage, siting or right-of-way acquisition conflicts. The transmission line siting assumes the following: that minimal wetlands, streams or ecological features are in the project area and will not significantly impact the schedule.

This estimate assumes authorization to start engineering is granted by 10/1/2017. The exact substation location and details are required in order to start line engineering. The schedule assumes that there are no outage, right-of-way, or permitting issues. Note that outages are difficult to obtain during peak summer load months and the construction schedule could be impacted. The exact substation location and property has not yet been provided. It is assumed that the Customer substation property will encompass all of the transmission line work. The Customer must agree to an alignment such that no danger tree rights will be required from adjacent property owners(s). If not, the ROW costs will be increase and possibly the project duration

12.0 Cost Analysis

The total cost of The Huron Public Power load connection request is \$106,900, excluding taxes. The cost estimate includes the optional SCADA control for the main line switches. The total Customer cost without the SCADA control is \$52,200, excluding taxes.

Huron Public Power Interconnection Estimated Project Cost without Tax (Customer portion)		
Item No	Scope of Work Description	Cost Estimate
1	Install SCADA control for the main line switches ¹	\$33,900
2	Install Revenue Metering at the Customer Substation ²	\$41,000
3	Engineering Oversight and Commissioning	\$32,000
Total Project Estimated Cost		\$106,900

¹SCADA control is optional

²The cost to install a revenue metering is part of the FE-AMP rate agreement. It is included here to show the total Customer cost for the project.

Note: The cost estimate includes Project Management, Environmental and Commissioning. It does not include tax gross-up, permitting, or additional right of way (if required).

13.0 Conclusion and Recommendation(s)

The 22MVA load can be served by the Greenfield-Shinrock 69kV line without causing any reliability issues or violating thermal/voltage criteria on the FirstEnergy system. The anticipated schedule for the design and construction of the connection facilities and system modifications is estimated to be 12 months after the signing of the Line Extension Agreement. This schedule assumes no outage, siting or right-of-way acquisition conflicts. The transmission line siting assumes the following: that minimal wetlands, streams or ecological features are in the project area and will not significantly impact the schedule.

The total cost of The Huron Public Power load connection request is \$106,900, excluding taxes. The cost estimate includes the optional SCADA control for the main line switches. The total Customer cost without the SCADA control is \$52,200, excluding taxes.

Huron Public Power is responsible for the design, purchase, installation, maintenance, and cost of the equipment leading up to the defined POI at their facility (Appendix C). Since Huron Public Power is responsible for this portion of the project, the associated cost estimates and schedules are not included within this report.

Berhanu Bedada
Transmission Planning

Thuong Nguyen
Transmission Protection

Appendix A

Huron Public Power

Summary of Load / Generator Connection

June 06, 2016

FE Operating Company: Ohio Edison Operating Company Division: Akron Division

Applicant Information

Company / Customer Name: Huron Public Power, 69kV

Connection Category (Retail / Wholesale): Wholesale Application Number: 2995

Facility Address: University Dr. East/ Huron Corporate Park

City: Huron State: OH Zip: 44839 County: Erie

Nearest Intersection: Bogart Road and Rye Beach Road

Customer Connection Request

Requested In-Service Date: 08/01/2018

Connection Type: Load

Load Information

Existing Load: 0.4 MVA @ 98.0 % PF

Load Request #1: 22 MVA @ 98.0 % PF

Requested Date: 08/01/2018

Load Request #2: 30 MVA @ 98.0 % PF

Requested Date: 2019/2020

Load Request #3: MVA @ % PF

Requested Date:

Generation Information

Existing Gen: 0 MW

Gen Request #1: 0 MW

Requested Date:

Gen Request #2: 0

Requested Date:

Gen Request #3: 0

Requested Date:

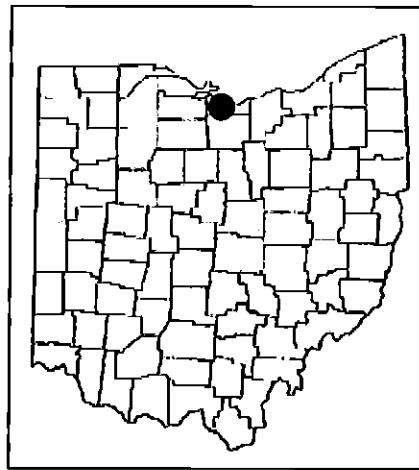
Connection Options

1) Transmission Facility Name: Greenfield-Shinrock 69 kV

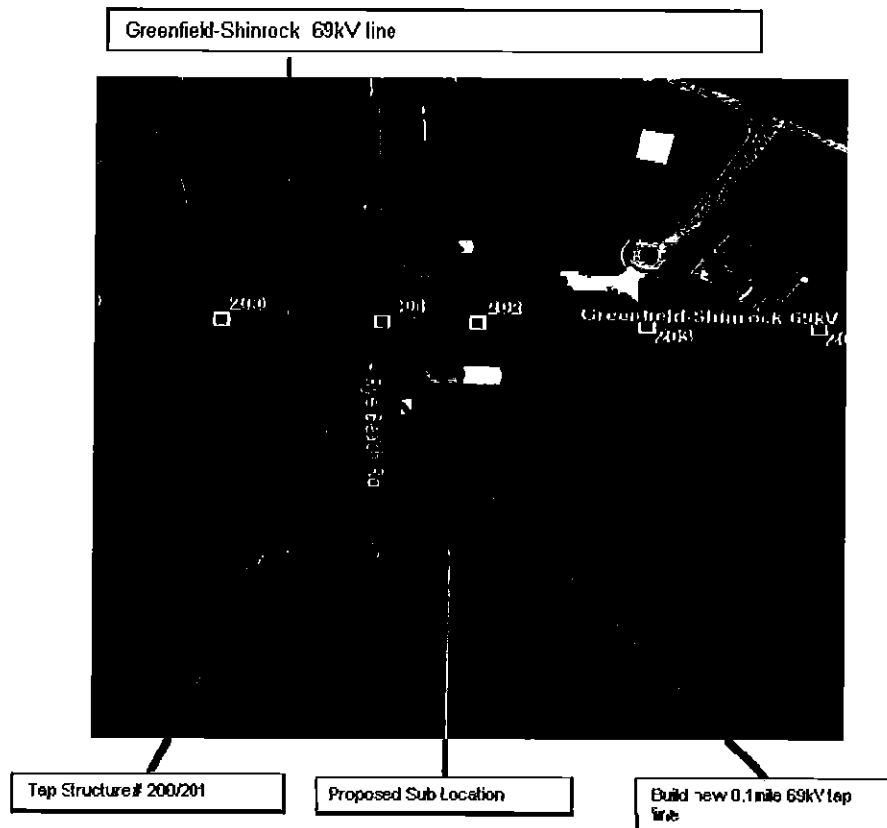
2) Transmission Facility Name: kV

Appendix B

Geographical Location

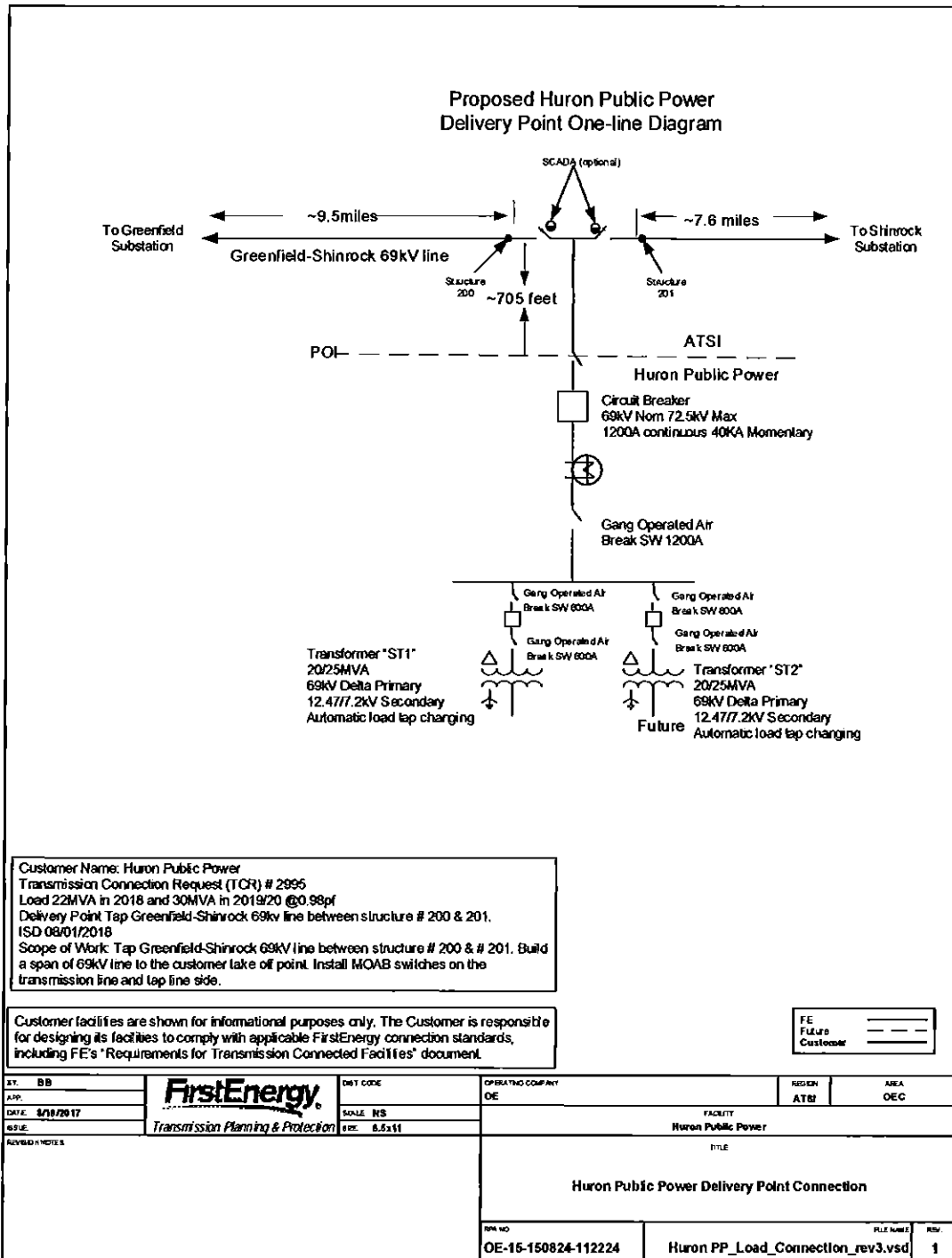


Proposed substation geographical location



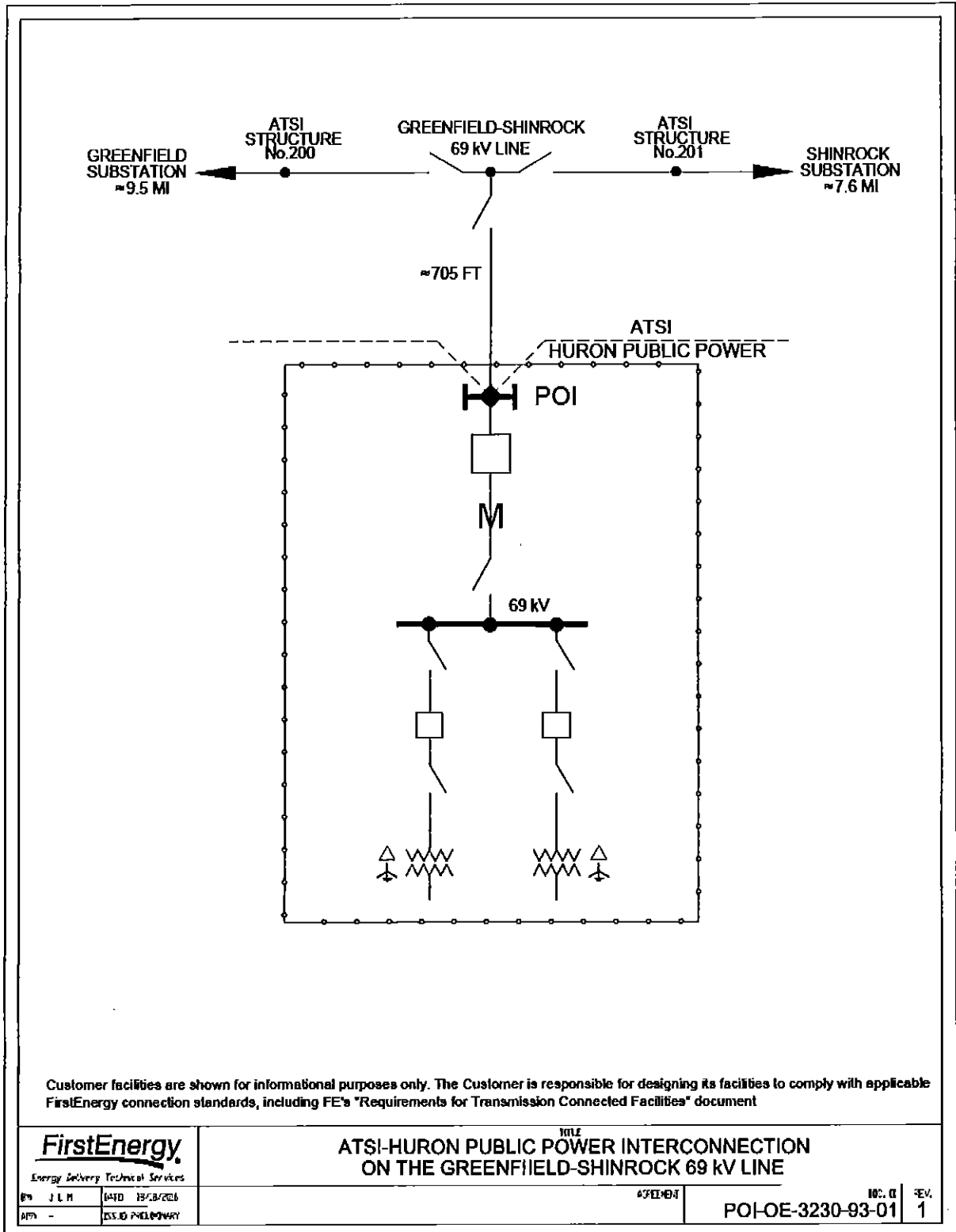
Appendix C.1

One-Line Diagram



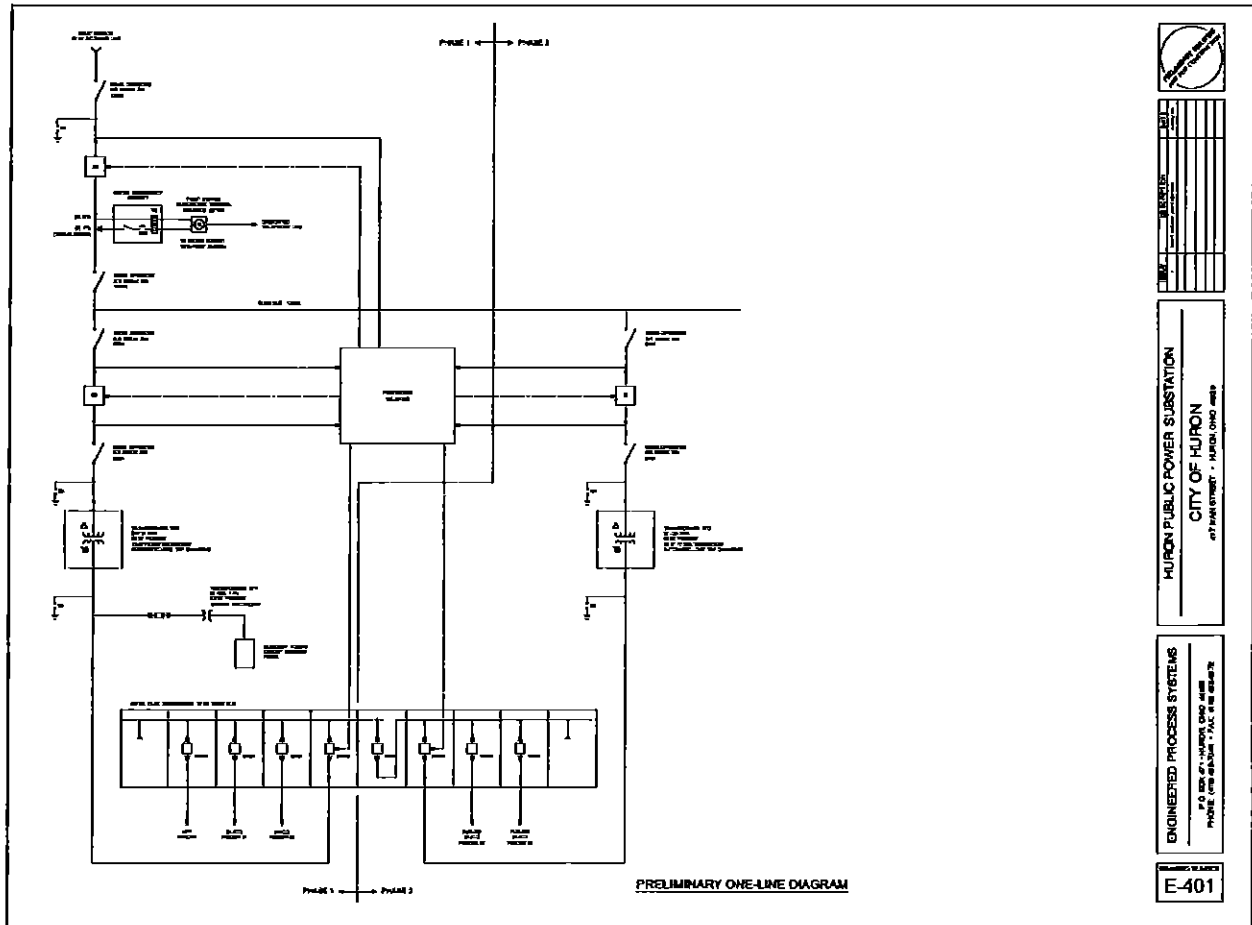
Appendix C.2

FE standard tapped line load connection One-Line Diagram



Appendix C.3

Proposed Huron substation One-Line Diagram-provided by Huron Public Power



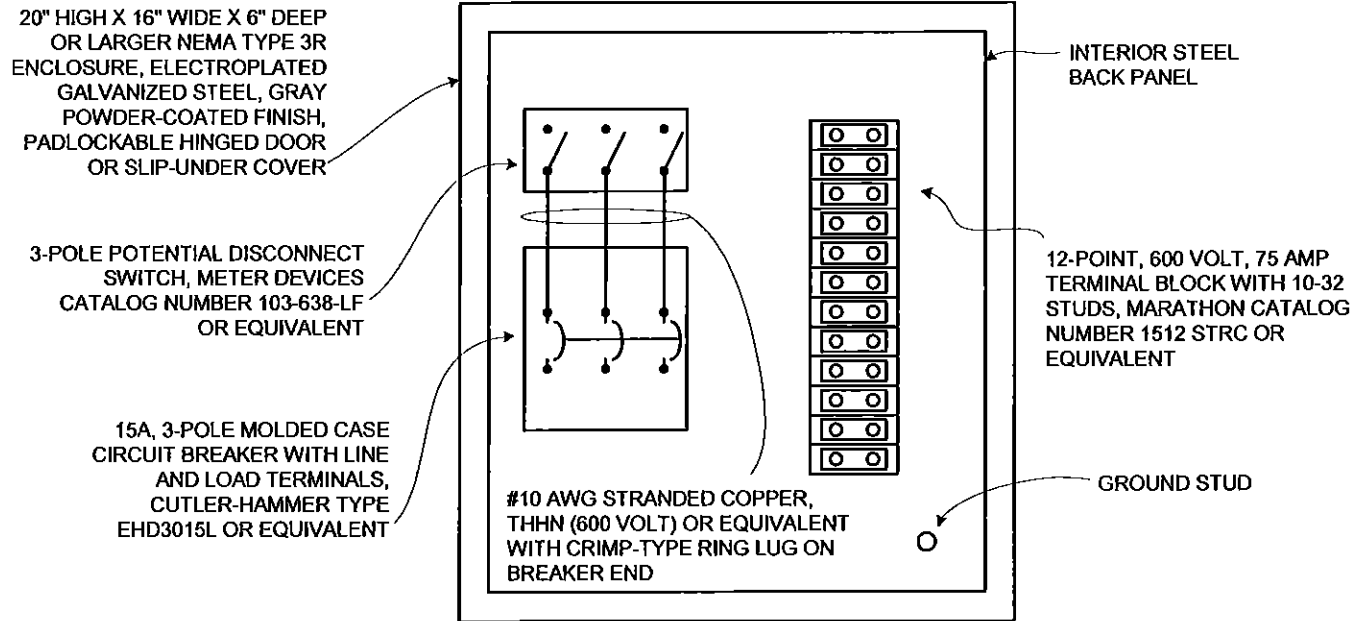
Appendix D

FirstEnergy Revenue Metering Installation Requirements for Transmission Connected Retail and Wholesale Load Customer Facilities

- This document is intended to address detailed revenue metering installation requirements for transmission connected retail and wholesale load Customer facilities. These requirements are in addition to the revenue metering requirements outlined in the FirstEnergy (FE) “Requirements for Transmission Connected Facilities” and the detailed load study reports.
- After applying for connection to the FE transmission system, the Customer shall consult with the FE Transmission Planning engineer and the FE Central Electric Lab to determine the appropriate revenue metering installation design. The Customer must provide FE with detailed facility information including the proposed substation one line, substation layout, expected loads (initial and future), and required in-service date to ensure proper specification of metering equipment. It is critical for this information to be provided as early in the Customer facility design phase as possible so that FE has a reasonable period of time to purchase and install the metering equipment prior to the in-service date.
- The local FE Operating Company (FEOC) will furnish and maintain the revenue metering equipment for each transmission connected retail or wholesale Customer facility as specified in the electric service tariff or service agreement. The metering equipment furnished and maintained by the FEOC includes, but is not limited to, the instrument transformers, secondary wires, meter(s), and meter socket(s). The Customer shall provide at its own expense the space, structures, enclosures, and conduits necessary for the metering installation. The Customer is responsible for mounting the instrument transformers, conduits, enclosures, and meter socket(s).
- The FEOC will provide and install the secondary wiring between the instrument transformers and the meter socket(s). The Customer may pull the wiring through the conduit if requested by the FEOC.
- If the metering will be connected to a system voltage rated 69kV or higher, then the Customer shall provide, install, and maintain a padlockable weatherproof enclosure containing a three-pole circuit breaker and a three-pole potential disconnect switch for connection to the voltage transformer secondary wires. The enclosure shall include a 12-point terminal block with 10-32 studs for termination of voltage and/or current transformer secondary wires. See the figure below for device details and general arrangement. The enclosure shall be mounted in a readily accessible location below the instrument transformers and shall be used for FE wiring only. The enclosure shall be secured with a FE-owned padlock. This enclosure may in some cases be required for metering connected to a system voltage rated 34.5kV or 46kV.

ENCLOSURE FOR METERING SECONDARY VOLTAGE/CURRENT CONNECTIONS

(FRONT VIEW WITH DOOR OR COVER REMOVED)



- Instrument transformers must be readily accessible to authorized FEOC representatives for secondary wiring installation. Location of transformers shall be such that the heights of transformer bases do not exceed 20 feet above grade.
- Conduit shall be 1-1/2 inch galvanized rigid steel conduit. Flexible galvanized steel (liquid tight) conduit may be used between instrument transformers.
- Meter sockets shall be installed in readily accessible locations approved by the FEOC Meter Services section. This includes locations inside the substation if authorized FEOC representatives can gain access by use of a standard FEOC lock or, if the FEOC will permit, by contacting a Customer representative who is capable of providing access within a reasonable time period.
- The meter socket(s) shall be installed by the Customer generally within 50 feet of the instrument transformers unless an alternate design has been approved by the FEOC Meter Services section.
- A meter socket shall be mounted such that the centerline of the meter is approximately five feet above final grade.
- When applicable, the Customer shall provide, at its sole cost and expense, the installation, operation, and maintenance of the required communication link(s) for the FE billing meter data collection system (MV-90). The specifications for the typical telephone communication link are as follows:
 - Standard voice grade (analog) with dial tone. No digital telephone line(s) permitted.
 - Two-pair or four-conductor with RJ-11 / Male termination. FEOC will make final connection to the meter.

- Must be able to receive in-coming calls.
 - Must be direct line to meter, with no operator interception or operation required.
 - Install telephone line and associated conduit between telephone company source and meter socket or enclosure.
 - Telephone line must be tagged with phone number, including area code.
 - Telephone line must be installed and operational prior to the Customer's service being energized.
- Where vehicle traffic may interfere with or damage metering equipment, the Customer must install concrete filled steel barrier posts to protect such equipment.
 - Before the metering equipment installation is started, the Customer/contractor must contact the FE Central Electric Lab to coordinate installation details, material delivery, and construction schedule.

Appendix E

Additional Resources

FirstEnergy, Energy Delivery Planning & Protection "**Requirements For Transmission Connected Facilities**" – describes in detail the full requirements for Customers connecting to the FE transmission and sub-transmission systems.

Available online at <https://www.firstenergycorp.com/content/dam/feconnect/files/wholesale/Requirements-for-Transmission-Connected-Facilities-10-03-2016.pdf>

FirstEnergy "**Transmission Planning Criteria**" – describes in detail the system thermal and voltage criteria, planning process, conditions for various contingencies, and some equipment standards.

Available online at <https://www.firstenergycorp.com/content/dam/feconnect/files/wholesale/FEC-Planning-Criteria.pdf>

Appendix F

Project Cost Breakdown

I. Total Estimated Customer Cost

Huron Public Power Interconnection Estimated Project Cost without Tax (Customer portion)		
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